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FIRST SEMI-ANNUAL 2016 GROUNDWATER MONITORING AND CAP INSPECTION REPORT

BNSF Glacier Park East
Leavenworth, Washington

Prepared for:

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

Prepared by:

TRC

August 2016

FIRST SEMI-ANNUAL 2016 GROUNDWATER MONITORING AND CAP INSPECTION REPORT

August 15, 2016

BNSF Glacier Park East
Leavenworth, Washington

TRC Project No. 230814

Prepared For:

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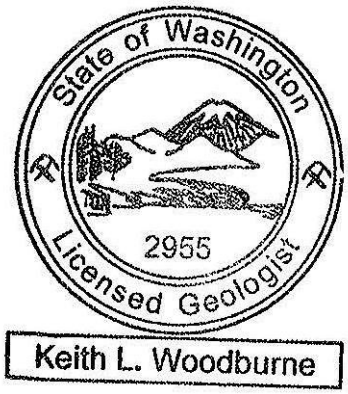

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1.0 INTRODUCTION

This first semi-annual 2016 groundwater monitoring report has been prepared on behalf of BNSF Railway Company (BNSF) to document the results of the groundwater monitoring conducted by TRC at the Glacier Park East site (Site; Figure 1) in Leavenworth, Washington. The Site is located northeast of the intersection of U. S. Highway 2 and Chumstick Highway (formerly State Route 209). The groundwater monitoring event and cap inspection was completed on June 1, 2016.

The purpose of the groundwater monitoring event was to evaluate the nature and extent of hazardous substances detected above Washington State Department of Ecology (Ecology) Model Toxic Control Act (MTCA) Method A cleanup level (Ecology, 2013). 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 gasoline-range organics (GRO), diesel-range organics (DRO) and oil-range organics (ORO); and
- Benzene, toluene, ethylbenzene, and total xylenes (BTEX).

In addition, this report includes a summary of the inspection of the cap and associated drainage system. Cleanup activities at the Glacier Park East site were conducted under Agreed Order No. DE 01TCPCR-3168 entered into with Ecology in 2001. The approved cleanup actions consisted of isolating soil contamination and monitoring groundwater.

2.0 GROUNDWATER MONITORING ACTIVITIES

On June 1, 2016, TRC recorded groundwater elevations from five (5) monitoring wells and collected groundwater samples from three (3) of the monitoring wells (MW-2, MW-3 and MW-4). The locations of the monitoring wells are shown in Figure 2. Samples were collected by bladder pump with disposable polyethylene bladder and new skip bonded polyethylene tubing using low-flow purging and sampling procedures. TRC recorded the dissolved oxygen (DO), pH, temperature, conductivity, turbidity, and oxidation reduction potential (ORP) using a YSI multi-meter and flow-through cell and Hach turbidity meter. Following parameter stabilization, the discharge tubing was disconnected from the flow-through cell and the samples were collected and immediately placed on ice. The bladder pump was disassembled and decontaminated and the disposable bladder was replaced between each sampling location.

General groundwater gauging and low flow sample collection procedures are provided in Appendix A.

The groundwater samples were submitted to ESC Lab Sciences of Mt. Juliet, Tennessee for analysis of the following COPCs:

- DRO and ORO by Northwest Method NWTPH-Dx;
- GRO by Northwest Method NWTPH-Gx; and
- BTEX by United States Environmental Protection Agency (EPA) Method 8021B.

Copies of the laboratory analytical reports and chain-of-custody documentation are provided in Appendix B.

3.0 GROUNDWATER MONITORING RESULTS

3.1 Groundwater Elevations

Groundwater elevations increased by an average of approximately 4.5 feet from the average groundwater elevations at the site (Table 1). During the June 2016 monitoring event, groundwater elevations ranged from 1089.19 feet above mean sea level (amsl) at monitoring well MW-5 to 1093.41 feet amsl at MW-3. Monitoring well MW-5 appears to have been installed in a less permeable silt as compared to lithologies observed at depth during installation of other site wells (GeoEngineers, 2001). As a result, monitoring well MW-5 was excluded from the groundwater flow direction and gradient calculation due to a significantly lower groundwater elevation compared to other site monitoring wells and it is assumed MW-5 is not hydraulically connected to the other four site wells.

The groundwater flow direction determined from the June 1, 2016 monitoring event is generally to the northeast, away from the Wenatchee River (Figure 3) and not consistent with previous monitoring events at the Site during which groundwater flow direction has been more consistently to the east-southeast and southeast (Figure 4). The groundwater gradient was consistent throughout the Site, with an approximate gradient of 0.008.

3.2 Constituents of Potential Concern

During the first semi-annual 2016 monitoring event, the following concentrations were reported and trends observed in Site monitoring wells:

- GRO concentrations in groundwater during this monitoring event ranged from non-detect to 370 micrograms per liter (µg/L), all below the MTCA Method A cleanup level of 800 µg/L. GRO concentrations in wells MW-2 and MW-3 have fluctuated over the period of record (October 2001 through June 2016). GRO concentrations in well MW-2 have previously shown a clear decreasing trend since March 2012, and with the exception of this event, have remained below the laboratory reporting limit of 100 µg/L since December 2012. GRO concentrations in well MW-3 have generally declined since December 2012 with only one reported concentration in December 2013 above the MTCA Method A cleanup level of 800 µg/L and an increase in concentration during the previous event to 471 µg/L. GRO concentrations in well MW-4 exhibited generally decreasing trends between 2003 and 2010, and with the exception of a spike of 140 µg/L in October 2011, concentrations have remained below laboratory reporting limits and well below the MTCA Method A cleanup level of 800 µg/L for GRO.
- DRO concentrations in groundwater during this monitoring event ranged from 554 µg/L to 1,700 µg/L. The DRO concentrations in monitoring wells MW-2, MW-3, and MW-4 exceeded the MTCA Method A cleanup level of 500 µg/L. DRO concentrations decreased significantly in wells MW-2, MW-3, and MW-4 after the cap was installed in 2003. However, DRO concentrations began to fluctuate starting in approximately 2009 (wells MW-2 and MW-3) and 2010 (well MW-4). An increasing concentration trend has been observed in well MW-2 since September 2012.
- ORO concentrations in groundwater during this monitoring event ranged from 357 µg/L to 1,100 µg/L. The ORO concentrations in MW-3 and MW-4 exceeded the MTCA Method A

cleanup level of 500 µg/L. ORO concentrations, which had been generally consistent in each well during the period of record, began to fluctuate in approximately 2010 (wells MW-2 and MW-3) and 2012 (well MW-4) and exhibit a similar trend to DRO in wells MW-3 and MW-4.

- Benzene was only detected in wells MW-2 and MW-3 at concentrations of 5.54 and 1.21 µg/L, respectively. The benzene concentration in well MW-2 exceeded the MTCA Method A cleanup level of 5 µg/L. Prior to this event, benzene has not been detected in well MW-2 since 2012.
- Ethylbenzene was only detected in well MW-2 at a concentration of 2.39 µg/L, below the MTCA Method A cleanup level of 700 µg/L.
- Toluene and total xylenes were not detected in any of the monitoring wells at or above the laboratory reporting limit.

Groundwater analytical results for Site monitoring wells are provided on Table 2 and current results are presented on Figure 5. Graphs depicting groundwater elevation versus total petroleum hydrocarbon concentrations for wells MW-2, MW-3, and MW-4 are included as Figures 6, 7, and 8, respectively.

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. However, if the groundwater is devoid of oxygen, hydrocarbon-degrading microbes will respire anaerobically utilizing nitrate, iron (III), manganese, and sulfate to assist in petroleum hydrocarbon degradation.

During this sampling event very low DO values (below 1 mg/L) were observed in samples collected from MW-2 and MW-4 (Table 3), with an estimated DO saturation in the water of less than 10%. Also, historically, a positive correlation between low sulfate concentrations and low DO (less than 1 mg/L) has been observed at MW-3, suggesting potentially increasingly anaerobic conditions.

Furthermore, ferrous iron has been detected in samples collected from MW-3 and MW-4 in historic events, along with low concentrations of DO.

4.0 CAP INSPECTION ACTIVITIES

In 2003, a cap was constructed at the Site in order to contain the residual contamination in soil, which has exhibited concentrations of COPCs greater than the MTCA Method A cleanup levels, from leaching to groundwater. The cap consisted of approximately 10 feet of imported clean soil to raise the Site to the elevation of surrounding roadways with a layer of asphaltic concrete placed over the soil. The edges of the raised cap were surrounded by a large rock barrier to prevent erosion and limit access to the surface of the cap. As part of the cap remedy, routine inspection is required to monitor and document the integrity of the cap and associated drainage system.

Inspection of the cap and associated drainage system was conducted on June 1, 2016 as part of the first semi-annual 2016 monitoring event. Inspection of the cap surface and associated drainage system included identifying areas of wear, cracks, or defects on the asphaltic concrete, measuring and removing (if warranted) accumulated sediment deposited in catch basins and containment vessels, and document vegetation growth along the edges of the asphaltic concrete cap.

The overall condition of the asphaltic concrete cap and associated drainage system is good. However, inspection of the cap identified several cracks on the north-northeast corner, north-northwest corner, and southern edge of the asphaltic concrete cap that are approximately 0.25 to 0.5 inches wide and range from 1.5 to 5.0 feet long. The cracks are caused by the roots of the vegetation growing at the edges of the cap. Significant vegetation growth was identified along the southeastern and eastern edges of the asphaltic concrete cap with minimal growth along the northern edge. To address the vegetation growth and mitigate the impacts that growth is having the condition of the asphalt cap, major brush clearing and vegetation removal activities were completed on August 11 and 12, 2016.

The catch basin had approximately 8 inches of standing water preventing observation of the sediment, the grit chamber had standing water to just below the access steps preventing observation of the sediment, and the vault had approximately 6 inches of sediment. The inspection log and photographic documentation are presented in Appendix C.

5.0 SUMMARY

During the first semi-annual 2016 monitoring event, ORO was detected in two monitoring wells (MW-3 and MW-4) and DRO was detected in three monitoring wells (MW-2, MW-3, and MW-4) at concentrations above the MTCA Method A cleanup levels. Benzene was detected in one monitoring well (MW-2) above the MTCA Method A cleanup level. GRO and ethylbenzene were detected above the laboratory reporting limits in one well (MW-2), but the reported concentrations were below the MTCA Method A cleanup levels.

6.0 REFERENCES

GeoEngineers, 2001. Monitoring Well Installation and Ground Water Analysis, Glacier Park East Site, Leavenworth, Washington.

Washington State Department of Ecology (Ecology), 2013. Model Toxics Control Act Regulation and Statute, MTCA Cleanup Regulation Chapter 173-340 WAC, Model Toxics Control Act

Chapter 70.105D RCW, Uniform Environmental Covenants Act Chapter 64.70 RCW. Publication No. 94-06. Revised 2013.

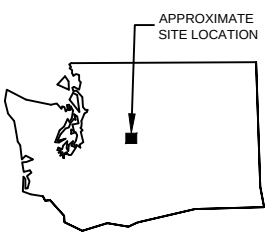
FIGURES

SOURCE AERIAL PHOTO: Google Earth, July 2013.

N

APPROXIMATE SCALE (FEET)

0 400 800



VICINITY MAP

BNSF Glacier Park East Site
Chumstick Highway and State Highway 2
Leavenworth, Washington

TRC 230814 **FIGURE 1**

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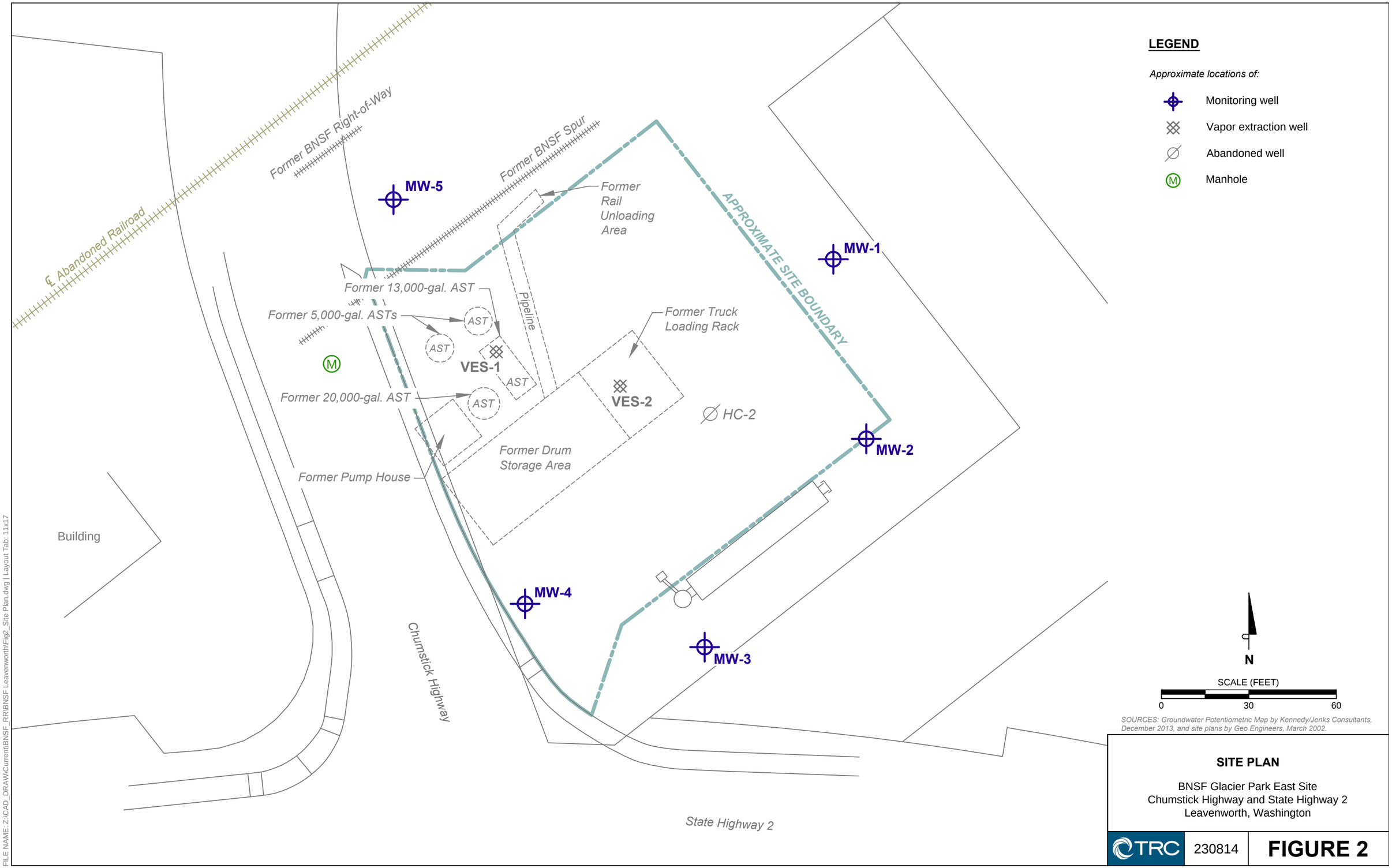


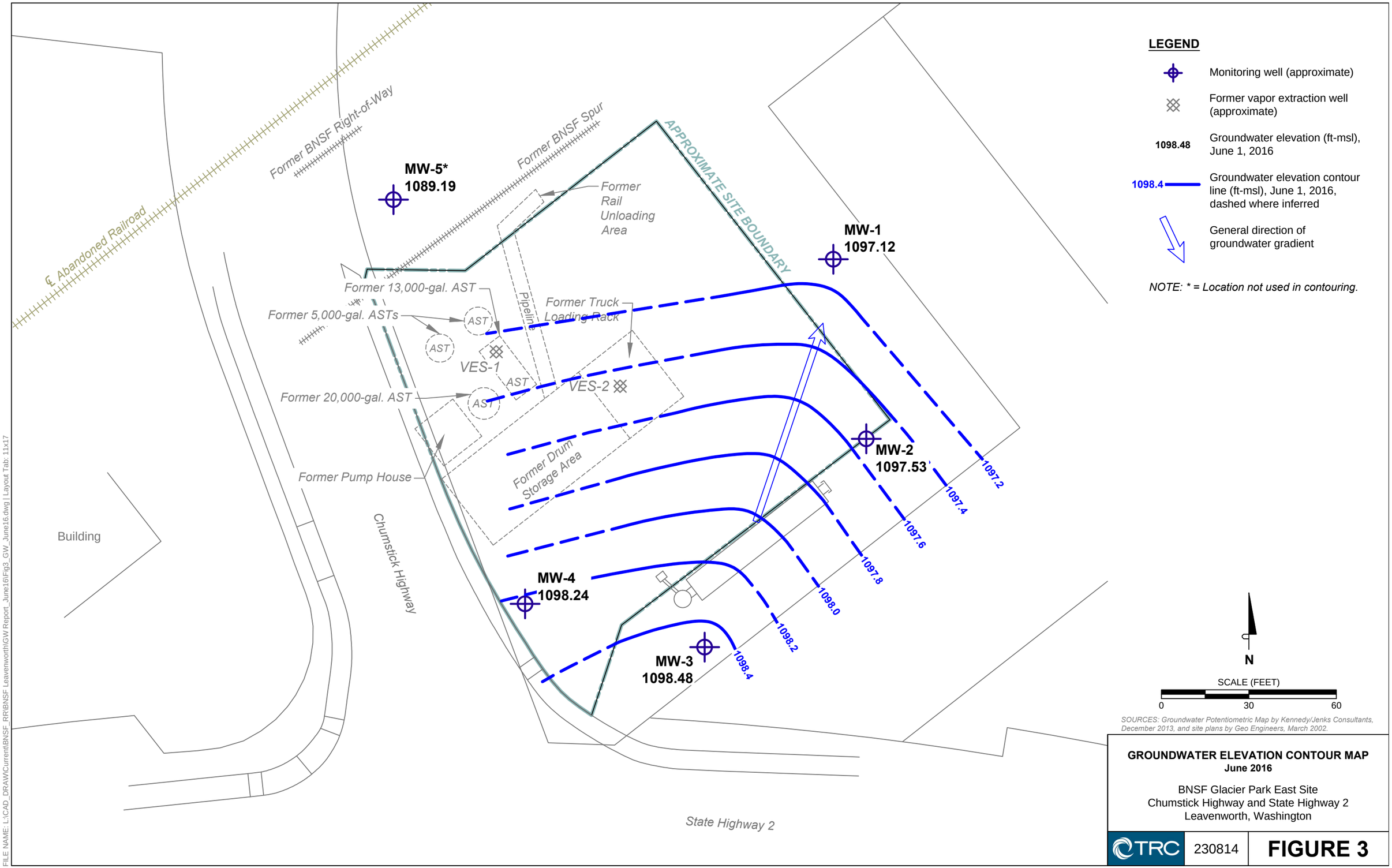
SOURCES: Groundwater Potentiometric Map by Kennedy/Jenks Consultants, December 2013, and site plans by Geo Engineers, March 2002.

SITE PLAN

BNSF Glacier Park East Site
Chumstick Highway and State Highway 2
Leavenworth, Washington

TRC | 230814 | **FIGURE 2**

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



SOURCES: Groundwater Potentiometric Map by Kennedy/Jenks Consultants, December 2013, and site plans by Geo Engineers, March 2002.

GROUNDWATER ELEVATION CONTOUR MAP
June 2016

BNSF Glacier Park East Site
Chumstick Highway and State Highway 2
Leavenworth, Washington

TRC | 230814 | **FIGURE 3**

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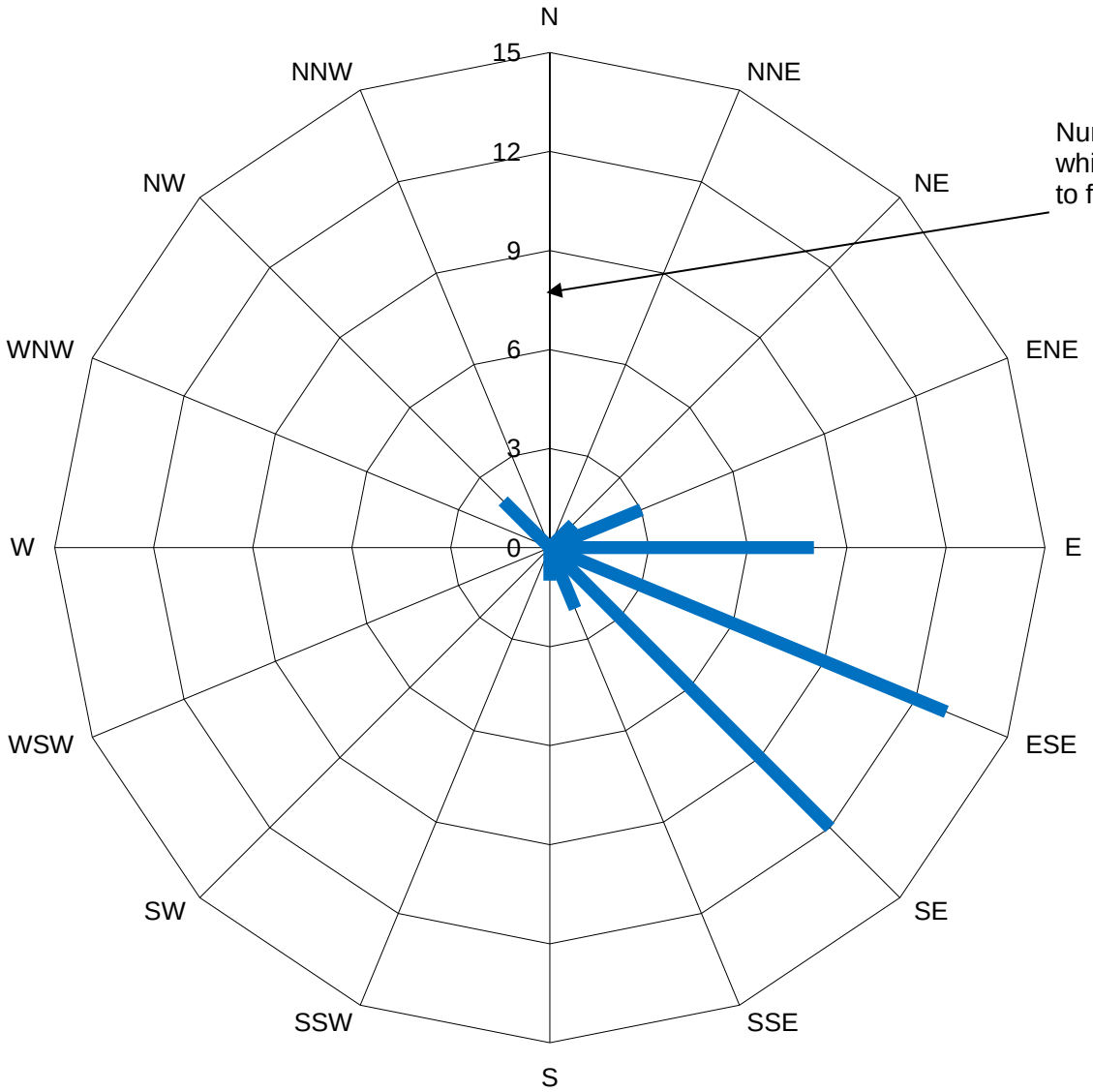
Figure 4
Historical Groundwater Flow Directions
March 2001 through June 2016
BNSF Railway Company
Glacier Park East Site, Leavenworth, Washington



Notes:
Groundwater flow directions not including MW-5.
Groundwater flow directions from 2001 to April 2010 are calculated using historic data provided by Kennedy-Jenks
Groundwater flow directions from August 2010 to November 2010 are from previous reports provided by Kennedy-Jenks

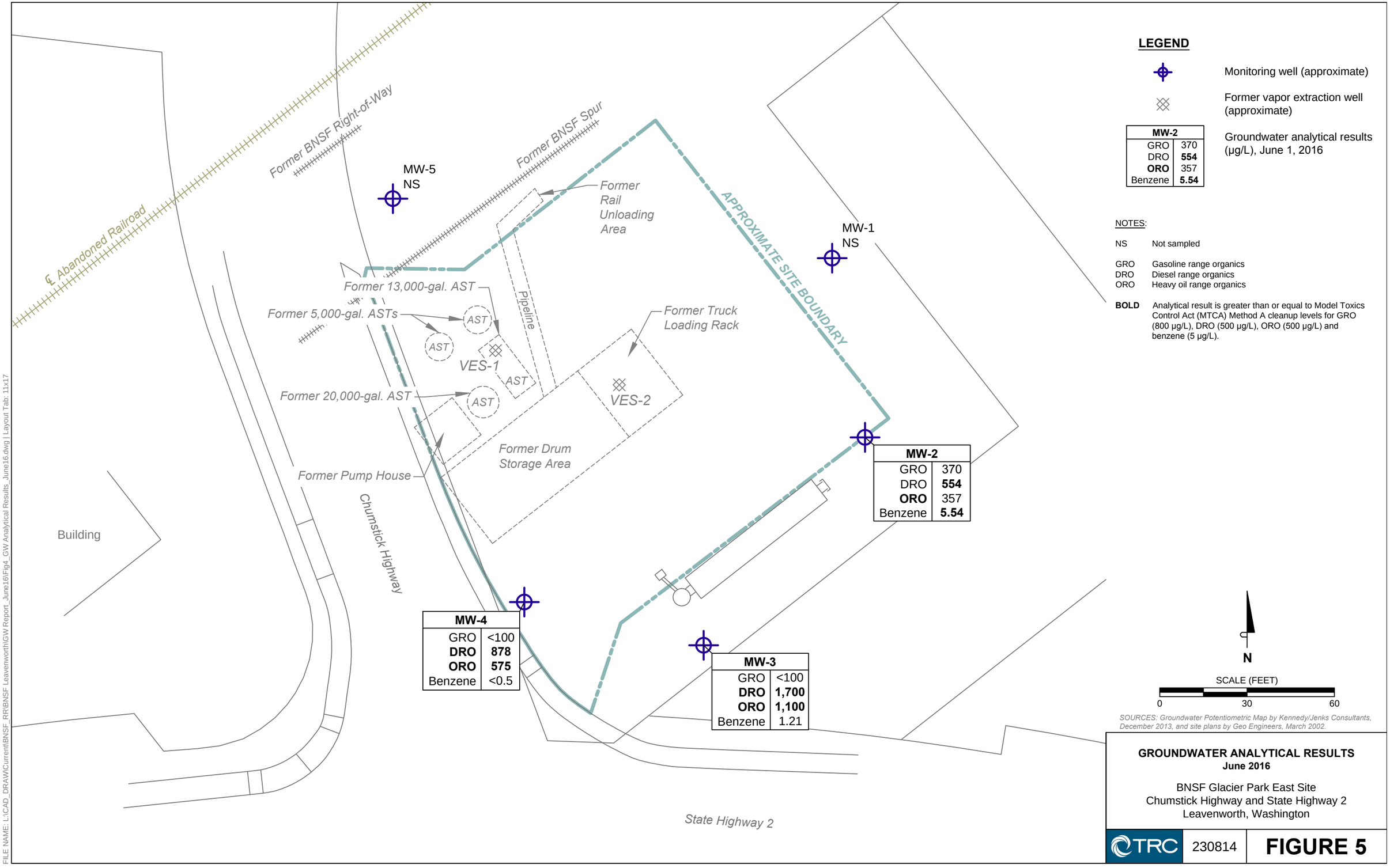


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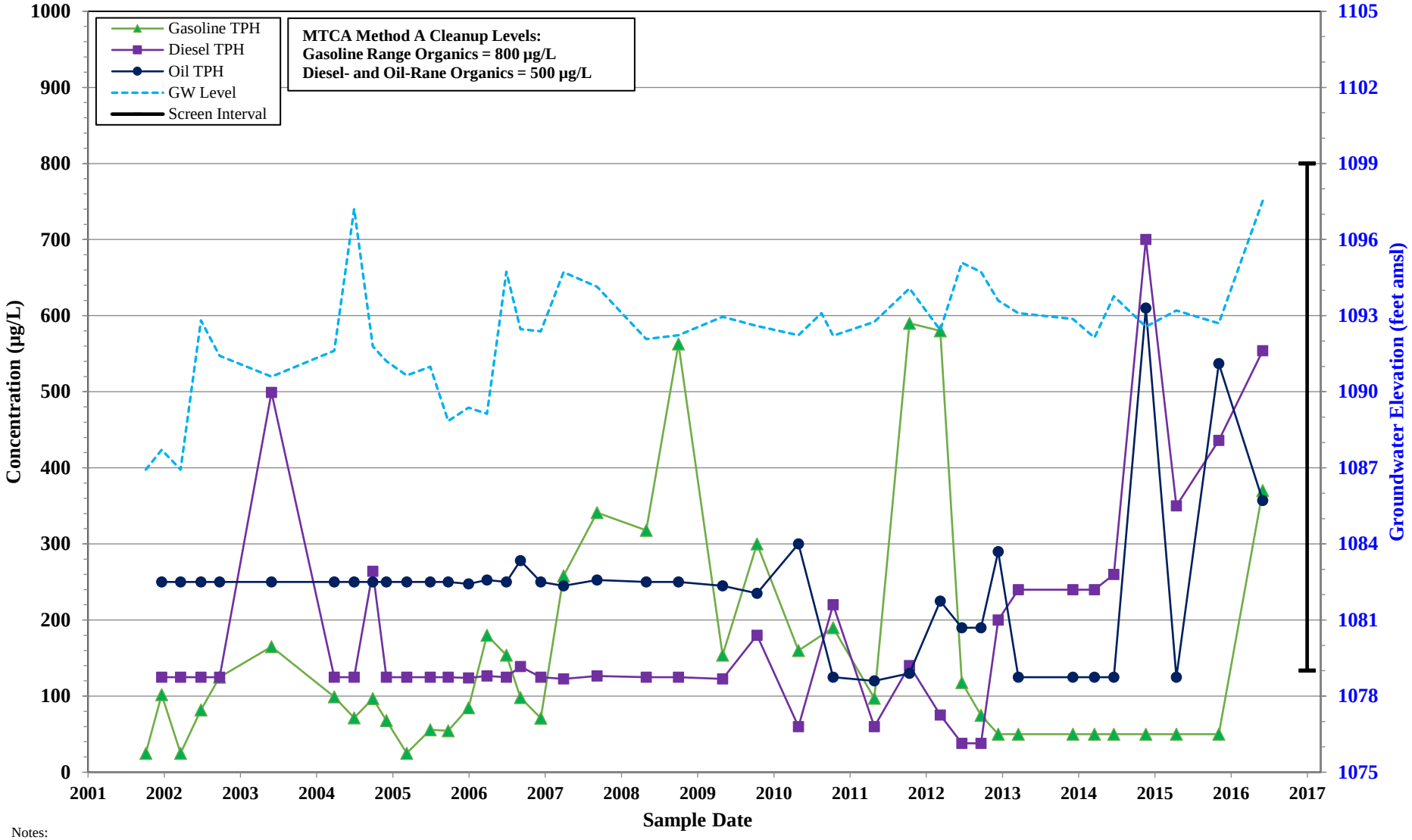
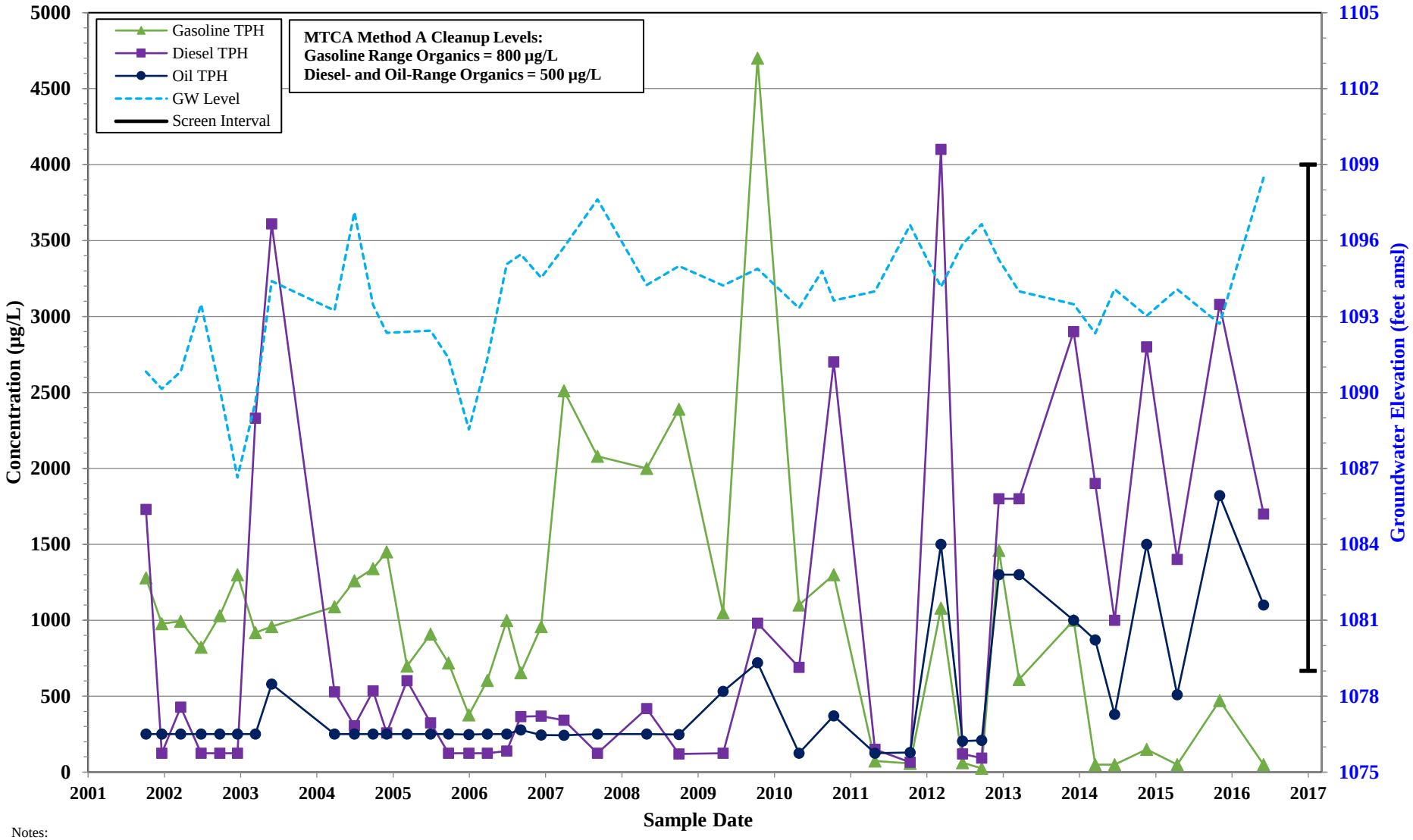
Figure 6
Groundwater Elevation versus Total Petroleum Hydrocarbons - MW-2
BNSF Railway Company
Glacier Park East, Leavenworth, Washington



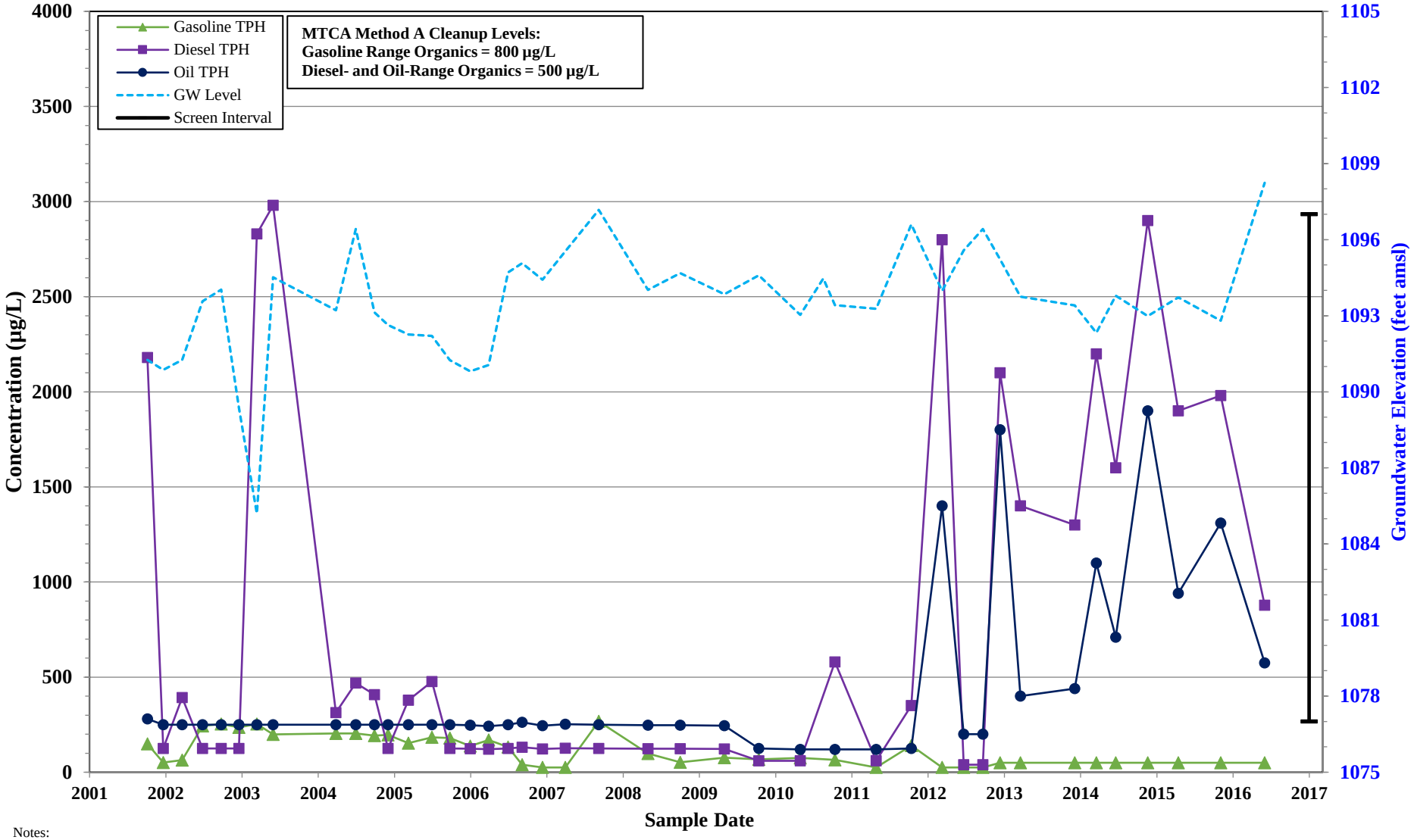
Notes:
1. Not detected (ND) results shown as half the laboratory reporting limit.

Figure 7
Groundwater Elevation versus Total Petroleum Hydrocarbons - MW-3
BNSF Railway Company
Glacier Park East, Leavenworth, Washington



Notes:
1. Not detected (ND) results shown as half the laboratory reporting limit.

Figure 8
Groundwater Elevation versus Total Petroleum Hydrocarbons - MW-4
BNSF Railway Company
Glacier Park East, Leavenworth, Washington



Notes:
1. Not detected (ND) results shown as half the laboratory reporting limit.

TABLES

Table 1
Summary of Groundwater Elevation Data
BNSF Railway Company
Glacier Park East
Leavenworth, Washington

Monitoring Well	Well Elevation (feet msl)	Date	Depth to Water (feet bgs)	Water Elevation (feet msl)	Change in Water Elevation (feet)
MW-1	1,149.84	10/5/2001	59.12	1,090.72	--
		12/20/2001	59.41	1,090.43	-0.29
		3/21/2002	59.12	1,090.72	0.29
		6/26/2002	57.29	1,092.55	1.83
		9/24/2002	57.70	1,092.14	-0.41
		12/18/2002	62.26	1,087.58	-4.56
	1,153.50	3/14/2003	65.22	1,088.28	0.70
		5/30/2003	60.30	1,093.20	4.92
	1,153.24	3/26/2004	60.44	1,092.80	-0.40
		6/29/2004	56.45	1,096.79	3.99
		9/27/2004	60.50	1,092.74	-4.05
		12/1/2004	60.69	1,092.55	-0.19
		3/9/2005	61.10	1,092.14	-0.41
		6/29/2005	61.11	1,092.13	-0.01
		9/23/2005	61.82	1,091.42	-0.71
		12/30/2005	61.69	1,091.55	0.13
		3/28/2006	61.76	1,091.48	-0.07
		6/29/2006	58.89	1,094.35	2.87
		9/5/2006	59.23	1,094.01	-0.34
		12/11/2006	59.14	1,094.10	0.09
		3/30/2007	57.85	1,095.39	1.29
		9/6/2007	--	--	--
		4/29/2008	59.30	1,093.94	-1.45
		10/1/2008	59.22	1,094.02	0.08
		4/30/2009	59.36	1,093.88	-0.14
		10/12/2009	58.94	1,094.30	0.42
		4/29/2010	59.85	1,093.39	-0.91
	1,153.21	8/17/2010	59.10	1,094.11	0.72
		10/12/2010	59.90	1,093.31	-0.80
		4/28/2011	60.02	1,093.38	0.07
		10/13/2011	58.29	1,095.11	1.73
		3/9/2012	59.34	1,093.87	-1.24
		6/20/2012	57.74	1,095.47	1.60
		9/20/2012	56.95	1,096.26	0.79
		12/11/2012	58.39	1,095.01	-1.25
		3/18/2013	59.31	1,093.90	-1.11
		12/4/2013	59.35	1,093.86	-0.04
		03/18/2014	60.08	1,093.13	-0.73
		06/19/2014	59.11	1,094.10	0.97
		11/19/2014	59.78	1,093.43	-0.67
		4/14/2015	59.80	1,093.41	-0.02
		11/3/2015	59.80	1,093.41	0.00
		6/1/2016	56.09	1,097.12	3.71

Table 1
Summary of Groundwater Elevation Data
BNSF Railway Company
Glacier Park East
Leavenworth, Washington

Monitoring Well	Well Elevation (feet msl)	Date	Depth to Water (feet bgs)	Water Elevation (feet msl)	Change in Water Elevation (feet)
MW-2	1,150.95	10/5/2001	64.02	1,086.93	-6.93
		12/20/2001	63.24	1,087.71	0.78
		3/21/2002	64.02	1,086.93	-0.78
		6/26/2002	58.14	1,092.81	5.88
		9/24/2002	59.53	1,091.42	-1.39
		12/18/2002	--	--	--
		3/14/2003	--	--	--
		5/30/2003	60.35	1,090.60	0.00
	1,161.19	3/26/2004	69.57	1,091.62	1.02
		6/29/2004	63.98	1,097.21	5.59
		9/27/2004	69.40	1,091.79	-5.42
		12/1/2004	69.98	1,091.21	-0.58
		3/9/2005	70.55	1,090.64	-0.57
		6/29/2005	70.20	1,090.99	0.35
		9/23/2005	72.34	1,088.85	-2.14
		12/30/2005	71.82	1,089.37	0.52
		3/28/2006	72.06	1,089.13	-0.24
		6/29/2006	66.46	1,094.73	5.60
		9/5/2006	68.72	1,092.47	-2.26
		12/11/2006	68.81	1,092.38	-0.09
		3/30/2007	66.48	1,094.71	2.33
		9/6/2007	67.05	1,094.14	-0.57
		4/29/2008	69.11	1,092.08	-2.06
		10/1/2008	68.96	1,092.23	0.15
		4/30/2009	68.23	1,092.96	0.73
		10/12/2009	68.60	1,092.59	-0.37
		4/29/2010	68.96	1,092.23	-0.36
	1,161.12	8/17/2010	68.02	1,093.10	0.87
		10/12/2010	68.91	1,092.21	-0.89
		4/28/2011	68.65	1,092.76	0.55
		10/13/2011	67.05	1,094.07	1.31
		3/9/2012	68.69	1,092.43	-1.64
		6/20/2012	66.03	1,095.09	2.66
		9/20/2012	66.40	1,094.72	-0.37
		12/11/2012	67.81	1,093.60	-1.12
		3/18/2013	68.02	1,093.10	-0.50
		12/4/2013	68.25	1,092.87	-0.23
		03/18/2014	68.99	1,092.13	-0.74
		06/19/2014	67.35	1,093.77	1.64
		11/19/2014	68.56	1,092.56	-1.21
		4/14/2015	67.92	1,093.20	0.64
		11/3/2015	68.42	1,092.70	-0.50
		6/1/2016	63.59	1,097.53	4.83

Table 1
Summary of Groundwater Elevation Data
BNSF Railway Company
Glacier Park East
Leavenworth, Washington

Monitoring Well	Well Elevation (feet msl)	Date	Depth to Water (feet bgs)	Water Elevation (feet msl)	Change in Water Elevation (feet)
MW-3	1,151.20	10/5/2001	60.38	1,090.82	--
		12/20/2001	61.06	1,090.14	-0.68
		3/21/2002	60.38	1,090.82	0.68
		6/26/2002	57.72	1,093.48	2.66
		9/24/2002	58.01	1,090.14	-3.34
		12/18/2002	64.56	1,086.64	-3.50
	1,156.35	3/14/2003	66.72	1,089.63	2.99
		5/30/2003	61.95	1,094.40	4.77
	1,156.34	3/26/2004	63.10	1,093.24	-1.16
		6/29/2004	59.22	1,097.12	3.88
		9/27/2004	62.88	1,093.46	-3.66
		12/1/2004	63.99	1,092.35	-1.11
		3/9/2005	63.95	1,092.39	0.04
		6/29/2005	63.90	1,092.44	0.05
		9/23/2005	64.98	1,091.36	-1.08
		12/30/2005	67.80	1,088.54	-2.82
		3/28/2006	65.01	1,091.33	2.79
		6/29/2006	61.27	1,095.07	3.74
		9/5/2006	60.89	1,095.45	0.38
		12/11/2006	61.81	1,094.53	-0.92
		3/30/2007	60.60	1,095.74	1.21
		9/6/2007	58.71	1,097.63	1.89
		4/29/2008	62.10	1,094.24	-3.39
		10/1/2008	61.35	1,094.99	0.75
		4/30/2009	62.12	1,094.22	-0.77
		10/12/2009	61.46	1,094.88	0.66
		4/29/2010	63.01	1,093.33	-1.55
	1,156.29	8/17/2010	61.49	1,094.80	1.47
		10/12/2010	62.66	1,093.63	-1.17
		4/28/2011	62.58	1,093.99	0.36
		10/13/2011	59.96	1,096.61	2.62
		3/9/2012	62.12	1,094.17	-2.44
		6/20/2012	60.43	1,095.86	1.69
		9/20/2012	59.64	1,096.65	0.79
		12/11/2012	61.33	1,095.24	-1.41
		3/18/2013	62.30	1,093.99	-1.25
		12/4/2013	62.80	1,093.49	-0.50
		03/18/2014	63.95	1,092.34	-1.15
		06/19/2014	62.21	1,094.08	1.74
		11/19/2014	63.26	1,093.03	-1.05
		4/14/2015	62.22	1,094.07	0.08
		11/3/2015	63.58	1,092.71	-3.90
		6/1/2016	57.81	1,098.48	4.31

Table 1
Summary of Groundwater Elevation Data
BNSF Railway Company
Glacier Park East
Leavenworth, Washington

Monitoring Well	Well Elevation (feet msl)	Date	Depth to Water (feet bgs)	Water Elevation (feet msl)	Change in Water Elevation (feet)
MW-4	1,155.29	10/5/2001	64.03	1,091.26	--
		12/20/2001	64.42	1,090.87	-0.39
		3/21/2002	64.03	1,091.26	0.39
		6/26/2002	61.72	1,093.57	2.31
		9/24/2002	61.26	1,094.03	0.46
		12/18/2002	65.92	1,089.37	-4.66
	1,158.42	3/14/2003	73.22	1,085.20	-4.17
		5/30/2003	63.90	1,094.52	9.32
	1,156.92	3/26/2004	63.70	1,093.22	-1.30
		6/29/2004	60.50	1,096.42	3.20
		9/27/2004	63.79	1,093.13	-3.29
		12/1/2004	64.29	1,092.63	-0.50
		3/9/2005	64.66	1,092.26	-0.37
		6/29/2005	64.72	1,092.20	-0.06
		9/23/2005	65.67	1,091.25	-0.95
		12/30/2005	66.11	1,090.81	-0.44
		3/28/2006	65.86	1,091.06	0.25
		6/29/2006	62.21	1,094.71	3.65
		9/5/2006	61.85	1,095.07	0.36
		12/11/2006	62.50	1,094.42	-0.65
		3/30/2007	61.38	1,095.54	1.12
		9/6/2007	59.75	1,097.17	1.63
		4/29/2008	62.90	1,094.02	-3.15
		10/1/2008	62.24	1,094.68	0.66
		4/30/2009	63.07	1,093.85	-0.83
		10/12/2009	62.33	1,094.59	0.74
		4/29/2010	63.89	1,093.03	-1.56
	1,156.90	8/17/2010	62.43	1,094.47	1.44
		10/12/2010	63.48	1,093.42	-1.05
		4/28/2011	63.63	1,093.27	-0.15
		10/13/2011	60.73	1,096.60	3.33
		3/9/2012	62.92	1,093.98	-2.62
		6/20/2012	61.32	1,095.58	1.60
		9/20/2012	60.48	1,096.42	0.84
		12/11/2012	62.11	1,095.22	-1.20
		3/19/2013	63.15	1,093.75	-1.47
		12/4/2013	63.49	1,093.41	-0.34
		03/18/2014	64.57	1,092.33	-1.08
		06/19/2014	63.11	1,093.79	1.46
		11/19/2014	63.91	1,092.99	-0.80
		4/14/2015	63.18	1,093.72	0.73
		11/3/2015	64.09	1,092.81	-0.91
		6/1/2016	58.66	1,098.24	5.43

Table 1
Summary of Groundwater Elevation Data
BNSF Railway Company
Glacier Park East
Leavenworth, Washington

Monitoring Well	Well Elevation (feet msl)	Date	Depth to Water (feet bgs)	Water Elevation (feet msl)	Change in Water Elevation (feet)
MW-5	1,158.11	10/5/2001	75.57	1,082.54	--
		12/20/2001	74.23	1,083.88	1.34
		3/21/2002	75.57	1,082.54	-1.34
		6/26/2002	67.96	1,090.15	7.61
		9/24/2002	73.87	1,084.24	-5.91
		12/18/2002	74.60	1,083.51	-0.73
	1,158.11	3/14/2003	73.09	1,085.02	1.51
		5/30/2003	68.95	1,089.16	4.14
		3/26/2004	72.15	1,085.96	-3.20
		6/29/2004	65.78	1,092.33	6.37
		9/27/2004	73.40	1,084.71	-7.62
		12/1/2004	72.99	1,085.12	0.41
		3/9/2005	73.25	1,084.86	-0.26
		6/29/2005	73.06	1,085.05	0.19
		9/23/2005	75.51	1,082.60	-2.45
		12/30/2005	73.86	1,084.25	1.65
		3/28/2006	73.65	1,084.46	0.21
		6/29/2006	68.18	1,089.93	5.47
		9/5/2006	73.52	1,084.59	-5.34
		12/11/2006	72.48	1,085.63	1.04
		3/30/2007	69.10	1,089.01	3.38
		9/6/2007	--	--	--
		4/29/2008	72.40	1,085.71	0.00
		10/1/2008	73.66	1,084.45	-1.26
		4/30/2009	71.29	1,086.82	2.37
		10/12/2009	73.97	1,084.14	-2.68
		4/29/2010	71.60	1,086.51	2.37
	1,158.09	8/17/2010	72.17	1,085.92	-0.59
		10/12/2010	73.07	1,085.02	-0.90
		4/28/2011	71.56	1,087.05	2.03
		10/13/2011	72.23	1,085.86	-1.19
		3/9/2012	73.08	1,085.01	-0.85
		6/20/2012	67.64	1,090.45	5.44
		9/20/2012	71.23	1,086.86	-3.59
		12/11/2012	73.23	1,085.38	-1.48
		3/18/2013	72.09	1,086.00	0.62
		12/4/2013	72.81	1,085.28	-0.72
		03/18/2014	72.28	1,085.81	0.53
		06/19/2014	69.41	1,088.68	2.87
		11/19/2014	72.44	1,085.65	-3.03
		4/14/2015	71.30	1,086.79	1.14
		11/3/2015	72.62	1,085.47	-1.32
		6/1/2016	68.90	1,089.19	3.72

Notes:
-- = not measured
bgs = below ground surface
msl = mean sea level

Table 2
Summary of Groundwater Analytical Results
BNSF Railway Company
Glacier Park East
Leavenworth, Washington

Analytical results in micrograms per liter (µg/L)

Monitoring Well	Date Sample	Total Petroleum Hydrocarbons			Volatile Organic Compounds			
		Gasoline Range	Diesel Range	Heavy Oil Range	Benzene	Toluene	Ethylbenzene	Total Xylenes
MTCA Method A Cleanup Levels [1]		800	500	500	5	1,000	700	1,000
MW-1	10/4/2001	<50	<281 I	<562	<0.5	**1.79**	<0.5	<1.0
	12/20/2001	<50	<250 J	<500	<0.5	<0.5	<0.5	<1.0
	3/21/2002	<50	<250	<500	<0.5	<0.5	<0.5	<1.0
	6/26/2002	<50	<250	<500	<0.5	<0.5	<0.5	<1.0
	9/24/2002	<50	<250	<500	<0.5	<0.5	<0.5	<1.0
	12/18/2002	<50	<250	<500	<0.5	<0.5	<0.5	<1.0
	3/14/2003	<50	**543**	<500	<0.5	<0.5	<0.5	**1.24**
	5/30/2003	<50	**710**	<500	<0.5	<0.5	<0.5	<1.0
	3/26/2004	<50	<250	<500	<0.5	<0.5	<0.5	<1.0
	6/29/2004	<50	<250	<500	<0.5	<0.5	<0.5	<1.0
	9/27/2004	<50	<250	<500	<0.5	<0.5	<0.5	<1.0
	12/1/2004	<50	<250	<500	<0.5	<0.5	<0.5	<1.0
	3/9/2005	<50	<250	<500	<0.5	<0.5	<0.5	<1.0
	6/29/2005	<50	**1,710**	**1,130**	<0.5	<0.5	<0.5	<1.0
	6/29/2005 - Dup	<50	**1,040**	**722**	<0.5	<0.5	<0.5	<1.0
	9/23/2005	<50	<250	<500	<0.5	<0.5	<0.5	<1.0
	12/30/2005	<50	<282	<562	<0.5	<0.5	<0.5	<1.0
	3/28/2006	<50	<253	<505	<0.5	<0.5	<0.5	<1.0
	6/29/2006	<50	<253	<505	<0.5	<0.5	<0.5	<1.0
	9/5/2006	<80	<248	<495	<0.5	<0.5	<0.5	<1.0
	12/11/2006	<50	<250	<500	<0.5	<0.5	<0.5	<1.0
	3/30/2007	<50	<248	<495	<0.5	<0.5	<0.5	<1.0
MW-2	10/4/2001	<50	--	--	<0.5	<0.5	<0.5	<1.0
	12/20/2001	**102**	<250 J	<500	**0.52**	<0.5	<0.5	<1.0
	3/21/2002	<50	<250	<500	<0.5	<0.5	<0.5	<1.0
	6/26/2002	**82**	<250	<500	<0.5	<0.5	<0.5	**1.73**
	9/24/2002	**125**	<250	<500	<0.5	<0.5	**0.815**	**1.06**
	12/18/2002	--	--	--	--	--	--	--
	3/14/2003	--	--	--	--	--	--	--
	5/30/2003	**165**	**499**	<500	**1.18**	<0.5	<0.5	<1.0
	3/26/2004	**99.1**	<250	<500	<0.5	<0.6	<0.5	**1.30**
	6/29/2004	**71.2**	<250	<500	<0.5	<0.5	<0.5	<1.0
	9/27/2004	**96.9**	**264**	<500	<0.5	<0.5	<0.5	<1.0
	12/1/2004	**67.8**	<250	<500	<0.5	<0.5	<0.5	<1.0
	3/9/2005	<50	<250	<500	<0.5	<0.5	<0.5	<1.0
	6/29/2005	**55.6**	<250	<500	<0.5	<0.5	<0.5	<1.0
	9/23/2005	**54.6**	<250	<500	<0.5	<0.5	<0.5	<1.0
	12/30/2005	**84.6**	<248	<495	<0.5	<0.5	**0.763**	**2.74**
	3/28/2006	**180**	<253	<505	**0.558**	<0.5	**0.993**	**1.38**
	6/29/2006	**154**	<250	<500	**0.801**	<0.5	<0.5	<1.0
	9/5/2006	**98.2**	<278	<556	**0.932**	<0.5	**0.79**	<1.0
	12/11/2006	**71**	<250	<500	<0.5	<0.5	<0.5	<1.0
	3/30/2007	**258**	<245	<490	**2.66**	<0.5	**1.11**	**2.12**
	9/6/2007	**341**	<253	<505	**5.28**	<0.5	**3.67**	**3.23**
	4/29/2008	**318**	<250	<500	**3.22**	<0.5	**0.968**	**1.28**
	10/1/2008	**563**	<250	<500	**2.97**	**0.608**	**3.93**	**2.88**
	4/30/2009	**154**	<245	<490	**0.604**	<0.5	<0.5	**1.10**
	10/12/2009	**300**	**180**	<470	**1.0 H**	<1.0	<1.0	<1.0
	4/29/2010	**160**	<120	**300**	<0.5	<0.5	<0.5	**1.8**
	10/12/2010	**190**	**220**	<250	**0.76**	<0.5	<0.5	<1.0
	4/28/2011	**97**	<120	<240	<1.0	<1.0	<1.0	<1.0
	10/13/2011	**590**	**140**	<260	**4.6**	<1.0	**6.4**	**2.7**
	3/9/2012	**580**	**75.2**	<450	<1.0	<1.0	<1.0	<3.0
	6/20/2012	**118**	<76	<380	**1.1**	<1.0	<1.0	<3.0
	9/20/2012	**74.7**	<76	<380	<1.0	<1.0	<1.0	<3.0
	12/11/2012	<100	**200**	**290**	<1.0	<1.0	<1.0	<3.0
	3/18/2013	<100	**240**	<250	<0.5	<5.0	<0.5	<1.5
	12/4/2013	<100	**240**	<250	<0.5	<5.0	<0.5	<1.5

Table 2
Summary of Groundwater Analytical Results
BNSF Railway Company
Glacier Park East
Leavenworth, Washington

Analytical results in micrograms per liter (µg/L)

Monitoring Well	Date Sample	Total Petroleum Hydrocarbons			Volatile Organic Compounds			
		Gasoline Range	Diesel Range	Heavy Oil Range	Benzene	Toluene	Ethylbenzene	Total Xylenes
MTCA Method A Cleanup Levels [1]		800	500	500	5	1,000	700	1,000
MW-2 Continued	3/18/2014	<100	**240**	<250	<0.5	<5.0	<0.5	<1.5
	6/19/2014	<100	**260**	<250	<0.5	<5.0	<0.5	<1.5
	11/20/2014	<100	**700**	**610**	<0.5	<5.0	<0.5	<1.5
	4/15/2015	<100	**350**	<250	<0.5	<5.0	<0.5	<1.5
	11/3/2015	<100	**436**	**537**	<0.5	<5.0	<0.5	<1.5
	6/1/2016	**370**	**554**	**357**	**5.54**	<5.0	**2.39**	<1.50 B
MW-3	10/5/2001	**1,280 I**	**1,730**	<500	**28.1 I**	**11.2 I**	**51.6 I**	**4.52 I**
	12/20/2001	**977 I**	<250 J	<500 J	**19.2 I**	**2.40 I**	**7.62 I**	**3.55 I**
	12/20/2001 - Dup	**950 I**	<250 J	<500 J	**19.3 I**	**2.42 I**	**7.60 I**	**3.55 I**
	3/21/2002	**993 I**	**255**	<500	**14.9 I**	**2.95 I**	**4.58 I**	**7.35 I**
	3/21/2002 - Dup	**963 I**	**428**	<500	**16.7 I**	**1.23 I**	**2.66 I**	**1.84 I**
	6/26/2002	**823**	<250	<500	**16.6**	**1.02 I**	**2.46 I**	**3.6**
	6/26/2002 - Dup	**762**	<250	<500	**15.4**	**1.03 I**	**2.48 I**	**3.56 I**
	9/24/2002	**1,020 I**	<250 J	<500 J	**16.2 I**	**4.77 I**	**29.4 I**	**8.74 I**
	9/24/2002 - Dup	**1,030 I**	<250 J	<500 J	**16.3 I**	**4.73 I**	**29.6 I**	**8.69 I**
	12/18/2002	**1,300**	<250	<500	**20.7**	**7.42**	**78.9**	**10.4**
	12/18/2002 - Dup	**1,250**	<250	<500	**21.1**	**7.43**	**79.4**	**10.2**
	3/14/2003	**919 I**	**2,330**	<500	**12 I**	**2.58 I**	**27.7 I**	**2.5 I**
	3/14/2003 - Dup	**849 I**	**2,200**	<500	**11.4 I**	**2.21 I**	**25.5 I**	**2.32 I**
	5/30/2003	**959**	**2,820**	<500	**22.7**	**6.01**	**42.8**	**7.12**
	5/30/2003 - Dup	**845**	**3,610**	**580**	**14.4**	**3.88**	**27**	**3.46**
	3/26/2004	**1,060**	**443**	<500	**19.7**	**7.44**	**24**	**4.32**
	3/26/2004 - Dup	**1,090**	**528**	<500	**19.1**	**7.14**	**23**	**3.62**
	6/29/2004	**1,260**	**305**	<500	**25.6**	**8.11**	**20.7**	**2.99**
	6/29/2004 - Dup	**1,050**	<250	<500	**21.7**	**6.82**	**17.4**	**2.61**
	9/27/2004	**1,340**	**535**	<500	**19.4**	**9.41**	**31.8**	**7.29**
	12/1/2004	**1,450**	**259**	<500	**20.9**	**8.06**	**27**	**4.82**
	3/9/2005	**698**	**602**	<500	**11.7**	**2.52**	**4.84**	**1.28**
	3/9/2005 - Dup	**639**	**334**	<500	**9.33**	**1.98**	**3.84**	<1.0
	6/29/2005	**909**	**324**	<500	**11**	**1.67**	**4.72**	**2.27**
	6/29/2005 - Dup	--	--	<501	--	--	--	--
	9/23/2005	**718**	<250	<500	**7.38**	**0.994**	**1.96**	**2.25**
	12/30/2005	**377**	<248	<495	**5.01**	**0.799**	**0.89**	**1.04**
	3/28/2006	**603**	<250	<500	**4.28**	<0.5	**0.918**	**1.99**
	6/29/2006	**998**	<278	<500	**12.7**	**1.61**	**10.5**	**3.03**
	9/5/2006	**655**	**366**	<556	**20.1**	**8.83**	**74.5**	**33.5**
	12/11/2006	**959**	**369**	<490	**4.66**	<0.5	<0.5	**2.06**
	3/30/2007	**2,510**	**341**	<485	**32.3**	**17.7**	**89.9**	**56.8**
	9/6/2007	**2,080**	<250	<500	**30.7**	**38.8**	**137**	**106**
	4/29/2008	**1,550 J**	**419 I**	<476	**12.8**	**16.2**	**48.4**	**29.9**
	4/29/2008 - Dup	**2,000 J**	<250	<500	**16.7**	**19.9**	**54.6**	**31.7**
	10/1/2008	**2,250 J**	<248	<495	**17.4**	**24.2**	**117**	**84.2**
	10/1/2008 - Dup	**2,390 J**	<240	<481	**18.3**	**25.4**	**118**	**88.9**
	4/30/2009	**1,050**	<248	**532**	**9.39**	**7.33**	**26.5**	**25**
	4/30/2009 - Dup	**1,040**	<238	<476	**9.36**	**7.3**	**26.2**	**24.6**
	10/12/2009	**4,600**	**980**	**720**	**27**	**41**	**180**	**40**
	10/12/2009 - Dup	**4,700**	**910**	**570**	**27**	**43**	**190**	**42**
	4/29/2010	**1,100**	**690**	<250	**9.9**	**7.5**	**16**	**13**
	4/29/2010 - Dup	**890**	**480**	<250	**9**	**6.4**	**14**	**12**
	10/12/2010	**1,300**	**1,600**	<240	**11**	**18**	**69**	**68**
	10/12/2010 - Dup	**1,300**	**2,700**	**370**	**10**	**18**	**70**	**69**
	4/28/2011	**65**	**120**	<250	**1**	<1.0	<1.0	<1.0
	4/28/2011 - Dup	**74**	**150**	<250	**1**	<1.0	<1.0	<1.0
	10/13/2011	<50	<130	<260	<1.0	<1.0	<1.0	<1.0
	10/13/2011 - Dup	**57**	<120	<250	<1.0	<1.0	<1.0	<1.0
	3/9/2012	**1,080**	**3,800**	**1,400**	**10**	**9.6**	**9.7**	**18.6**
	3/9/2012 - Dup	**985**	**4,100**	**1,500**	**9.1**	**8.7**	**8.9**	**17**
	6/20/2012	**50.6**	**120**	<380	**1.4**	<1.0	<1.0	<3.0
	6/20/2012 - Dup	**62.1**	<82	<410	**1.6**	<1.0	<1.0	<3.0
	9/20/2012	<50	**93**	<420	<1.0	<1.0	<1.0	<3.0

Table 2
Summary of Groundwater Analytical Results
BNSF Railway Company
Glacier Park East
Leavenworth, Washington

Analytical results in micrograms per liter (µg/L)

Monitoring Well	Date Sample	Total Petroleum Hydrocarbons			Volatile Organic Compounds			
		Gasoline Range	Diesel Range	Heavy Oil Range	Benzene	Toluene	Ethylbenzene	Total Xylenes
MTCA Method A Cleanup Levels [1]		800	500	500	5	1,000	700	1,000
MW-3 Continued	9/20/2012 - Dup	<50	<79	<400	<1.0	<1.0	<1.0	<3.0
	12/11/2012	**1,460**	**1,800**	**1,300**	**7.3**	**39.9**	**14.9**	**71.5**
	12/11/2012 - Dup	**708**	**1,600**	**1,300**	**3.7**	**22.9**	**7.2**	**35.1**
	3/18/2013	**600**	**1,800**	**1,300**	**5.2**	**7.8**	**2.7**	**24**
	3/18/2013 - Dup	**610**	**1,100**	**250**	**5.4**	**8.1**	**2.8**	**25**
	12/4/2013	**1,000**	**2,300**	**630**	**14**	**21**	**19**	**110**
	12/4/2013 - Dup	**1,000**	**2,900**	**1,000**	**14**	**20**	**19**	**110**
	3/18/2014	<100	**1,900**	**860**	**1.7**	<5.0	<0.5	**1.6**
	3/18/2014 - Dup	<100	**1,900**	**870**	**1.6**	<5.0	<0.5	**1.6**
	6/19/2014	<100	**800**	**250**	**0.95**	<5.0	<0.5	<1.5
	6/19/2014 - Dup	<100	**1,000**	**380**	<0.5	<5.0	<0.5	<1.5
	11/20/2014	**150**	**2,700**	**1,400**	**1.7**	<5.0	**0.74**	<1.5
	11/20/2014 - Dup	**120**	**2,800**	**1,500**	**1.8**	<5.0	**0.64**	<1.5
	4/15/2015	<100	**1,400**	**510**	**0.77**	<5.0	<0.5	<1.5
	11/3/2015	**471**	**3,080**	**1,820**	**4.65**	<5.0	**1.95**	**5.68**
	6/1/2016	<100	**1,700**	**1,100**	**1.21**	<5.0	<0.5	<1.5 B
MW-4	10/5/2001	**149**	**1,940**	<561	<0.5	**2.17**	<0.5	<1.0
	10/5/2001 - Dup	**140**	**2,180**	<561	<0.5	**2.08**	<0.5	<1.0
	12/20/2001	**50.7**	<250 J	<500 J	<0.5	<0.5	<0.5	<1.0
	3/21/2002	**63.4**	**393**	<500	<0.5	<0.5	<0.5	<1.0
	6/26/2002	**244**	<250	<500	**2.73**	<0.5	<0.5	**1.06**
	9/24/2002	**253**	<250	<500	**3.31**	<0.5	<0.5	**1.01**
	12/18/2002	**236**	<250	<500	**1.73**	<0.5	<0.5	<1.0
	3/14/2003	**254**	**2,830**	<500	**0.847**	<0.5	<0.5	<1.0
	5/30/2003	**199**	**2,980**	<500	**0.602**	<0.5	<0.5	<1.0
	3/26/2004	**204**	**314**	<500	<0.5	<0.5	<0.5	<1.0
	6/29/2004	**204**	**469**	<500	<0.5	<0.5	<0.5	<1.0
	9/27/2004	**192**	**408**	<500	<0.5	<0.5	<0.5	<1.0
	12/1/2004	**196**	<250	<500	<0.5	<0.5	<0.5	<1.0
	3/9/2005	**153**	**378**	<500	<0.5	<0.5	<0.5	<1.0
	6/29/2005	**183**	**477**	<500	<0.5	<0.5	<0.5	<1.0
	9/23/2005	**180**	<250	<500	<0.5	<0.5	<0.5	<1.0
	12/30/2005	**137**	<248	<495	<0.5	<0.5	<0.5	<1.0
	3/28/2006	**170**	<243	<485	<0.5	<0.5	<0.5	<1.0
	6/29/2006	**132**	<250	<500	<0.5	<0.5	<0.5	<1.0
	9/5/2006	<80	<263	<526	<0.5	<0.5	<0.5	<1.0
	12/11/2006	<50	<245	<490	<0.5	<0.5	<0.5	<1.0
	3/30/2007	<50	<253	<505	<0.5	<0.5	<0.5	<1.0
	9/6/2007	**267**	<250	<500	0.65	<0.5	<0.5	<3.0
	4/29/2008	**98.7**	<248	<495	<0.5	<0.5	<0.5	<1.0
	10/1/2008	**52.2**	<248	<495	<0.5	<0.5	<0.5	<1.0
	4/30/2009	**76.4**	<245	<490	--	<0.5	<0.5	<1.0
	10/12/2009	**68**	<120	<250	<1.0	<1.0	<1.0	<1.0
	4/29/2010	**75**	<120	<240	<0.5	<0.5	<0.5	<1.0
	10/12/2010	**65**	**580**	<240	<0.5	<0.5	<0.5	<1.0
	4/28/2011	<50	<120	<240	<1.0	<1.0	<1.0	<1.0
	10/13/2011	**140**	**350**	<250	<1.0	<1.0	<1.0	<1.0
	3/9/2012	<50	**2,800**	**1,400**	<1.0	<1.0	<1.0	<3.0
	6/20/2012	<50	<79	<400	<1.0	<1.0	<1.0	<3.0
	9/20/2012	<50	<79	<400	<1.0	<1.0	<1.0	<3.0
	12/11/2012	<100	**2,100**	**1,800**	<1.0	<1.0	<1.0	<3.0
	3/18/2013	<100	**1,400**	**400**	<0.5	<5.0	<0.5	<1.5
	12/4/2013	<100	**1,300**	**440**	<0.5	<5.0	<0.5	<1.5
	3/18/2014	<100	**2,200**	**1,100**	<0.5	<5.0	<0.5	<1.5
	6/19/2014	<100	**1,600**	**710**	<0.5	<5.0	<0.5	<1.5
	11/20/2014	<100	**2,900**	**1,900**	<0.5	<5.0	<0.5	<1.5
	4/15/2015	<100	**1,900**	**940**	**0.56**	<5.0	<0.5	<1.5

Table 2
Summary of Groundwater Analytical Results
BNSF Railway Company
Glacier Park East
Leavenworth, Washington

Analytical results in micrograms per liter (µg/L)

Monitoring Well	Date Sample	Total Petroleum Hydrocarbons			Volatile Organic Compounds			
		Gasoline Range	Diesel Range	Heavy Oil Range	Benzene	Toluene	Ethylbenzene	Total Xylenes
MTCA Method A Cleanup Levels [1]		800	500	500	5	1,000	700	1,000
MW-4 Continued	4/15/2015 - Dup	<100	**1,800**	**790**	<0.5	<5.0	<0.5	<1.5
	11/3/2015	<100	**1,980**	**1,310**	<0.5	<5.0	<0.5	<1.5
	6/1/2016	<100	**878**	**575**	<0.5	<5	<0.5	<1.5 B
	6/1/16 - Dup	<100	**1,160**	**937**	<0.5	<5	<0.5	<1.5 B
MW-5	10/5/2001	<50	--	--	<0.5	<0.5	<0.5	<1.0
	12/20/2001	<50	<250 J	<500	<0.5	<0.5	<0.5	<1.0
	3/21/2002	<50	<250	<500	<0.5	<0.5	<0.5	<1.0
	6/26/2002	<50	<250	<500	<0.5	<0.5	<0.5	<1.0
	9/24/2002	<50	<250	<500	<0.5	<0.5	<0.5	<1.0
	12/18/2002	<50	<250	<500	<0.5	<0.5	<0.5	<1.0
	3/14/2003	<50	<250	<500	<0.5	<0.5	<0.5	**1.24**
	5/30/2003	<50	<250	<500	<0.5	<0.5	<0.5	<1.0
	3/26/2004	<50	<250	<500	<0.5	<0.5	<0.5	<1.0
	6/29/2004	<50	<250	<500	<0.5	<0.5	<0.5	<1.0
	9/27/2004	<50	<250	<500	<0.5	<0.5	<0.5	<1.0
	9/27/2004 - Dup	<50	<250	<500	<0.5	<0.5	<0.5	<1.0
	12/1/2004	<50	<250	<500	<0.5	<0.5	<0.5	<1.0
	12/1/2004 - Dup	<50	<250	<500	<0.5	<0.5	<0.5	<1.0
	3/9/2005	<50	<250	<500	<0.5	<0.5	<0.5	<1.0
	6/29/2005	<50	<250	<500	<0.5	<0.5	<0.5	<1.0
	9/23/2005	<50	<250	<500	<0.5	<0.5	<0.5	<1.0
	9/23/2005 - Dup	<50	<250	<500	<0.5	<0.5	<0.5	<1.0
	12/30/2005	<50	<250	<500	<0.5	<0.5	<0.5	<1.0
	12/30/2005 - Dup	<50	<248	<495	<0.5	<0.5	<0.5	<1.0
	3/28/2006	<50	<243	<485	<0.5	<0.5	<0.5	<1.0
	3/28/2006 - Dup	<50	<250	<500	<0.5	<0.5	<0.5	<1.0
	6/29/2006	<50	<250	<500	<0.5	<0.5	<0.5	<1.0
	6/29/2006 - Dup	<50	<263	<526	<0.5	<0.5	<0.5	<1.0
	9/5/2006	<80	<278	<556	<0.5	<0.5	<0.5	<1.0
	9/5/2006 - Dup	<80	<253	<505	<0.5	<0.5	<0.5	<1.0
	12/11/2006	<50	<250	<500	<0.5	<0.5	<0.5	<1.0
	12/11/2006 - Dup	<50	<248	<495	<0.5	<0.5	<0.5	<1.0
	3/30/2007	<50	<245	<490	<0.5	<0.5	<0.5	<1.0
	3/30/2007 - Dup	<50	<245	<490	<0.5	<0.5	<0.5	<1.0

Notes:
Bold indicates detections and shading indicates concentration greater than or equal to MTCA Method A Cleanup Levels.

-- = not analyzed
< = not detected above laboratory reporting limit
Dup = duplicate sample
MTCA = Model Toxics Control Act

B = the analyte was detected in the associated blank.
I = the analyte concentration may be artifically elevated because of co-eluting compounds or components.
J = the surrogate recovery for this sample cannot be accurately quantified because of interference from co-eluting compounds and/or the surrogate recovery for the sample was outside established control limits because of a sample matrix effect.
H = the samples were analyzed outside of the analytical holding time due to an analyst oversight.

[1] Washington State Department of Ecology, Model Toxics Control Act Regulation and Statute, MTCA Cleanup Regulation Chapter 173-340 WAC, Model Toxics Control Act Chapter 70.105D RCW, Uniform Environmental Covenants Act Chapter 64.70 RCW. Publication No. 94-06. Revised 2013.

Table 3
Summary of Water Quality and Geochemical Parameters
BNSF Railway Company
Glacier Park East
Leavenworth, Washington

Monitoring Well	Date Sample	Water Quality Parameters						Geochemical Parameters							
		Temperature	pH	Conductivity	Turbidity	Dissolved Oxygen	ORP	Nitrate/Nitrite	Ammonia	Sulfate	Sulfide	Ferrous Iron	Methane	Alkalinity	Manganese
		°C	--	mS/cm	NTU	mg/L	mV	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
MW-1	6/20/2012	11.20	6.80	0.896	5.24	2.19	51.3	280	<100	7,200	<400	<200	<6.6	--	--
	9/20/2012	11.59	6.74	0.869	10.58	2.65	34.78	130	110	12,800	--	<200	<6.6	372,000	905
	12/11/2012	10.17	6.77	0.540	9.13	1.39	112.7	150	70	12,800	--	<30	<6.6	378,000	866
	3/18/2013	11.20	6.74	0.813	9.56	2.08	36.8	170	<100	11,000	--	<50	--	380,000	480
	12/4/2013	10.00	6.74	0.753	6.5	1.23	234	<100	<100	11,000	--	52	<10	450,000	930
	3/18/2014	11.24	6.61	0.807	9	1.02	174	120	<250	12,000	--	<50	<10	420,000	760
	6/19/2014	13.56	6.71	0.842	15.5	2.90	263	--	--	9,900	--	--	--	420,000	--
MW-2	3/09/2012	8.09	6.66	0.989	6.18	3.88	2.5	<50	<100	18,500	<400	<200	13	--	--
	6/20/2012	11.92	7.05	1.002	14.09	0.99	-128.3	--	--	--	--	--	--	--	--
	9/20/2012	12.25	7.01	0.928	12.43	0.94	-138.4	--	--	--	--	--	--	--	--
	3/18/2013	11.23	7.82	1.153	9.86	2.49	6.9	--	--	--	--	--	--	--	--
	12/04/2013	8.60	7.14	1.140	27.4	0.97	195	--	--	--	--	--	--	--	--
	3/18/2014	11.15	7.14	1.130	12	0.78	133	--	--	--	--	--	--	--	--
	6/19/2014	14.63	7.17	1.170	19.6	2.63	213	--	--	13,000	--	--	--	560,000	--
	11/20/2014	10.81	6.78	1.100	18.8	NA	58	--	--	--	--	--	--	--	--
	4/15/2015	14.03	7.84	0.584	1.97	NA	6	--	--	--	--	--	--	--	--
	11/03/2015	11.20	7.11	1.161	6.2	0.65	-39.1	--	--	--	--	--	--	--	--
	6/01/2016	17.40	6.79	1.155	49.7[a]	0.99	272.2	--	--	--	--	--	--	--	--
MW-3	3/09/2012	11.60	6.01	1.167	23.37	0.48	7.3	<50	<100	4,300	<400	<200	10	--	--
	6/20/2012	17.02	6.26	0.958	9.43	1.29	25.7	<50	<100	4,900	2,600	<200	<6.6	--	--
	9/20/2012	15.85	6.31	0.971	9.52	2.09	26.8	54	140	5,100	--	700	<6.6	661,000	4,190
	12/11/2012	10.07	6.93	1.024	6.94	2.34	-7.3	<100	54	15,500	--	<30	<6.6	716,000	6,110
	3/18/2013	11.53	6.90	1.030	15.98	2.08	-79.3	<100	<100	<5,000	--	240	<10	620,000	5,800
	12/04/2013	10.80	7.03	1.250	10.70	0.20	-3.0	<100	<100	<5,000	--	1,200	<10	780,000	4,200
	3/18/2014	11.47	7.18	1.330	11	2.11	60	<100	<250	5,500	--	1,000	<10	720,000	3,600
	6/19/2014	13.68	7.19	1.290	27.6	2.45	153	--	--	7,500	--	--	--	680,000	--
	11/20/2014	11.52	6.79	1.240	6.8	NA	-56	--	--	--	--	--	--	--	--
	4/15/2015	15.60	7.75	0.603	1.02	NA	-81.0	--	--	--	--	--	--	--	--
	11/03/2015	12.10	6.91	1.426	2.30	0.70	-84.6	--	--	--	--	--	--	--	--
	6/01/2016	15.00	6.86	1.170	3.91	3.01	147.9	--	--	--	--	--	--	--	--
MW-4	3/09/2012	8.41	6.56	1.149	8.54	1.76	13.4	<50	<100	18,500	<400	<200	<6.6	--	--
	6/20/2012	14.80	6.80	1.110	12.02	0.70	-49	53	<100	13,900	1,500	<200	<6.6	--	--
	9/20/2012	14.27	6.82	1.118	12.43	1.18	-75.43	<50	<100	9,700	--	<200	<6.6	620,000	7,250
	12/11/2012	11.24	6.81	1.024	8.84	3.19	-120.7	<100	57	4,330	--	<30	<6.6	640,000	8,680
	3/18/2013	11.50	6.91	1.073	20.54	2.49	-18.4	<100	<100	14,000	--	87	<10	460,000	5,600
	12/04/2013	11.50	6.98	1.320	25.6	0.30	125	<100	<100	17,000	--	250	<10	640,000	1,600
	3/18/2014	12.88	6.99	1.390	6	2.14	109	<100	<250	16,000	--	320	<10	650,000	710
	6/19/2014	15.56	6.99	1.360	33.6	2.95	143	--	--	8,100	--	--	--	620,000	--
	11/20/2014	12.35	6.79	1.250	14.5	NA	-17	--	--	--	--	--	--	--	--
	4/15/2015	19.29	7.71	0.559	1.57	NA	-24	--	--	--	--	--	--	--	--
	11/03/2015	12.30	6.92	1.351	5.1	1.50	-15.8	--	--	--	--	--	--	--	--
	6/01/2016	16.30	6.74	1.246	6.56	0.97	206.3	--	--	--	--	--	--	--	--
MW-5	6/19/2014	13.96	6.76	1.080	14.3	4.45	238	--	--	18,000	--	--	--	300,000	--

Notes:
-- = not analyzed/applicable
< = not detected above laboratory reporting limit
°C = degrees Celcius
µg/L = micrograms per liter
mg/L = milligrams per liter
mS/cm = millisiemens per centimeter
mV = millivolts
NA = not available. Dissolved oxygen sensor error during monitoring well purge.
NTU = nephalometric turbidity units
ORP = oxidation-reduction potential

[a] The reading is suspect as sample visually appeared to have lower turbidity than indicated by the meter.

APPENDIX A

GENERAL FIELD PROCEDURES

GENERAL FIELD PROCEDURES

A description of the general field procedures used during monitoring activities is presented below. For an overview of protocol, refer to the appropriate section(s).

FLUID LEVEL MONITORING

Fluid levels are monitored in the wells using an electronic interface probe with conductance sensors. The presence of liquid-phase hydrocarbons is verified using a hydrocarbon-reactive paste. The depth to liquid-phase hydrocarbons and water is measured relative to the top of casing. Well boxes or casing elevations are surveyed to within 0.01 foot relative to a county or city bench mark.

LOW-FLOW PURGING AND SAMPLING

This procedure is designed to assist the user in taking representative groundwater samples from *groundwater monitoring wells*. *Samples will be collected using low-flow (minimal drawdown) purging and sampling methods* as discussed in U.S. EPA, Ground Water Issue, Publication Number EPA/540/S-95/504, April 1996 by Puls, R.W. and M.J. Barcelona - "Low-Flow (Minimal Drawdown) Ground-water Sampling Procedures."

The field sampler's objective is to purge and sample the well so that the water that is discharged from the pump, and subsequently collected, is representative of the formation water from the aquifer's identified zone of interest.

The wells to be sampled are equipped with QED Well Wizard™ bladder (squeeze-type) pumps or Peristaltic Pumps Each bladder pump or the suction inlet tubing of the peristaltic pump is positioned with its inlet located within the desired portion of the screened interval of the well. The down well equipment includes a bladder pump and/or Teflon-lined PE (polyethylene) tubing.

Initial Pump Flow Test Procedures

If possible, the optimum flow rate for each well will be established during well development or redevelopment, or in advance of the actual sampling event. The monitoring well must be gauged for Static Water Level (SWL) prior to the installation of the pump and before pumping of any water from the well. The measurement will be documented on a Low Flow Ground Water Sample Collection Record, or field data sheet.

After pump/tubing installation, and confirmation that the SWL has returned to its original level (as determined prior to pump installation), the bladder pump or peristaltic pump should be started at a discharge rate between 100 ml to 300 ml per minute without any in-line flow cell connected. The water level in the well casing must be monitored continuously for any change from the original measurement. If significant drawdown is observed, the pump's flow rate should be incrementally reduced until the SWL drawdown ceases and stabilizes. Total drawdown from the initial (static) water level should not exceed 25% of the distance between pump inlet location and the top of the well screen. (For example, if a well has a 10-foot screen zone and the pump inlet is located mid-screen; the maximum drawdown should be 1.25 feet.) In any case, the water level in the well should not be lowered below the top of the screen/intake zone of the well.

Once the specific well's optimum discharge rate, without an in-line flow cell connected, has been determined and documented, the in-line flow cell system to be used is connected to the well discharge and the control settings required to achieve the well's optimum discharge rate are determined with the in-line flow cell connected. (Due to the system's back-pressure, the discharge rate will be decreased by 10-20%). All control settings are to be documented on the gauging and sampling sheet as specific to that particular well's ID and will be utilized for its subsequent purging and sampling events.

Purge and Sampling Events

Prior to the initiation of purging a well, the SWL will be measured and documented. The pump will be started utilizing its documented control settings and its discharge rate will be confirmed by volumetric discharge measurement with the in-line flow cell connected. If necessary, any minor modifications to the control settings to achieve the well's optimum discharge rate will be documented on the gauging sheet. When the optimum pump flow rate has been established, the SWL draw down has stabilized within the required range and at least one pump system volume (bladder volume + discharge tubing volume) has been purged, begin taking field measurements for pH, temperature (T), conductivity (Ec), oxygen reduction potential (ORP) and dissolved oxygen (DO) using a "QED" Model MP-20 in-line flow cell, or other multi-parameter meter. All water chemistry field measurements will be documented on the field data sheet. Measurements should be taken every three to five minutes until stabilization has been achieved. Stabilization is achieved after all parameters have stabilized for three consecutive readings. In lieu of measuring all five parameters, a minimum subset would include pH, conductivity and dissolved oxygen. Three consecutive measurements indicating stability should be within:

Temperature	± 10%
pH	± 0.1 units
Conductance	± 03

When water quality parameters have stabilized, and there has been no change in the stabilized SWL (i.e., no continuous draw down), sample collection may begin.

Equipment List

The following equipment is needed to conduct low flow purging and sampling:

- Bladder pump installed within the well's screened interval
- Pump controller and air source set to operate at the specific well's documented optimum discharge rate
- In-line flow cell and meter(s) with connection fittings and tubing to measure water quality
- Water level probe or installed dedicated water level measurement system
- Sample containers appropriate for the analytical requirements
- Low Flow Ground Water Sample Collection Record, or field data sheets
- 300-500 milliliter graduated cylinder or measuring cup
- 5 gallon bucket(s) for collecting purge water
- Wristwatch with second hand or stopwatch
- Sufficient cleaning and decontamination supplies if portable water level probe is utilized
- Peristaltic pump & tubing, in place of bladder pump, if applicable
- Multi-parameter meter, in place of in-line flow cell, if applicable

Procedure QED Bladder Pumps

1. Calibrate all field instruments at the start of each day's deployment per the instrument manufacturer's instructions. Record calibration data on the "Field Instruments Calibration Documentation Form."
2. Drive to the first well scheduled to be sampled (typically the least contaminated). Make notes in the field logbook, describing the well condition and activity in the vicinity of the well. Decontaminate the portable water gauging probe by washing with phosphate-free detergent, rinsing with potable water.
3. Measure the depth to water from the surveyed reference mark on the wellhead and record the measurement on the gauging and sampling sheet. Lock the water level meter in place so that the level can be monitored during purging and sampling. When placing the probe in the well, take precautions to not disturb or agitate the water.
4. Connect the compressed air source's airline to the pump controller's "AIR IN" connection (If utilizing a gas-engine operated compressor, locate the compressor at least 25 feet, down wind from the wellhead).
5. Connect the pump controller "AIR OUT" air-line to the bladder pump's air supply fitting at the wellhead.
6. Connect the pump discharge line to the in-line flow cell's "IN" fitting.
7. Connect the flow cell's "OUT" line and secure to drain the purge water into the purge water collection container.
8. Start the air supply to the pump. Set the pump controller settings to the documented settings for the specific well. Confirm the flow rate is equal to the well's established optimum flow rate. Modify as necessary (documenting any required modifications).
9. Monitor the water level and confirm that the SWL draw down has stabilized within the well's allowable limits.
10. After a single pump-system's volume (bladder volume + discharge tubing volume) has been adequately purged, read and record water quality field measurements every three to five minutes until all parameters have stabilized within their allowable ranges for at least three consecutive measurements. When stabilization has been achieved, sample collection may begin.
11. Disconnect the flow cell, and it's tubing, from the pump discharge line before collecting samples. Decrease the pump rate to 100 milliliters per minute or less by lowering the controller's air pressure setting prior to collecting samples for volatiles. Utilize the QED Model 400 Controller's 'MANUAL SAMPLE' button to ensure minimized sample exposure to the ambient air. Refer to the task instructions for the correct order and procedures for filling sample containers. Place the samples in a cooler with enough ice to keep them at 4 degrees Centigrade.
12. Once samples for volatiles have been collected, re-establish pump flow rate to the original purge flow rate by inputting the documented controller settings for the well without the in-line flow cell connected and collect remaining samples.
13. When all sample containers have been filled, make a final measurement of the well's SWL and record the measurement on the gauging and sampling sheet. If the well has a "QED" dedicated bottom sounder, measure the well's total depth and record the measurement, as well.

14. Measure and record total purge volume collected. Consolidate generated purge water.
15. Remove and decontaminate the portable water level probe with phosphate-free detergent, rinsing with potable water.
16. Disconnect the controller air supply to the pump.
17. Secure the pump's discharge line/discharge adapter in the wellhead.
18. Secure the wellhead cover and secure with its lock. Move equipment to next well to be sampled.
19. At the end of each day, post calibrate all field instruments and record the measurements on the "Field Calibration Documentation Form".
20. Clean and decontaminate the in-line flow cell with phosphate-free detergent, rinsing with potable water.

Procedure Peristaltic Pump

1. Record all depth to water readings on field data sheets
2. Calibrate all field instruments according to manufacturer's directions.
3. Setup pump and install silicone tubing in the roller head.
4. Place suction tubing at desired intake level in well, (mid screen) and attach to pump silicone tubing.
5. Attach tubing at discharge side of pump head and place in collection container.
6. Start pump and adjust flow rate to achieve flow without depressing water level more than necessary (approx. 0.30').
7. Record parameter readings after parameters have stabilized (3 consecutive readings that fall within the acceptance criteria).
8. Decrease the flow rate of the pump to achieve approximately 100 ml/min. when collecting samples.
9. Change all tubing between wells and repeat procedure.

CHAIN OF CUSTODY PROTOCOL

Chain of custody protocol is followed for all groundwater samples selected for laboratory analysis. The chain of custody form(s) accompanies the samples from the sampling locality to the laboratory, providing a continuous record of possession prior to analysis.

DECONTAMINATION

Groundwater Sampling

Purging and sampling equipment that could contact well fluids is either dedicated to a particular well or cleaned prior to each use in a soap solution followed by two tap water rinses.

APPENDIX B

LABORATORY REPORTS AND CHAIN-OF-CUSTODY DOCUMENTATION

ANALYTICAL REPORT

June 09, 2016

TRC - BNSF Region 1

Sample Delivery Group:	L839307
Samples Received:	06/03/2016
Project Number:	230814
Description:	BNSF - Glacier Park East

Report To: Keith Woodburne
19874 141st Place NE
Woodinville, WA 98072

Entire Report Reviewed By:

Mark W. Beasley
Technical Service Representative

TABLE OF CONTENTS

MW2-060116 L839307-01 GW

Collected by: A. Meugniot | Collected date/time: 06/01/16 12:27 | Received date/time: 06/03/16 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Semi-Volatile Organic Compounds (GC) by Method NWTPHDX	WG877915	1	06/07/16 20:13	06/08/16 15:15	JNS
Volatile Organic Compounds (GC) by Method 8021B/NWTPHGX	WG878707	1	06/08/16 19:22	06/08/16 19:22	DAH

MW3-060116 L839307-02 GW

Collected by: A. Meugniot | Collected date/time: 06/01/16 13:47 | Received date/time: 06/03/16 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Semi-Volatile Organic Compounds (GC) by Method NWTPHDX	WG877915	1	06/07/16 20:13	06/08/16 15:32	JNS
Volatile Organic Compounds (GC) by Method 8021B/NWTPHGX	WG878707	1	06/08/16 19:44	06/08/16 19:44	DAH

MW4-060116 L839307-03 GW

Collected by: A. Meugniot | Collected date/time: 06/01/16 15:08 | Received date/time: 06/03/16 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Semi-Volatile Organic Compounds (GC) by Method NWTPHDX	WG877915	1	06/07/16 20:13	06/08/16 16:55	JNS
Volatile Organic Compounds (GC) by Method 8021B/NWTPHGX	WG878707	1	06/08/16 20:07	06/08/16 20:07	DAH

MW4D-060116 L839307-04 GW

Collected by: A. Meugniot | Collected date/time: 06/01/16 14:30 | Received date/time: 06/03/16 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Semi-Volatile Organic Compounds (GC) by Method NWTPHDX	WG877915	1	06/07/16 20:13	06/08/16 17:11	JNS
Volatile Organic Compounds (GC) by Method 8021B/NWTPHGX	WG878707	1	06/08/16 20:29	06/08/16 20:29	DAH

TRIP BLANK L839307-05 GW

Collected by: A. Meugniot | Collected date/time: 06/01/16 00:00 | Received date/time: 06/03/16 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Volatile Organic Compounds (GC) by Method 8021B/NWTPHGX	WG878707	1	06/08/16 16:47	06/08/16 16:47	DAH

All sample aliquots were received at the correct temperature, in the proper containers, with the appropriate preservatives, and within method specified holding times. All MDL (LOD) and RDL (LOQ) values reported for environmental samples have been corrected for the dilution factor used in the analysis. All Method and Batch Quality Control are within established criteria except where addressed in this case narrative, a non-conformance form or properly qualified within the sample results. By my digital signature below, I affirm to the best of my knowledge, all problems/anomalies observed by the laboratory as having the potential to affect the quality of the data have been identified by the laboratory, and no information or data have been knowingly withheld that would affect the quality of the data.

Mark W. Beasley
Technical Service Representative

Volatile Organic Compounds (GC) by Method 8021B/NWTPHGX

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	ug/l		ug/l		date / time	
Gasoline Range Organics-NWTPH	370		100	1	06/08/2016 19:22	WG878707
Benzene	5.54		0.500	1	06/08/2016 19:22	WG878707
Toluene	ND		5.00	1	06/08/2016 19:22	WG878707
Ethylbenzene	2.39		0.500	1	06/08/2016 19:22	WG878707
Total Xylene	ND	B	1.50	1	06/08/2016 19:22	WG878707
(S) a,a,a-Trifluorotoluene(PID)	*98.5*		*55.0-122*		*06/08/2016 19:22*	WG878707
(S) a,a,a-Trifluorotoluene(FID)	*86.2*		*62.0-128*		*06/08/2016 19:22*	WG878707

Semi-Volatile Organic Compounds (GC) by Method NWTPHDX

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	ug/l		ug/l		date / time	
Diesel Range Organics (DRO)	554		100	1	06/08/2016 15:15	WG877915
Residual Range Organics (RRO)	357		250	1	06/08/2016 15:15	WG877915
(S) o-Terphenyl	*94.6*		*50.0-150*		*06/08/2016 15:15*	WG877915

Volatile Organic Compounds (GC) by Method 8021B/NWTPHGX

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	ug/l		ug/l		date / time	
Gasoline Range Organics-NWTPH	ND		100	1	06/08/2016 19:44	WG878707
Benzene	1.21		0.500	1	06/08/2016 19:44	WG878707
Toluene	ND		5.00	1	06/08/2016 19:44	WG878707
Ethylbenzene	ND		0.500	1	06/08/2016 19:44	WG878707
Total Xylene	ND	B	1.50	1	06/08/2016 19:44	WG878707
(S) a,a,a-Trifluorotoluene(PID)	*99.3*		*55.0-122*		*06/08/2016 19:44*	WG878707
(S) a,a,a-Trifluorotoluene(FID)	*91.8*		*62.0-128*		*06/08/2016 19:44*	WG878707

Semi-Volatile Organic Compounds (GC) by Method NWTPHDX

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	ug/l		ug/l		date / time	
Diesel Range Organics (DRO)	1700		100	1	06/08/2016 15:32	WG877915
Residual Range Organics (RRO)	1100		250	1	06/08/2016 15:32	WG877915
(S) o-Terphenyl	*95.8*		*50.0-150*		*06/08/2016 15:32*	WG877915

Volatile Organic Compounds (GC) by Method 8021B/NWTPHGX

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	ug/l		ug/l		date / time	
Gasoline Range Organics-NWTPH	ND		100	1	06/08/2016 20:07	WG878707
Benzene	ND		0.500	1	06/08/2016 20:07	WG878707
Toluene	ND		5.00	1	06/08/2016 20:07	WG878707
Ethylbenzene	ND		0.500	1	06/08/2016 20:07	WG878707
Total Xylene	ND	B	1.50	1	06/08/2016 20:07	WG878707
(S) a,a,a-Trifluorotoluene(PID)	*99.2*		*55.0-122*		*06/08/2016 20:07*	WG878707
(S) a,a,a-Trifluorotoluene(FID)	*92.6*		*62.0-128*		*06/08/2016 20:07*	WG878707

Semi-Volatile Organic Compounds (GC) by Method NWTPHDX

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	ug/l		ug/l		date / time	
Diesel Range Organics (DRO)	878		100	1	06/08/2016 16:55	WG877915
Residual Range Organics (RRO)	575		250	1	06/08/2016 16:55	WG877915
(S) o-Terphenyl	*97.2*		*50.0-150*		*06/08/2016 16:55*	WG877915

Volatile Organic Compounds (GC) by Method 8021B/NWTPHGX

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	ug/l		ug/l		date / time	
Gasoline Range Organics-NWTPH	ND		100	1	06/08/2016 20:29	WG878707
Benzene	ND		0.500	1	06/08/2016 20:29	WG878707
Toluene	ND		5.00	1	06/08/2016 20:29	WG878707
Ethylbenzene	ND		0.500	1	06/08/2016 20:29	WG878707
Total Xylene	ND	B	1.50	1	06/08/2016 20:29	WG878707
(S) a,a,a-Trifluorotoluene(PID)	*99.8*		*55.0-122*		*06/08/2016 20:29*	WG878707
(S) a,a,a-Trifluorotoluene(FID)	*93.1*		*62.0-128*		*06/08/2016 20:29*	WG878707

Semi-Volatile Organic Compounds (GC) by Method NWTPHDX

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	ug/l		ug/l		date / time	
Diesel Range Organics (DRO)	1160		100	1	06/08/2016 17:11	WG877915
Residual Range Organics (RRO)	937		250	1	06/08/2016 17:11	WG877915
(S) o-Terphenyl	*96.5*		*50.0-150*		*06/08/2016 17:11*	WG877915

Volatile Organic Compounds (GC) by Method 8021B/NWTPHGX

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	ug/l		ug/l		date / time	
Gasoline Range Organics-NWTPH	ND		100	1	06/08/2016 16:47	WG878707
Benzene	ND		0.500	1	06/08/2016 16:47	WG878707
Toluene	ND		5.00	1	06/08/2016 16:47	WG878707
Ethylbenzene	ND		0.500	1	06/08/2016 16:47	WG878707
Total Xylene	ND	B	1.50	1	06/08/2016 16:47	WG878707
(S) a,a,a-Trifluorotoluene(PID)	*100*		*55.0-122*		*06/08/2016 16:47*	WG878707
(S) a,a,a-Trifluorotoluene(FID)	*93.2*		*62.0-128*		*06/08/2016 16:47*	WG878707

Method Blank (MB)

(MB) R3142392-5 06/08/16 13:05

Analyte	MB Result	MB Qualifier	MB MDL	MB RDL
	ug/l		ug/l	ug/l
Benzene	U		0.190	0.500
Toluene	0.531		0.180	5.00
Ethylbenzene	0.162		0.160	0.500
Total Xylene	U		0.510	1.50
TPHG C6 - C12	U		31.6	100
(S) a,a,a-Trifluorotoluene(FID)	*93.3*			*62.0-128*
(S) a,a,a-Trifluorotoluene(PID)	*99.8*			*55.0-122*

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3142392-1 06/08/16 11:14 • (LCSD) R3142392-2 06/08/16 11:36

Analyte	Spike Amount	LCS Result	LCSD Result	LCS Rec.	LCSD Rec.	Rec. Limits	LCS Qualifier	LCSD Qualifier	RPD	RPD Limits
	ug/l	ug/l	ug/l	%	%	%			%	%
Benzene	50.0	51.3	51.2	103	102	70.0-130			0.190	20
Toluene	50.0	50.5	49.6	101	99.1	70.0-130			1.83	20
Ethylbenzene	50.0	50.9	50.9	102	102	70.0-130			0.0400	20
Total Xylene	150	154	152	102	102	70.0-130			0.810	20
(S) a,a,a-Trifluorotoluene(FID)				*92.7*	*93.4*	*62.0-128*				
(S) a,a,a-Trifluorotoluene(PID)				*98.2*	*99.3*	*55.0-122*				

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3142392-3 06/08/16 11:59 • (LCSD) R3142392-4 06/08/16 12:21

Analyte	Spike Amount	LCS Result	LCSD Result	LCS Rec.	LCSD Rec.	Rec. Limits	LCS Qualifier	LCSD Qualifier	RPD	RPD Limits
	ug/l	ug/l	ug/l	%	%	%			%	%
TPHG C6 - C12	5500	5920	5730	108	104	66.0-123			3.21	20
(S) a,a,a-Trifluorotoluene(FID)				*104*	*104*	*62.0-128*				
(S) a,a,a-Trifluorotoluene(PID)				*112*	*112*	*55.0-122*				

L839307-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L839307-01 06/08/16 19:22 • (MS) R3142392-6 06/08/16 14:56 • (MSD) R3142392-7 06/08/16 15:18

Analyte	Spike Amount	Original Result	MS Result	MSD Result	MS Rec.	MSD Rec.	Dilution	Rec. Limits	MS Qualifier	MSD Qualifier	RPD	RPD Limits
	ug/l	ug/l	ug/l	ug/l	%	%		%			%	%
Benzene	50.0	5.54	54.2	54.1	97.3	97.2	1	35.0-147			0.0300	20
Toluene	50.0	ND	48.1	47.4	94.4	93.1	1	35.0-148			1.35	20
Ethylbenzene	50.0	2.39	50.1	50.3	95.5	95.8	1	39.0-141			0.290	20
Total Xylene	150	ND	146	145	96.5	96.0	1	33.0-151			0.480	20
(S) a,a,a-Trifluorotoluene(FID)					*86.2*	*85.9*		*62.0-128*				

L839307-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L839307-01 06/08/16 19:22 • (MS) R3142392-6 06/08/16 14:56 • (MSD) R3142392-7 06/08/16 15:18

Analyte	Spike Amount ug/l	Original Result ug/l	MS Result ug/l	MSD Result ug/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
(S) a,a,a-Trifluorotoluene(PID)					*97.6*	*97.6*		*55.0-122*				

L839307-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L839307-01 06/08/16 19:22 • (MS) R3142392-8 06/08/16 15:40 • (MSD) R3142392-9 06/08/16 16:03

Analyte	Spike Amount ug/l	Original Result ug/l	MS Result ug/l	MSD Result ug/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
TPHG C6 - C12	5500	370	6100	6110	104	104	1	58.0-122			0.160	20
(S) a,a,a-Trifluorotoluene(FID)					*104*	*105*		*62.0-128*				
(S) a,a,a-Trifluorotoluene(PID)					*108*	*109*		*55.0-122*				

Method Blank (MB)

(MB) R3142466-1 06/08/16 12:14

Analyte	MB Result	MB Qualifier	MB MDL	MB RDL
	ug/l		ug/l	ug/l
Diesel Range Organics (DRO)	U		33.3	100
Residual Range Organics (RRO)	U		83.3	250
(S) o-Terphenyl	*92.1*			*50.0-150*

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3142466-2 06/08/16 12:30 • (LCSD) R3142466-3 06/08/16 12:47

Analyte	Spike Amount	LCS Result	LCSD Result	LCS Rec.	LCSD Rec.	Rec. Limits	LCS Qualifier	LCSD Qualifier	RPD	RPD Limits
	ug/l	ug/l	ug/l	%	%	%			%	%
Diesel Range Organics (DRO)	750	812	816	108	109	50.0-150			0.440	20
Residual Range Organics (RRO)	750	796	790	106	105	50.0-150			0.820	20
(S) o-Terphenyl				*96.9*	*94.9*	*50.0-150*				

Abbreviations and Definitions

SDG	Sample Delivery Group.
MDL	Method Detection Limit.
RDL	Reported Detection Limit.
ND	Not detected at the Reporting Limit (or MDL where applicable).
U	Not detected at the Reporting Limit (or MDL where applicable).
RPD	Relative Percent Difference.
Original Sample	The non-spiked sample in the prep batch used to determine the Relative Percent Difference (RPD) from a quality control sample. The Original Sample may not be included within the reported SDG.
(S)	Surrogate (Surrogate Standard) - Analytes added to every blank, sample, Laboratory Control Sample/Duplicate and Matrix Spike/Duplicate; used to evaluate analytical efficiency by measuring recovery. Surrogates are not expected to be detected in all environmental media.
Rec.	Recovery.

Qualifier	Description
B	The same analyte is found in the associated blank.

ACCREDITATIONS & LOCATIONS

ESC Lab Sciences is the only environmental laboratory accredited/certified to support your work nationwide from one location. One phone call, one point of contact, one laboratory. No other lab is as accessible or prepared to handle your needs throughout the country. Our capacity and capability from our single location laboratory is comparable to the collective totals of the network laboratories in our industry. The most significant benefit to our "one location" design is the design of our laboratory campus. The model is conducive to accelerated productivity, decreasing turn-around time, and preventing cross contamination, thus protecting sample integrity. Our focus on premium quality and prompt service allows us to be **YOUR LAB OF CHOICE.**
***** Not all certifications held by the laboratory are applicable to the results reported in the attached report.

State Accreditations

Alabama	40660	Nevada	TN-03-2002-34
Alaska	UST-080	New Hampshire	2975
Arizona	AZ0612	New Jersey–NELAP	TN002
Arkansas	88-0469	New Mexico	TN00003
California	01157CA	New York	11742
Colorado	TN00003	North Carolina	Env375
Conneticut	PH-0197	North Carolina [1]	DW21704
Florida	E87487	North Carolina [2]	41
Georgia	NELAP	North Dakota	R-140
Georgia [1]	923	Ohio–VAP	CL0069
Idaho	TN00003	Oklahoma	9915
Illinois	200008	Oregon	TN200002
Indiana	C-TN-01	Pennsylvania	68-02979
Iowa	364	Rhode Island	221
Kansas	E-10277	South Carolina	84004
Kentucky [1]	90010	South Dakota	n/a
Kentucky [2]	16	Tennessee [14]	2006
Louisiana	AI30792	Texas	T 104704245-07-TX
Maine	TN0002	Texas [5]	LAB0152
Maryland	324	Utah	6157585858
Massachusetts	M-TN003	Vermont	VT2006
Michigan	9958	Virginia	109
Minnesota	047-999-395	Washington	C1915
Mississippi	TN00003	West Virginia	233
Missouri	340	Wisconsin	9980939910
Montana	CERT0086	Wyoming	A2LA
Nebraska	NE-OS-15-05		

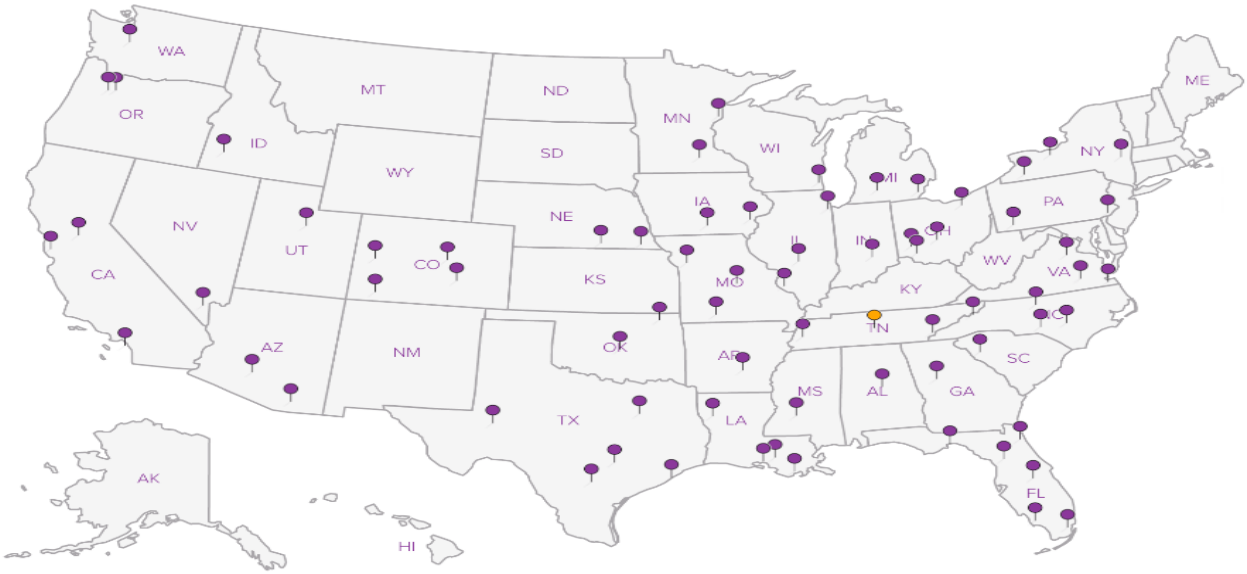
Third Party & Federal Accreditations

A2LA – ISO 17025	1461.01	AIHA	100789
A2LA – ISO 17025 [5]	1461.02	DOD	1461.01
Canada	1461.01	USDA	S-67674
EPA–Crypto	TN00003		

[1] Drinking Water [2] Underground Storage Tanks [3] Aquatic Toxicity [4] Chemical/Microbiological [5] Mold [n/a] Accreditation not applicable

Our Locations

ESC Lab Sciences has sixty-four client support centers that provide sample pickup and/or the delivery of sampling supplies. If you would like assistance from one of our support offices, please contact our main office. **ESC Lab Sciences performs all testing at our central laboratory.**



Chain of Custody Page 1 of 1

ESC LABORATORY SCIENCES
YOUR LAB OF CHOICE
12065 Lebanon Rd
Mount Juliet, TN 37122
Phone: 615-758-5858
Phone: 800-767-5859
Fax: 615-758-5859

L# L839307
Table # D123
Acctnum:
Template:
Prelogin:
TSR:
PB:
Shipped Via:

Company Name/Address:
TRC
19874 141st Place NE
Woodinville, WA 98072

Billing Information:
BNSF
ATTN: Scott MacDonald
2454 Occidental Ave S, Ste. 1A
Seattle, WA 98134

Report to: **Keith Woodburne**

Email To: **kwoodburne@trcsolutions.com**

Project Description: **BNSF Glacier Park East (GPE)**

City/State Collected: **Leavenworth, WA**

Phone: **(425) 489-1938**
Fax:

Client Project # **230814**

Lab Project # **BNSF1TRC**

Collected by (print): **A. Meugniot**

Site/Facility ID #

P.O. # **TTB006-Q03**

Collected by (signature): Amanda M Meugniot

Immediately Packed on Ice N ____ Y ✓

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

Date Results Needed

Email? ___No ✓Yes
FAX? ✓No ___Yes

Analysis / Container / Preservative

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	NWTPHDX 40mlAmb-HCl-BT	NWTPHGX/BTEX 40mlAmb HCl								Rem./Contaminant	Sample # (lab only)
MW2-060116	Grab	GW		6/1/16	1227	6	X	X									-01
MW3-060116	Grab	GW		6/1/16	1347	6	X	X									-02
MW4-060116	Grab	GW		6/1/16	1508	6	X	X									-03
MW4D-060116	Grab	GW		6/1/16	1430	6	X	X									-04
TRIP BLANK						1		X									-05

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

Remarks: 6645-0387-1575

pH _____ Temp _____

Flow _____ Other _____

Hold #

Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)
Amanda M Meugniot	6/2/16	1205	
Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)
Relinquished by : (Signature)	Date:	Time:	Received for lab by: (Signature) Jessica Rotie

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

Temp: 1.8 °C Bottles Received: 25

Date: 6-3-16 Time: 0900

Condition: DW89 OK (lab use only)

COC Seal Intact: ____ Y ____ N ____ NA

pH Checked: NCF:

APPENDIX C

CAP INSPECTION

Cap Inspection Log

BNSF Glacier Park East Site
Leavenworth, Washington

Inspection Date: June 01, 2016
Inspected by: A. Meugniot, TRC

Inspection Area	Observations
1. Asphalt Concrete Pavement	
a. Presence of cracks greater than 1/8" wide	Cracks present on north-northeast corner of asphalt cap, approximately 0.5 inches wide. 0.5 inches deep, and up to 5 feet long (Photos #5 and #6). Cracks present on southern and southeast corner of asphalt cap, approximately 0.25 inches wide and up to 5 feet long (Photos #8 and #9).
b. Sub-base material exposed	No.
c. Pavement edge deterioration	Yes. Pavement edge deteriorating along northern and southern edges where vegetation is growing and along the eastern edge at the location of the steps to MW-1 (Photo #7).
d. General appearance	Good.
2. Catch Basin	
a. Structural Condition/General Appearance	Good.
b. Sediment Accumulation, approximate	Water in vault, did not observe any sediment (Photo # 10).
3. Grit Chamber	
a. Structural Condition/General Appearance	Good.
b. Sediment Accumulation, approximate	Water in grit chamber. Did not observe any sediment (Photo #11).
4. Vault	
a. Structural Condition/General Appearance	Good. Minor rust on ladder.
b. Sediment Accumulation, approximate	Approximately 4" of sediment accumulation in vault (Photo #12).

Appendix C
Property Condition Assessment Photograph Log

Photo 1: View looking north along western edge of cap, along slope break.

Photo 2: View looking east along southern edge of cap. Note vegetation growth along margin of asphalt cap.

Photo 3: View looking south along eastern edge of cap. Note vegetation growth along margin of asphalt cap.

Photo 4: View looking east along northern edge of cap. Note vegetation growth along margin of asphalt cap.

Appendix C
Property Condition Assessment Photograph Log

Photo 5: Crack in northeastern corner of asphalt cap. Cracks developing and elongating as a result of root expansion.

Photo 6: Close-up view of crack in northeastern corner of asphalt cap.

Photo 7: Close-up view of detoriating eastern edge of asphalt cap at stairs down to MW-1.

Photo 8: Crack developing in southeastern corner of asphalt cap.

TRC Job No.	Photographs Taken By:	Page No.	Client:	Site Name & Address:
230814	A. Meugniot	2 of 3	BNSF Railway Company	Glacier Park East Site Leavenworth, WA

Appendix C
Property Condition Assessment Photograph Log

Photo 9: Crack parallel to northern edge of asphalt cap.

Photo 10: View of inside catch basing located on asphalt cap. Approximately 8” of water in vault.

Photo 11: View inside grit chamber at cap.

Photo 12: View inside vault at cap.