Kennedy Jenks
32001 32nd Avenue South, Suite 100
Federal Way, Washington 98001
253-835-6400

25 February 2019

Ms. Sandra Treccani
Site Manager
Washington State Department of Ecology
4601 North Monroe Street
Spokane, Washington 99205

Subject: Second Semiannual 2018 Groundwater Sampling Results
BNSF Railway Company, Parkwater Rail Yard
Spokane, Washington
KJ 1896110.00

Dear Ms. Treccani:

This letter summarizes the monitoring activities and presents the field and laboratory results for samples collected during the second semiannual 2018 groundwater sampling event at the BNSF Railway Company (BNSF) Parkwater Rail Yard (Site) located in Spokane, Washington.

Background

Cleanup work at the Site is being implemented under Consent Decree No. 12202548-1 between BNSF and the Washington State Department of Ecology (Ecology). A soil and groundwater remediation system operated at the Site from March 2009 to May 2016. Ecology approved a request to shut down the remediation system and continue with a reduced groundwater monitoring schedule in a letter dated 26 January 2016.

Groundwater monitoring activities are conducted in accordance with the Compliance Monitoring Plan (CMP) included in the Engineering Design Report (EDR)[1]. As specified in the CMP, the reduced monitoring will be conducted on monitoring wells MW-6, MW 7, MW-14, and MW-19 (Fueling Area wells) for a minimum of four consecutive quarters. According to the CMP, groundwater monitoring "will be ceased in the Fueling Area wells after the remediation system has been shut down for one full year and laboratory data from four consecutive quarters of monitoring indicate diesel-range organics (DRO) and arsenic concentrations in groundwater samples are less than cleanup criteria." Four consecutive quarters of monitoring were conducted following the shutdown of the remediation system in 2016. In a letter dated 28 August 2017, BNSF requested that the frequency of groundwater monitoring and cap integrity inspections be reduced from quarterly to semiannual (second and fourth quarter each year). Ecology approved the proposed sampling reduction in a letter dated 25 September 2017.

[1] GeoEngineers. 2013. Engineering Design Report, BNSF Parkwater Rail Yard Site, Spokane, Washington.

Field Activities

The second semiannual 2018 groundwater sampling event was conducted on 5 December 2018. Groundwater monitoring activities included measuring depth-to-water in the four monitoring wells, then purging groundwater from each well using a stainless steel bladder pump, and collecting groundwater samples. Purging and sampling was conducted in general conformance with the U.S. Environmental Protection Agency's (EPA) low-flow groundwater sampling procedures[2]. Groundwater samples were collected in accordance with the requirements of the CMP, and stored in a cooler containing crushed ice until being delivered to Pace Analytical National Center for Testing & Innovation, of Mt. Juliet, Tennessee (Pace National), a Washington State-accredited environmental laboratory, under appropriate chain-of-custody. Samples were analyzed by Pace National for DRO by Method NWTPH-Dx, and total arsenic by EPA Method 6020.

Results

Depth-to-groundwater measurements and resulting groundwater elevation calculations are summarized in Table 1 and presented on Figure 1. Water quality parameters measured during purging are summarized in Table 2, and monitoring well purge forms are included in Attachment A. Analytical results are summarized in Table 3 and are presented on Figure 2 (arsenic and DRO) and Figure 3 (arsenic and turbidity), and the laboratory report is included in Attachment B.

Groundwater elevation measurements indicate a west to west-northwest groundwater flow direction with an average hydraulic gradient of 0.0022 feet per foot. This is consistent with the groundwater flow direction observed during previous monitoring events at the Site.

Reported concentrations of DRO in the samples collected during the last four consecutive sampling events (March 2017 through December 2018) have been below the Site-specific cleanup level of 0.5 milligrams per liter (mg/L). However, arsenic was reported in several samples at concentrations above its Site-specific cleanup level of 0.005 mg/L, likely due to elevated turbidity.

During the December 2018 sampling event, total arsenic was reported at a concentration of 0.0209 mg/L in the sample collected from monitoring well MW-6 and 0.00548 mg/L in the parent sample from well MW-14. Both results are above the Site-specific cleanup level established in the EDR of 0.005 mg/L. The turbidity measured in the sample collected from well MW-6 was 46.90 Nephelometric turbidity units (NTU), which is an order of magnitude higher than turbidity measured in that well during previous sampling events. The turbidity measured in the sample collected from well MW-14 was 7.80 NTU. Turbidity measurements in samples collected from wells MW-6, MW-7, MW-14, and MW-19 since March 2016 have typically been less than 5 NTU. Due to the elevated turbidity, the arsenic concentration reported in the sample collected

[2] U.S. Environmental Protection Agency, Region 1. 1996. Low Stress (low-flow) Purging and Sampling Procedure for the Collection of Ground Water Samples from Monitoring Wells, EPA SOP No. GW 0001, Revision No. 2, July 30.

from well MW-6 in December 2018 is likely not representative of groundwater quality beneath the Site.

Previous reported total arsenic concentrations above the Site-specific cleanup level are also generally associated with elevated turbidity in the associated samples, indicating that elevated arsenic concentrations are likely associated with the suspended sediment and not representative of groundwater quality. Groundwater samples collected with turbidity less than 5 NTU have reported total arsenic concentrations below the cleanup level in all but one of 23 samples. Elevated turbidity measurements above 5 NTU (up to 75.70 NTU in MW-19) have been observed in nine samples (one or more from wells MW-6, MW-14, and MW-19), with total arsenic concentrations above the EDR Site-specific cleanup level in five of the nine samples.

Summary

In the four consecutive sampling events conducted since March 2017, DRO concentrations have been below its Site-specific cleanup level in the four wells monitored. However, arsenic has been reported at concentrations above its Site-specific cleanup levels established in the EDR, as follows:

- Monitoring Well MW-6 – second semiannual 2018 event (elevated turbidity in sample)
- Monitoring Well MW-14 – first semiannual 2017 event (elevated turbidity in sample) and second semiannual 2018 event
- Monitoring Well MW-19 – first semiannual 2018 event (elevated turbidity in sample).

The elevated total arsenic results in 2017 and 2018 have coincided with elevated turbidity in Site groundwater samples. Kennedy Jenks recommends redeveloping the four site wells before the first semiannual event in 2019 and sampling for both total arsenic (unfiltered) and dissolved arsenic (field filtered) in future events if stabilized turbidity measurements are above 5 NTU at the time of sampling.

Please contact us at (253) 835-6400 if you have questions regarding the above information.

Very truly yours,

KENNEDY/JENKS CONSULTANTS

Ryan Hultgren
Project Engineer

Diane Tackett
Project Manager

cc: Shane DeGross, BNSF Railway Company

Attachments:

- Table 1 – Groundwater Elevation Summary 5 December 2018
- Table 2 – Water Quality Parameters Summary
- Table 3 – 2016-2018 Groundwater Analytical Results Summary
- Figure 1 – Groundwater Potentiometric Map, December 5, 2018
- Figure 2 – Groundwater Results Map, 2016-2018
- Figure 3 – Arsenic and Turbidity Trend Graphs, 2016-2018
- Attachment A – Spokane Environmental Services Monitoring Well Sampling Field Log
- Attachment B – Laboratory Analytical Report and Chain-of-Custody Documentation

Tables

TABLE 1

GROUNDWATER ELEVATION SUMMARY
5 December 2018
BNSF Parkwater Rail Yard
Spokane, Washington

Well Number	Date	Top of Casing Elevation (feet)[(a)]	Depth to Groundwater (feet btoc)	Groundwater Elevation (feet amsl)[(a)]
MW-4	12/5/2018	1,950.76	65.56	1,885.20
MW-6	12/5/2018	1,951.04	66.69	1,884.35
MW-7	12/5/2018	1,951.13	66.78	1,884.35
MW-11	12/5/2018	1,951.20	69.39	1,881.81
MW-14	12/5/2018	1,951.41	67.50	1,883.91
MW-16	12/5/2018	1,950.44	67.18	1,883.26
MW-19	12/5/2018	1,951.24	66.97	1,884.27

Notes:

(a) Elevations are referenced to the North American Vertical Datum of 1988 (NAVD 88).

btoc = below top of casing

amsl = above mean sea level

TABLE 2

WATER QUALITY PARAMETERS SUMMARY
BNSF Parkwater Rail Yard, Spokane, Washington

Monitoring Well ID	Sample Collection Date	Water Quality Parameters					
		pH	Conductivity (mS/cm)	Turbidity (NTU)	Temperature (°C)	Dissolved Oxygen (mg/L)	ORP (mV)
MW-6	3/15/2016	7.37	0.278	0.72	11.17	1.34	76.4
	5/24/2016	7.41	0.254	1.63	12.59	1.03	83.9
	8/17/2016	7.40	0.255	5.78	14.37	6.56	14.8
	11/7/2016	6.79	0.412	1.21	12.66	0.60	-20.1
	3/8/2017	7.22	0.265	2.46	10.22	1.82	44.9
	11/6/2017	7.18	0.232	2.74	11.03	2.91	72.5
	6/28/2018	7.57	0.286	0.00	15.77	0.00	35.0
	12/5/2018	6.98	0.301	46.90	11.09	1.33	243.0
MW-7	3/15/2016	7.70	0.252	2.82	11.37	5.32	101.8
	5/24/2016	7.69	0.250	2.45	12.95	7.69	-72.9
	8/17/2016	7.87	0.244	3.42	15.11	7.77	38.8
	11/7/2016	7.53	0.255	0.23	11.93	6.45	83.6
	3/8/2017	7.32	0.290	2.77	10.29	4.46	51.5
	11/6/2017	7.88	0.251	7.79	11.33	5.89	73.9
	6/28/2018	7.82	0.275	0.00	14.91	1.78	131.0
	12/5/2018	7.63	0.290	5.20	10.87	4.25	258.0
MW-14	3/15/2016	7.64	0.251	0.00	10.21	7.26	75.8
	5/24/2016	7.72	0.252	2.48	13.27	7.84	45.5
	8/17/2016	7.48	0.261	2.92	17.13	5.12	17.2
	11/7/2016	7.00	0.372	0.88	12.64	1.47	-24.3
	3/8/2017	7.14	0.265	11.71	9.35	7.11	65.3
	11/6/2017	7.52	0.289	13.59	8.96	3.58	33.3
	6/28/2018	8.02	0.261	0.00	17.12	5.15	173.0
	12/5/2018	7.21	0.339	7.80	10.58	1.98	155.0
MW-19	3/15/2016	7.90	0.243	1.43	11.06	9.25	114.3
	5/24/2016	7.91	0.242	1.25	13.17	9.72	81.5
	8/17/2016	7.71	0.251	1.47	17.05	8.45	40.7
	11/7/2016	7.57	0.256	1.37	12.20	7.96	114.9
	3/8/2017	7.54	0.252	4.41	10.12	9.21	59.5
	11/6/2017	7.72	0.255	5.67	10.63	7.53	78.6
	6/28/2018	7.97	0.264	75.70	12.28	0.60	125.0
	12/5/2018	7.55	0.285	1.60	10.74	4.59	287.0

Notes:

mS/cm = milli-Siemens per centimeter.

NTU = nephelometric turbidity units.

°C = degrees Celsius.

mg/L = milligrams per liter.

ORP = oxidation-reduction potential.

mV = millivolts.

TABLE 3

2016-2018 GROUNDWATER ANALYTICAL RESULTS SUMMARY
BNSF Parkwater Rail Yard, Spokane, Washington

Monitoring Well ID[a]	Date	Total Arsenic[b] (mg/L)		Dissolved Arsenic[b] (mg/L)		Diesel-Range Organics[c] (mg/L)		Turbidity (NTU)
MW-6	3/15/2016	0.002	U	0.002	U	0.488		0.72
	5/24/2016	0.002	U	--		0.201		1.63
	8/17/2016	**0.00505**		--		0.131	B	5.78
	11/7/2016	0.00450		--		**1.560**		1.21
	3/8/2017	0.00323		--		0.250	U	2.46
	11/6/2017	0.00139	J	--		0.095	J	2.74
	6/28/2018	0.00334		--		0.200	U	0.00
	12/5/2018	**0.02090**		--		0.096	J	46.90
MW-7	3/15/2016	0.00336		0.0032		0.153		2.82
	5/24/2016	0.00485		--		0.138		2.45
	8/17/2016	**0.00548**		--		0.100	U	3.42
	11/7/2016	0.00342		--		0.250	U	0.23
	3/8/2017	0.00200	U	--		0.250	U	2.77
	11/6/2017	0.00370		--		0.200	U	7.79
	6/28/2018	0.00388		--		0.200	U	0.00
	12/5/2018	0.00495		--		0.200	U	5.20
MW-14	3/15/2016	0.00283/0.00289[d]		0.00272/0.00279		0.1/0.1	U	0.00
	5/24/2016	0.00423/0.00397		--/--		0.1/0.1	U	2.48
	8/17/2016	0.00445/0.00371		--/--		0.1/0.112	U/B	2.42
	11/7/2016	0.00223/0.00225		--/--		**0.647/0.648**		0.88
	3/8/2017	**0.0104/0.0107**		--/--		0.250/0.250	U/U	11.71
	11/6/2017	0.00286/0.00295		--/--		0.200/0.200	U	13.59
	6/28/2018	0.00482/0.00474		--/--		0.200/0.200	U	0.00
	12/5/2018	**0.00548**/0.00331		--/--		0.200/0.200	U	7.80
MW-19	3/15/2016	0.00394		0.00455		0.100	U	1.43
	5/24/2016	0.00416		--		0.100	U	1.25
	8/17/2016	0.00367		--		0.100	U	1.47
	11/7/2016	0.00334		--		0.250	U	1.37
	3/8/2017	0.00387				0.250	U	4.41
	11/6/2017	0.00302		--		0.200	U	5.67
	6/28/2018	**0.00564**		--		0.200	U	75.70
	12/5/2018	0.00389		--		0.200	U	1.60
Field Blank	3/15/2016	0.002	U	0.002	U	0.100	U	--
	5/24/2016	0.002	U	--		0.100	U	--
	8/17/2016	0.002	U	--		0.100	U	--
	11/7/2016	0.002	U	--		0.250	U	--
	3/8/2017	0.002	U	--		0.250	U	--
Rinsate Blank	3/15/2016	0.002	U	0.002	U	0.100	U	--
	5/24/2016	0.002	U	--		0.218		--
	8/17/2016	0.002	U	--		0.100	U	--
	11/7/2016	0.002	U	--		0.250	U	--
	3/8/2017	0.002	U	--		0.250	U	--
EDR Site-Specific Cleanup Levels		0.005		0.005		0.5		--

Notes:

(a) Samples analyzed by ESC Lab Sciences Inc., Mt. Juliet, Tennessee (now Pace National).

(b) Total and dissolved arsenic analyzed using U.S. Environmental Protection Agency Method 6020.

(c) Diesel-range petroleum hydrocarbons analyzed using Northwest Method NWTPH-Dx with silica-gel cleanup during 2016, November 2017, and 2018 sampling events. Diesel-range petroleum hydrocarbons analyzed using Northwest Method NWTPH-Dx without silica-gel cleanup during the March 2017 sampling event.

(d) Where two values are displayed for the same date, the second value is the analytical result for a duplicate sample.

Bold indicates detected concentration exceeds the EDR Site-Specific cleanup level.

mg/L = milligrams per liter.

U = Not detected at a concentration greater than or equal to the listed laboratory reporting limit.

B = The sample analyte is found in the associated blank.

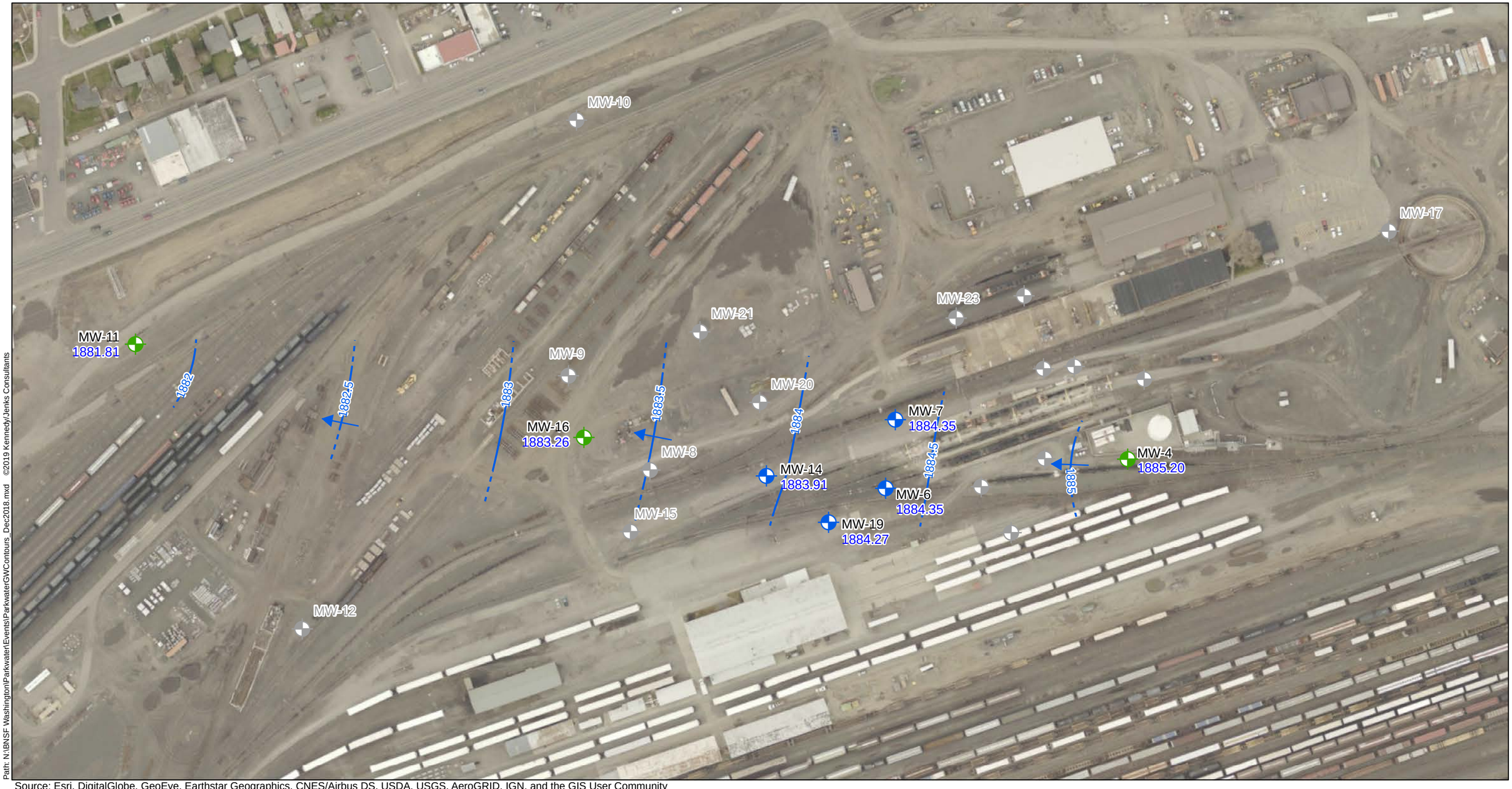
J = Analyte concentration is an estimated value less than the laboratory reporting limit.

-- = not sampled

Rinsate blank was collected by pumping distilled water through the sampling pump after it was decontaminated.

NTU = nephelometric turbidity units.

Figure



Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

Legend

- Monitoring Well, Groundwater Elevation, Sample Collected
- Monitoring Well, Groundwater Elevation Only
- Monitoring Well, Groundwater Not Measured
- 1883.91 Groundwater Elevation
- Groundwater Contour (Dashed Where Inferred)
- Approximate Direction of Hydraulic Flow
- Site Boundary

Note:

1. All locations are approximate.
2. Groundwater elevation measured in feet above mean sea level.
3. Groundwater elevations are relative to the NAVD 88 Datum.

N

0 75 150

Scale: Feet

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BNSF Railway Company
Parkwater Railyard
Spokane, Washington

Groundwater Potentiometric Map
December 5, 2018

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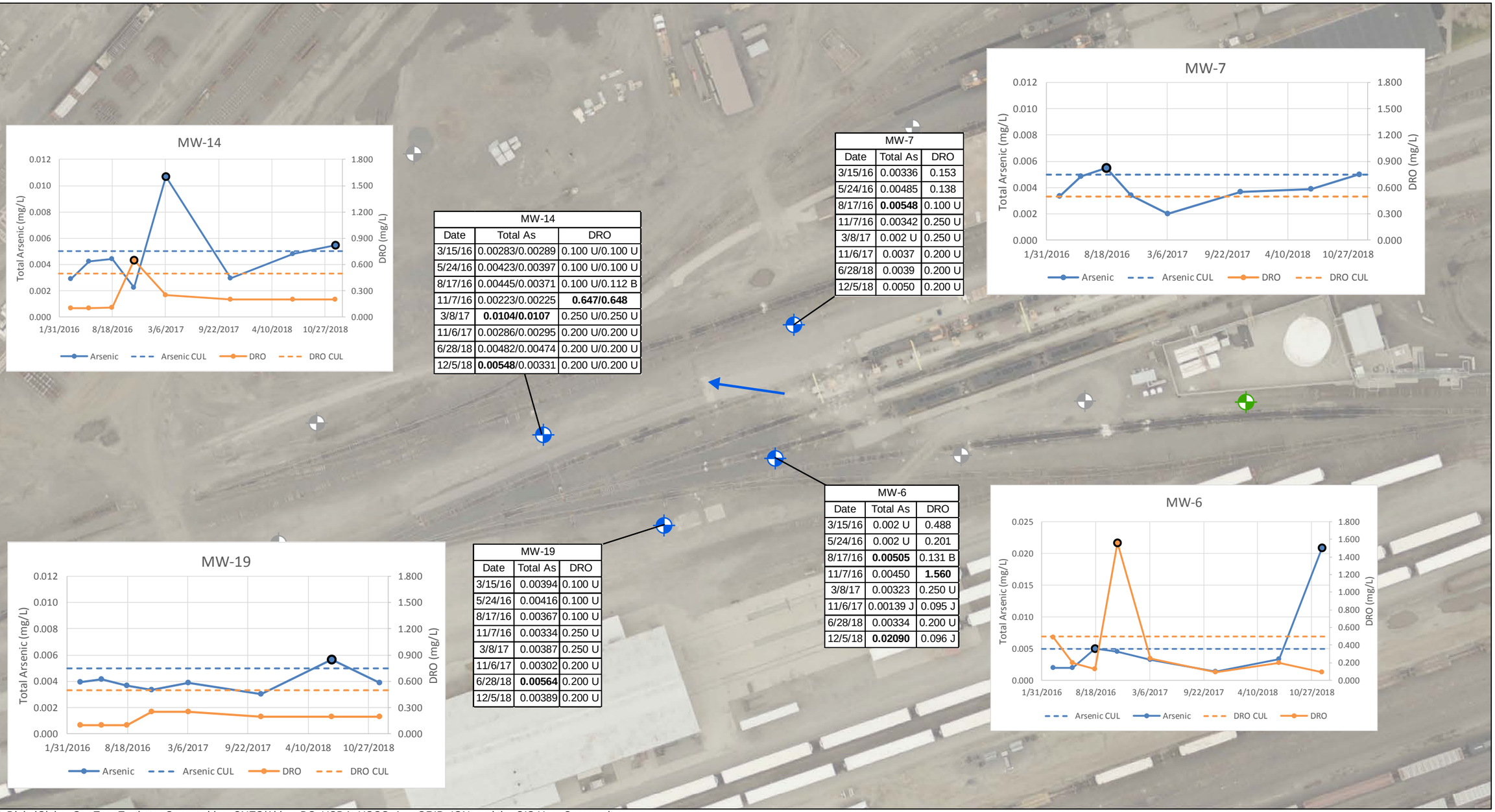
February 2019

Figure 1

Path: N:\BNSF Washington\Parkwater\Events\ParkwaterGWContours_Dec2018.mxd



MW-14		
Date	Total As	DRO
3/15/16	0.00283/0.00289	0.100 U/0.100 U
5/24/16	0.00423/0.00397	0.100 U/0.100 U
8/17/16	0.00445/0.00371	0.100 U/0.112 B
11/7/16	0.00223/0.00225	**0.647/0.648**
3/8/17	**0.0104/0.0107**	0.250 U/0.250 U
11/6/17	0.00286/0.00295	0.200 U/0.200 U
6/28/18	0.00482/0.00474	0.200 U/0.200 U
12/5/18	**0.00548**/0.00331	0.200 U/0.200 U

MW-7		
Date	Total As	DRO
3/15/16	0.00336	0.153
5/24/16	0.00485	0.138
8/17/16	**0.00548**	0.100 U
11/7/16	0.00342	0.250 U
3/8/17	0.002 U	0.250 U
11/6/17	0.0037	0.200 U
6/28/18	0.0039	0.200 U
12/5/18	0.0050	0.200 U

MW-19		
Date	Total As	DRO
3/15/16	0.00394	0.100 U
5/24/16	0.00416	0.100 U
8/17/16	0.00367	0.100 U
11/7/16	0.00334	0.250 U
3/8/17	0.00387	0.250 U
11/6/17	0.00302	0.200 U
6/28/18	**0.00564**	0.200 U
12/5/18	0.00389	0.200 U

MW-6		
Date	Total As	DRO
3/15/16	0.002 U	0.488
5/24/16	0.002 U	0.201
8/17/16	**0.00505**	0.131 B
11/7/16	0.00450	**1.560**
3/8/17	0.00323	0.250 U
11/6/17	0.00139 J	0.095 J
6/28/18	0.00334	0.200 U
12/5/18	**0.02090**	0.096 J

Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

Legend

- Monitoring Well, Groundwater Elevation, Sample Collected
- Monitoring Well, Groundwater Elevation Only
- Monitoring Well, Groundwater Not Measured
- Approximate Direction of Hydraulic Flow

Note:

1. All locations are approximate.
2. Groundwater results are in milligrams per liter (mg/L).
3. DRO = Diesel-Range Organics.
   Total As = Total Arsenic.
   CUL = Cleanup Level.
   U = Below the laboratory reporting limit.
   B = Analyte is found in the associated blank.
   J = Concentration is estimated value above the laboratory detection limit and less than the laboratory reporting limit.
4. Duplicate samples collected from MW-14.
5. Black outline on chart symbols indicates detected concentration exceeds the Site-Specific cleanup level for arsenic (0.005 mg/L) or DRO (0.5 mg/L).

N

0 40 80

Scale: Feet

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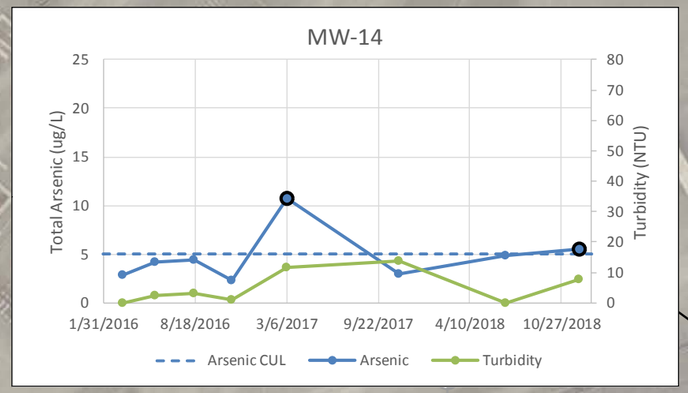
BNSF Railway Company
Parkwater Railyard
Spokane, Washington

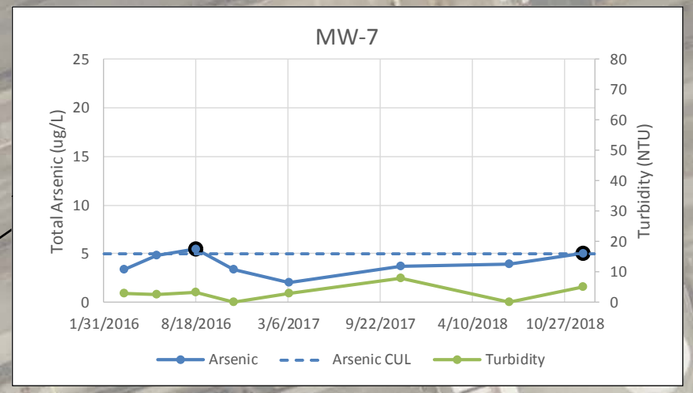
Groundwater Results Map 2016-2018

1896110*00
February 2019

Figure 2

Black outline on chart symbols indicate detected concentration exceeds the Site-Specific cleanup level for arsenic (0.005 mg/L).





Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

Legend

- Monitoring Well, Groundwater Elevation, Sample Collected
- Monitoring Well, Groundwater Elevation Only
- Monitoring Well, Groundwater Not Measured
- Approximate Direction of Hydraulic Flow

Note:

1. All locations are approximate.
2. Groundwater results are in milligrams per liter (mg/L).
3. Arsenic = Total Arsenic.
   CUL = Cleanup Level.
4. Duplicate samples collected from MW-14.
5. Black outline on chart symbols indicates detected concentration exceeds the Site-Specific cleanup level for arsenic (0.005 mg/L).

N

0 40 80

Scale: Feet

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BNSF Railway Company
Parkwater Railyard
Spokane, Washington

Arsenic and Turbidity Trend Graphs 2016-2018

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February 2019

Figure 3

Attachment A

Spokane Environmental Services Monitoring Well Sampling Field Log

Monitoring Well Sampling Field Log

Well Number: MW-6

Date:

Project Information	
Project Name:	KJ (BNSF)
SES Project Number:	0110-001

Sampling Information	
Field Team:	F I
Purge Method:	LOW FLOW
Sampling Method:	LOW FLOW
Water Quality Meter:	Model: U-52
	Serial Number:
Purge Water Disposition:	

Comments

TURBID
ORANGE color

Well Construction Information

Stick-up or Flush	Well Diameter (in)	Total Depth (ft btoc)	Screen Interval (ft bgs or btoc)
F	2		

Monitoring Information

Initial DTW (ft btoc)	Saturated Screen Interval (ft bgs or btoc)	Pump Intake Depth (ft btoc): (Mid Sat. Screen Interval)
66.69		

Sample Containers

Number	Type	Preservative	Analytical Parameters	Filtered?
1			AS8	
2			TPH DX	

Well Purge Data

Time	Volume Purged (L)	Purge Rate (L/min) (<0.5 L/min)	DTW (ft btoc)	Temp. (°C)	Conductivity (µS/cm)	D.O. (mg/L)	pH	ORP (mV)	Turbidity (NTUs)	Clarity/Color/ Remarks
	Pump On		Initial	-	±3%	±10%	±0.1	±10mv	±10%	<= Stabilization Criteria
11:30	7	0.250		11.18	0.301	1.50	7.22	212	48.6	
11:35				11.19	0.300	1.59	7.16	225	13.8	
11:40				11.18	0.301	1.37	7.12	227	10.5	
11:45				11.07	0.301	1.40	7.09	236	8.0	
11:50				11.08	0.301	1.65	7.01	242	46.2	
11:55				11.09	0.301	1.49	6.99	243	55.0	
12:00				11.09	0.301	1.33	6.98	243	46.9	

Start Sampling	11:00	Sample ID: PW-MW6-120518	Sample Time: 12:05
End Sampling		QA/QC Sample ID:	QA/QC Sample Time:

Note: bgs= below ground surface btoc=below top of casing DTW=depth to water
Clarity: VC=very cloudy Cl=cloudy SC=slightly cloudy AC=almost clear C=clear CC=crystal clear

PW-MW6-120518 @ 12:05

Monitoring Well Sampling Field Log

SPOKANE ENVIRONMENTAL SOLUTIONS

Well Number: MW-19

Date: 12/05/18

Project Information	
Project Name:	KJ (BNSF)
SES Project Number:	0110-001

Sampling Information	
Field Team:	FI
Purge Method:	Low Flow
Sampling Method:	Low Flow
Water Quality Meter:	Model: U-52
	Serial Number:
Purge Water Disposition:	

Comments

purge water : TURBID w/ ORANGE colour SAND

Well Construction Information

Stick-up or Flush	Well Diameter (in)	Total Depth (ft btoc)	Screen Interval (ft bgs or btoc)
F	2		

Monitoring Information

Initial DTW (ft btoc)	Saturated Screen Interval (ft bgs or btoc)	Pump Intake Depth (ft btoc): (Mid Sat. Screen Interval)
66.97		

Sample Containers

Number	Type	Preservative	Analytical Parameters	Filtered?
1			~~1s8~~	
2			NWTPH Dx	

Well Purge Data

Time	Volume Purged (L)	Purge Rate (L/min) (<0.5 L/min)	DTW (ft btoc)	Temp. (°C)	Conductivity (µS/cm)	D.O. (mg/L)	pH	ORP (mV)	Turbidity (NTUs)	Clarity/Color/ Remarks
	Pump On		Initial	-	±3%	±10%	±0.1	±10mv	±10%	<= Stabilization Criteria
9:45	5	0.250		10.83	0.286	5.42	7.85	281	43.0	
9:50		"		10.79	0.285	5.38	7.65	286	26.7	
9:55		"		10.74	0.284	4.99	7.57	286	6.1	
10:00				10.68	0.285	5.02	7.56	287	3.5	
10:05				10.70	0.285	4.68	7.54	288	2.6	
10:10				10.68	0.286	5.27	7.54	288	2.1	
10:15				10.71	0.285	4.78	7.55	287	1.7	
10:20				10.71	0.285	4.78	7.55	287	1.6	
10:25				10.74	0.285	4.59	7.55	287	1.6	

Start Sampling	9:00	Sample ID:	PW-MW19-120518
End Sampling	10:25	QA/QC Sample ID:	
		Sample Time:	10:25
		QA/QC Sample Time:	

Note: bgs= below ground surface btoc=below top of casing DTW=depth to water
Clarity: VC=very cloudy Cl=cloudy SC=slightly cloudy AC=almost clear C=clear CC=crystal clear

PW-MW19-120518 @ ~~10:10~~ 10:25

Monitoring Well Sampling Field Log

SPOKANE ENVIRONMENTAL SOLUTIONS

Well Number: MW-14

Date: 12/05/18

Project Information	
Project Name:	KJ (BNSF)
SES Project Number:	0110-001

Sampling Information	
Field Team:	~~GP~~ FI
Purge Method:	Low Flow
Sampling Method:	Low Flow
Water Quality Meter:	Model: U-52
	Serial Number:
Purge Water Disposition:	OWS

Comments

purge water Turbid orange colloud sand
* ONE OF THE VOA FROM THE DUPLICATE CONTAINED METHANOL - VOA WAS RINSED

Well Construction Information

Stick-up or Flush	Well Diameter (in)	Total Depth (ft btoc)	Screen Interval (ft bgs or btoc)
F	2		

Monitoring Information

Initial DTW (ft btoc)	Saturated Screen Interval (ft bgs or btoc)	Pump Intake Depth (ft btoc): (Mid Sat. Screen Interval)
67.50		

Sample Containers

Number	Type	Preservative	Analytical Parameters	Filtered?
1			As	
2			TPH DX	

Well Purge Data

Time	Volume Purged (L)	Purge Rate (L/min) (<0.5 L/min)	DTW (ft btoc)	Temp. (°C)	Conductivity (uS/cm)	D.O. (mg/L)	pH	ORP (mV)	Turbidity (NTUs)	Clarity/Color/ Remarks
	Pump On		Initial	-	±3%	±10%	±0.1	±10mv	±10%	<= Stabilization Criteria
14:05	5			9.33	0.337	3.14	7.33	255	110	
14:10				10.26	0.336	2.96	7.36	195	31.6	
14:15				10.53	0.336	2.20	7.27	171	84.7	
14:20				10.46	0.337	2.40	7.28	168	40.0	
14:25				10.62	0.337	2.01	7.26	161	21.8	
14:30				10.55	0.340	2.0	7.23	156	9.5	
14:35				10.35	0.340	1.98	7.22	155	8.0	
14:40				10.55	0.339	1.90	7.23	155	6.0	
14:45				10.58	0.339	1.98	7.21	155	7.8	

Start Sampling	13:40	Sample ID:	PW-MW14-120518
End Sampling		QA/QC Sample ID:	PW-DUP-120518
		Sample Time:	14:45
		QA/QC Sample Time:	11:40

Note: bgs= below ground surface btoc=below top of casing DTW=depth to water
Clarity: VC=very cloudy Cl=cloudy SC=slightly cloudy AC=almost clear C=clear CC=crystal clear

PW-MW14-120518 @ 14:45

PW-DUP-120518 @ 11:40

Monitoring Well Sampling Field Log

SPOKANE ENVIRONMENTAL SOLUTIONS

Well Number: MW-07

Date: 12/05/18

Project Information	
Project Name:	KJ (BNSF)
SES Project Number:	0110-001

Sampling Information	
Field Team:	
Purge Method:	
Sampling Method:	
Water Quality Meter:	Model: U-52
	Serial Number:
Purge Water Disposition:	

Comments

Turbid w/ orange color sand

Well Construction Information

Stick-up or Flush	Well Diameter (in)	Total Depth (ft btoc)	Screen Interval (ft bgs or btoc)
F	2		

Monitoring Information

Initial DTW (ft btoc)	Saturated Screen Interval (ft bgs or btoc)	Pump Intake Depth (ft btoc): (Mid Sat. Screen Interval)
66.78		

Sample Containers

Number	Type	Preservative	Analytical Parameters	Filtered?
1			~~TSS~~ TPH-Dx	
2				

Well Purge Data

Time	Volume Purged (L)	Purge Rate (L/min) (<0.5 L/min)	DTW (ft btoc)	Temp. (°C)	Conductivity (~~µS/cm~~ mS)	D.O. (mg/L)	pH	ORP (mV)	Turbidity (NTUs)	Clarity/Color/ Remarks
	Pump On		Initial	-	±3%	±10%	±0.1	±10mv	±10%	<= Stabilization Criteria
12:50	2			10.18	0.285	5.78	7.17	244	6.0	
12:55				10.65	0.290	4.46	7.38	245	12.7	
13:00				10.75	0.290	4.59	7.47	248	8.0	
13:05				10.84	0.290	4.43	7.56	251	5.3	
13:10				10.84	0.290	4.52	7.59	253	5.1	
13:15				10.87	0.290	4.25	7.63	258	5.2	

Start Sampling 12:30	Sample ID: PW-MW07-120518	Sample Time: 13:15	
End Sampling	QA/QC Sample ID:	QA/QC Sample Time:	

Note: bgs= below ground surface btoc=below top of casing DTW=depth to water
Clarity: VC=very cloudy Cl=cloudy SC=slightly cloudy AC=almost clear C=clear CC=crystal clear

PW-MW7-120518 @ 13:15

F1 12/05/18

BNSF PARKWATER GWM

MW 4 -	08:45	65.56
MW 19 -	09:00	66.97
MW 06	11:00	66.69
MW 07	12:30	66.78
MW 14	13:40	67.50
MW 16	15:11	67.18
MW 11	15:15	69.39

Rite in the Rain

	MONTHLY INSPECTION LOG	File Number
	Project HILLYARD DROSS CAP 3400 E Wellesley, SPOKANE	Date 12/07/18
	Owner BNSF	Site Map on Reverse

Staff Participating	Temperature	Arrival	
Flavio	25° F	12:30	
Prepared By	Weather Conditions	Departure	
Flavio	SUNNY	12:45	

SYSTEM COMPONENT		CONDITIONS		Notes/Urgency	Recommended Action
		GOOD	BAD		
Fence	Chain Link	✓			
	Barbed Wire	✓			
	Gates	✓			
Cap Soil and Vegetation	East Quadrant	✓			
	North Quadrant	✓			
	West Quadrant	✓			
	South Quadrant	✓			
Stormwater System	Pond	✓		FROZEN	GAGE READS AT ± 15 feet
	W Sump/Pump			DRY	
	West Sump/Level			DRY	
	West Sump Intake			DRY	
	Overflow Sump			DRY	
	Drywell	✓			
Other Systems	Electrical	✓			
	Meter/Reading	✓		2189 Kw/hr	
	Monitoring Wells				
	Roads	✓			

		YES	NO	Notes/Urgency	Recommended Action
Restrictive Covenant	Unauthorized Access		✓		
	Unauthorized Excavations		✓		
	Unauthorized Wells		✓		
	Unauthorized Water Withdrawls		✓		
	Unauthorized Uses/Activities		✓		

Notes

There were 2 55gl DRUM by SE GATE

Use Back for Additional Comments

Signature

Date 12/07/18

ANNUAL INSPECTION LOG

Project: PARK WATER Rail yard - Soil RESTRICTION AREA (EAST & WEST DEBRIS AREA) EAST WEST	Project Number
	Date 12/06/18

Staff Participating FLAVIO	Temperature 20° F	Arrival 10:20
Prepared By FLAVIO	Weather Conditions SUNNY	Departure 10:30

COMPONENT	YES	NO	NOTES	RECOMMENDED ACTION
Excavations		✓		
Geotextile Fabric Damage		✓		
Geotextile Fabric Degradation		✓		
Soil/Gravel Erosion		✓		
Poor Drainage/Puddles		✓		
Animal Burrows		✓		
Vandalism		✓		
Structures	✓		single small building at center of cap AREA	
Stored Objects		✓		
Stored Equipment		✓		
Fence Damage	✓	·	CABLE ON SW CORNER BROKEN	

NOTES

- some scattered weed growing on cap
- See pictures

Signature

Date 12/06/18

ANNUAL INSPECTION LOG

Project: PARK Water Yard. Former KOCH AREA	Project Number
	Date 12/06/18

Staff Participating Flavio	Temperature 20° F	Arrival 10:35
Prepared By FLÁVIO	Weather Conditions SUNNY	Departure 10:40

COMPONENT	YES	NO	NOTES	RECOMMENDED ACTION
Excavations		✓		
Geotextile Fabric Damage		✓		
Geotextile Fabric Degradation		✓		
Soil/Gravel Erosion		✓		
Poor Drainage/Puddles		✓		
Animal Burrows		✓		
Vandalism		✓		
Structures	✓		STORAGE BUILDING AT NORTH BOUNDARY	
Stored Objects	✓		SNOW plows	
Stored Equipment	✓		TRAILERS, TRUCKS,	
Fence Damage				

NOTES

Signature Flavio Falcão

Date 12/06/18

Kennedy/Jenks Con-BNSF Region 1

32001 32nd Ave S.
Suite 100
Federal Way, WA 98001

Billing Information:
Accounts Payable
32001 32nd Ave. S.,Ste. 100
Federal Way, WA 98001

Pres Chk

Analysis / Container / Preservative

Chain of Custody Page ___ of ___

Pace Analytical® National Center for Testing & Innovation

12065 Lebanon Rd
Mount Juliet, TN 37122
Phone: 615-758-5858
Phone: 800-767-5859
Fax: 615-758-5859

Report to: **Ryan Hultgren** & DIANE TACKETT

Email To: **ryanhultgren@KennedyJenks.com** DIANETACKETT@KENNEDYJENKS.com

Project Description: **BNSF Hillyard Dross**

City/State Collected: SPOKANE WA

Phone: **253-835-6432**
Fax:

Client Project # 1896110.00

Lab Project # **BNSF1KEN-HILLYARD**

Collected by (print): Flavio

Site/Facility ID #

P.O. #

Collected by (signature): [signature]

Immediately Packed on Ice N___ Y ✓

Rush? (Lab MUST Be Notified)
___ Same Day ___ Five Day
___ Next Day ___ 5 Day (Rad Only)
___ Two Day ___ 10 Day (Rad Only)
___ Three Day

Quote #

Date Results Needed: STANDARD TA

L #
Table #
Acctnum: **BNSF1KEN**
Template: **T143351**
Prelogin: **P682243**
TSR: **134 - Mark W. Beasley**
PB:
Shipped Via:

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	ASG 250mlHDPE-HNO3	NWTPHDXLVI 40mlAmb-HCl-BT									Remarks	Sample # (lab only)
PW-MW7-120518		GW		12/05/18	13:15	3	X	X										
PW-MW6-120518		GW		12/05/18	12:05	3	X	X										
PW-DUP-120518		GW		12/05/18	11:40	3	X	X										
PW-MW14-120518		GW		12/05/18	14:45	3	X	X										
PW-MW19-120518		GW		12/05/18	10:25	3	X	X										
		GW				3	X	X										
		GW				3	X	X										

* Matrix:
SS - Soil AIR - Air F - Filter
GW - Groundwater B - Bioassay
WW - WasteWater
DW - Drinking Water
OT - Other______

Remarks: PW-DUP-120518 - one of the VOG PRESERVATIVE WAS METHANOL, VOA WAS RINSED PRIOR TO SAMPLE. ~~SOME~~ VOA CONTAINED METHANOL INSTEAD OF HCL.

pH ______ Temp ______
Flow ______ Other ______

Samples returned via:
__ UPS __ FedEx __ Courier ______

Tracking #

Sample Receipt Checklist
COC Seal Present/Intact: _NP _Y _N
COC Signed/Accurate: _Y _N
Bottles arrive intact: _Y _N
Correct bottles used: _Y _N
Sufficient volume sent: _Y _N
If Applicable
VOA Zero Headspace: _Y _N
Preservation Correct/Checked: _Y _N

Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)	Trip Blank Received: Yes / No HCL / MeoH TBR	
[signature]	12/05/18	16:48			
Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)	Temp: °C Bottles Received:	If preservation required by Login: Date/Time
Relinquished by : (Signature)	Date:	Time:	Received for lab by: (Signature)	Date: Time:	Hold: Condition: NCF / OK

Attachment B

Laboratory Analytical Report and Chain-of-Custody Documentation

Pace Analytical®
National Center for Testing & Innovation

ANALYTICAL REPORT

February 20, 2019

Kennedy/Jenks Con-BNSF Region 1

Sample Delivery Group:	L1050550
Samples Received:	12/06/2018
Project Number:	1896110.00
Description:	BNSF - Parkwater, WA

Report To: Ryan Hultgren
421 SW 6th Avenue, Suite 1000
Portland, OR 97204

Entire Report Reviewed By:

Mark W. Beasley
Project Manager

Results relate only to the items tested or calibrated and are reported as rounded values. This test report shall not be reproduced, except in full, without written approval of the laboratory. Where applicable, sampling conducted by Pace National is performed per guidance provided in laboratory standard operating procedures: 060302, 060303, and 060304.

TABLE OF CONTENTS

PW-MW7-120518 L1050550-01 GW

Collected by: Flavio Ishihara | Collected date/time: 12/05/18 13:15 | Received date/time: 12/06/18 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Metals (ICPMS) by Method 6020B	WG1207244	1	12/10/18 16:11	12/10/18 22:46	LAT
Semi-Volatile Organic Compounds (GC) by Method NWTPHDX-SGT	WG1208455	1	12/11/18 09:05	12/12/18 16:16	SHG

PW-MW6-120518 L1050550-02 GW

Collected by: Flavio Ishihara | Collected date/time: 12/05/18 12:05 | Received date/time: 12/06/18 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Metals (ICPMS) by Method 6020B	WG1207244	1	12/10/18 16:11	12/10/18 22:50	LAT
Semi-Volatile Organic Compounds (GC) by Method NWTPHDX-SGT	WG1208455	1	12/11/18 09:05	12/12/18 16:37	SHG

PW-DUP-120518 L1050550-03 GW

Collected by: Flavio Ishihara | Collected date/time: 12/05/18 11:40 | Received date/time: 12/06/18 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Metals (ICPMS) by Method 6020B	WG1207244	1	12/10/18 16:11	12/10/18 22:55	LAT
Semi-Volatile Organic Compounds (GC) by Method NWTPHDX-SGT	WG1208455	1	12/11/18 09:05	12/12/18 16:59	SHG

PW-MW14-120518 L1050550-04 GW

Collected by: Flavio Ishihara | Collected date/time: 12/05/18 14:45 | Received date/time: 12/06/18 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Metals (ICPMS) by Method 6020B	WG1207244	1	12/10/18 16:11	12/10/18 23:00	LAT
Semi-Volatile Organic Compounds (GC) by Method NWTPHDX-SGT	WG1208455	1	12/11/18 09:05	12/12/18 17:21	SHG

PW-MW19-120518 L1050550-05 GW

Collected by: Flavio Ishihara | Collected date/time: 12/05/18 10:25 | Received date/time: 12/06/18 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Metals (ICPMS) by Method 6020B	WG1207244	1	12/10/18 16:11	12/10/18 23:04	LAT
Semi-Volatile Organic Compounds (GC) by Method NWTPHDX-SGT	WG1208455	1	12/11/18 09:05	12/12/18 17:43	SHG

All sample aliquots were received at the correct temperature, in the proper containers, with the appropriate preservatives, and within method specified holding times, unless qualified or notated within the report. Where applicable, 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
Project Manager

Metals (ICPMS) by Method 6020B

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	ug/l		ug/l	ug/l		date / time	
Arsenic	4.95		0.250	2.00	1	12/10/2018 22:46	WG1207244

Semi-Volatile Organic Compounds (GC) by Method NWTPHDX-SGT

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	ug/l		ug/l	ug/l		date / time	
Diesel Range Organics (DRO)	U		66.7	200	1	12/12/2018 16:16	WG1208455
Residual Range Organics (RRO)	U		83.3	250	1	12/12/2018 16:16	WG1208455
(S) o-Terphenyl	*60.5*			*52.0-156*		*12/12/2018 16:16*	WG1208455

Metals (ICPMS) by Method 6020B

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	ug/l		ug/l	ug/l		date / time	
Arsenic	20.9		0.250	2.00	1	12/10/2018 22:50	WG1207244

Semi-Volatile Organic Compounds (GC) by Method NWTPHDX-SGT

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	ug/l		ug/l	ug/l		date / time	
Diesel Range Organics (DRO)	95.7	J	66.7	200	1	12/12/2018 16:37	WG1208455
Residual Range Organics (RRO)	U		83.3	250	1	12/12/2018 16:37	WG1208455
(S) o-Terphenyl	*58.4*			*52.0-156*		*12/12/2018 16:37*	WG1208455

Metals (ICPMS) by Method 6020B

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	ug/l		ug/l	ug/l		date / time	
Arsenic	3.31		0.250	2.00	1	12/10/2018 22:55	WG1207244

Semi-Volatile Organic Compounds (GC) by Method NWTPHDX-SGT

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	ug/l		ug/l	ug/l		date / time	
Diesel Range Organics (DRO)	U		66.7	200	1	12/12/2018 16:59	WG1208455
Residual Range Organics (RRO)	U		83.3	250	1	12/12/2018 16:59	WG1208455
(S) o-Terphenyl	*56.8*			*52.0-156*		*12/12/2018 16:59*	WG1208455

Metals (ICPMS) by Method 6020B

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	ug/l		ug/l	ug/l		date / time	
Arsenic	5.48		0.250	2.00	1	12/10/2018 23:00	WG1207244

Semi-Volatile Organic Compounds (GC) by Method NWTPHDX-SGT

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	ug/l		ug/l	ug/l		date / time	
Diesel Range Organics (DRO)	U		66.7	200	1	12/12/2018 17:21	WG1208455
Residual Range Organics (RRO)	U		83.3	250	1	12/12/2018 17:21	WG1208455
(S) o-Terphenyl	*61.6*			*52.0-156*		*12/12/2018 17:21*	WG1208455

Metals (ICPMS) by Method 6020B

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	ug/l		ug/l	ug/l		date / time	
Arsenic	3.89		0.250	2.00	1	12/10/2018 23:04	WG1207244

Semi-Volatile Organic Compounds (GC) by Method NWTPHDX-SGT

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	ug/l		ug/l	ug/l		date / time	
Diesel Range Organics (DRO)	U		66.7	200	1	12/12/2018 17:43	WG1208455
Residual Range Organics (RRO)	U		83.3	250	1	12/12/2018 17:43	WG1208455
(S) o-Terphenyl	*58.9*			*52.0-156*		*12/12/2018 17:43*	WG1208455

Method Blank (MB)

(MB) R3366952-1 12/10/18 21:12

Analyte	MB Result	MB Qualifier	MB MDL	MB RDL
	ug/l		ug/l	ug/l
Arsenic	U		0.250	2.00

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

(LCS) R3366952-2 12/10/18 21:17 • (LCSD) R3366952-3 12/10/18 21:22

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	%	%	%			%	%
Arsenic	50.0	47.5	48.2	95.0	96.4	80.0-120			1.51	20

L1050516-04 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1050516-04 12/10/18 21:26 • (MS) R3366952-5 12/10/18 21:35 • (MSD) R3366952-6 12/10/18 21:40

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	%	%		%			%	%
Arsenic	50.0	57.7	4670	4740	205	208	45	75.0-125	J5	J5	1.44	20

Method Blank (MB)

(MB) R3367491-1 12/11/18 22:19

Analyte	MB Result	MB Qualifier	MB MDL	MB RDL
	ug/l		ug/l	ug/l
Diesel Range Organics (DRO)	U		66.7	200
Residual Range Organics (RRO)	U		83.3	250
(S) o-Terphenyl	*58.5*			*52.0-156*

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

(LCS) R3367491-2 12/11/18 22:39 • (LCSD) R3367491-3 12/11/18 22:59

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	640	643	85.3	85.7	50.0-150			0.468	20
Residual Range Organics (RRO)	750	501	504	66.8	67.2	50.0-150			0.597	20
(S) o-Terphenyl				*74.5*	*72.0*	*52.0-156*				

Guide to Reading and Understanding Your Laboratory Report

The information below is designed to better explain the various terms used in your report of analytical results from the Laboratory. This is not intended as a comprehensive explanation, and if you have additional questions please contact your project representative.

Abbreviations and Definitions

MDL	Method Detection Limit.
RDL	Reported Detection Limit.
Rec.	Recovery.
RPD	Relative Percent Difference.
SDG	Sample Delivery Group.
(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.
U	Not detected at the Reporting Limit (or MDL where applicable).
Analyte	The name of the particular compound or analysis performed. Some Analyses and Methods will have multiple analytes reported.
Dilution	If the sample matrix contains an interfering material, the sample preparation volume or weight values differ from the standard, or if concentrations of analytes in the sample are higher than the highest limit of concentration that the laboratory can accurately report, the sample may be diluted for analysis. If a value different than 1 is used in this field, the result reported has already been corrected for this factor.
Limits	These are the target % recovery ranges or % difference value that the laboratory has historically determined as normal for the method and analyte being reported. Successful QC Sample analysis will target all analytes recovered or duplicated within these ranges.
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.
Qualifier	This column provides a letter and/or number designation that corresponds to additional information concerning the result reported. If a Qualifier is present, a definition per Qualifier is provided within the Glossary and Definitions page and potentially a discussion of possible implications of the Qualifier in the Case Narrative if applicable.
Result	The actual analytical final result (corrected for any sample specific characteristics) reported for your sample. If there was no measurable result returned for a specific analyte, the result in this column may state “ND” (Not Detected) or “BDL” (Below Detectable Levels). The information in the results column should always be accompanied by either an MDL (Method Detection Limit) or RDL (Reporting Detection Limit) that defines the lowest value that the laboratory could detect or report for this analyte.
Uncertainty (Radiochemistry)	Confidence level of 2 sigma.
Case Narrative (Cn)	A brief discussion about the included sample results, including a discussion of any non-conformances to protocol observed either at sample receipt by the laboratory from the field or during the analytical process. If present, there will be a section in the Case Narrative to discuss the meaning of any data qualifiers used in the report.
Quality Control Summary (Qc)	This section of the report includes the results of the laboratory quality control analyses required by procedure or analytical methods to assist in evaluating the validity of the results reported for your samples. These analyses are not being performed on your samples typically, but on laboratory generated material.
Sample Chain of Custody (Sc)	This is the document created in the field when your samples were initially collected. This is used to verify the time and date of collection, the person collecting the samples, and the analyses that the laboratory is requested to perform. This chain of custody also documents all persons (excluding commercial shippers) that have had control or possession of the samples from the time of collection until delivery to the laboratory for analysis.
Sample Results (Sr)	This section of your report will provide the results of all testing performed on your samples. These results are provided by sample ID and are separated by the analyses performed on each sample. The header line of each analysis section for each sample will provide the name and method number for the analysis reported.
Sample Summary (Ss)	This section of the Analytical Report defines the specific analyses performed for each sample ID, including the dates and times of preparation and/or analysis.

Qualifier	Description
J	The identification of the analyte is acceptable; the reported value is an estimate.
J5	The sample matrix interfered with the ability to make any accurate determination; spike value is high.

Pace National 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.
* Accreditation is only applicable to the test methods specified on each scope of accreditation held by Pace National.

State Accreditations

Alabama	40660	Nebraska	NE-OS-15-05
Alaska	17-026	Nevada	TN-03-2002-34
Arizona	AZ0612	New Hampshire	2975
Arkansas	88-0469	New Jersey–NELAP	TN002
California	2932	New Mexico [1]	n/a
Colorado	TN00003	New York	11742
Connecticut	PH-0197	North Carolina	Env375
Florida	E87487	North Carolina [1]	DW21704
Georgia	NELAP	North Carolina [3]	41
Georgia [1]	923	North Dakota	R-140
Idaho	TN00003	Ohio–VAP	CL0069
Illinois	200008	Oklahoma	9915
Indiana	C-TN-01	Oregon	TN200002
Iowa	364	Pennsylvania	68-02979
Kansas	E-10277	Rhode Island	LAO00356
Kentucky [1 6]	90010	South Carolina	84004
Kentucky [2]	16	South Dakota	n/a
Louisiana	AI30792	Tennessee [1 4]	2006
Louisiana [1]	LA180010	Texas	T104704245-18-15
Maine	TN0002	Texas [5]	LAB0152
Maryland	324	Utah	TN00003
Massachusetts	M-TN003	Vermont	VT2006
Michigan	9958	Virginia	460132
Minnesota	047-999-395	Washington	C847
Mississippi	TN00003	West Virginia	233
Missouri	340	Wisconsin	9980939910
Montana	CERT0086	Wyoming	A2LA

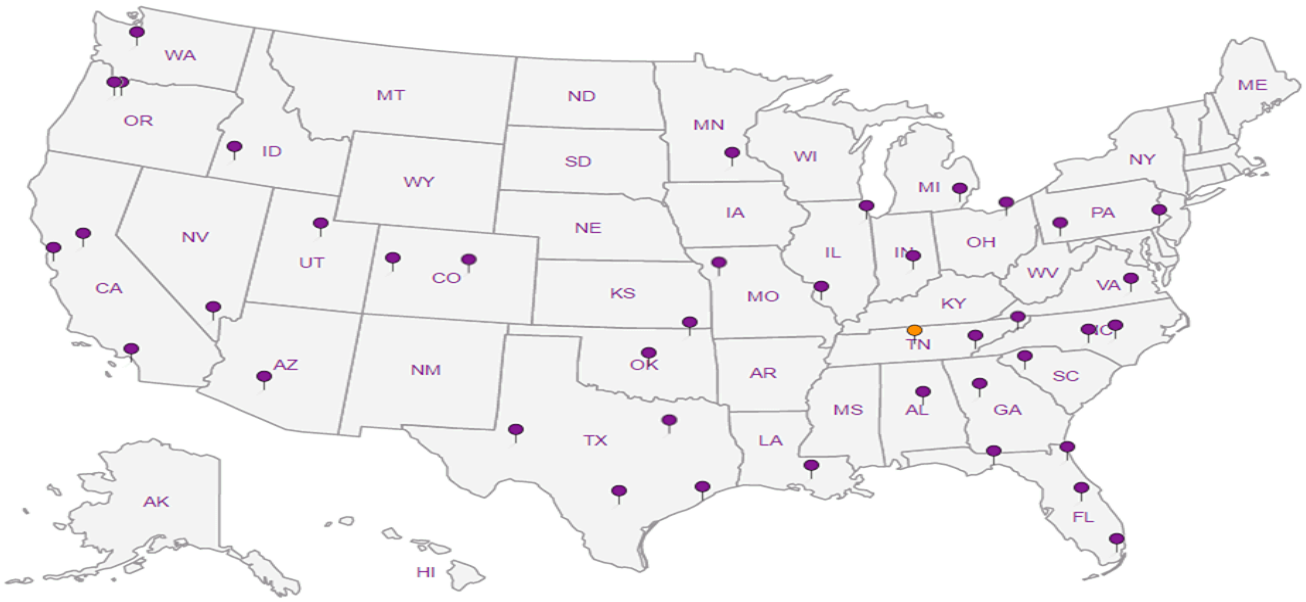
Third Party Federal Accreditations

A2LA – ISO 17025	1461.01	AIHA-LAP,LLC EMLAP	100789
A2LA – ISO 17025 [5]	1461.02	DOD	1461.01
Canada	1461.01	USDA	P330-15-00234
EPA–Crypto	TN00003		

[1] Drinking Water [2] Underground Storage Tanks [3] Aquatic Toxicity [4] Chemical/Microbiological [5] Mold [6] Wastewater n/a Accreditation not applicable

Our Locations

Pace National 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. Pace National performs all testing at our central laboratory.



Kennedy/Jenks Con-BNSF Region 1

32001 32nd Ave S.
Suite 100
Federal Way, WA 98001

Billing Information:
Accounts Payable
32001 32nd Ave. S.,Ste. 100
Federal Way, WA 98001

Report to: Ryan Hultgren & DIANE TACKETT

Email To: ryanhultgren@KennedyJenks.com
DIANETACKETT@KENNEDYJENKS.COM

Project Description: BNSF Hillyard Dross

City/State Collected: SPOKANE WA

Phone: 253-835-6432
Fax:

Client Project # 1896110.00

Lab Project # BNSF1KEN-HILLYARD

Collected by (print): Flavio

Site/Facility ID #

P.O. #

Collected by (signature):

Immediately Packed on Ice N ___ Y ✓

Rush? (Lab MUST Be Notified)
___ Same Day ___ Five Day
___ Next Day ___ 5 Day (Rad Only)
___ Two Day ___ 10 Day (Rad Only)
___ Three Day

Quote #

Date Results Needed: STANDARD TA

Pres Chk: C2

Analysis / Container / Preservative

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	ASG 250mlHDPE-HNO3	NWTPHDXLVI 40mlAmb-HCl-BT	Remarks	Sample # (lab only)
PW-MW7-120518		GW		12/05/18	13:15	3	X	X		-01
PW-MW6-120518		GW		12/05/18	12:05	3	X	X		-02
PW-DUP-120518		GW		12/05/18	11:40	3	X	X		-03
PW-MW14-120518		GW		12/05/18	14:45	3	X	X		-04
PW-MW19-120518		GW		12/05/18	10:25	3	X	X		-05
		GW				3	X	X		
		GW				3	X	X		

RAD SCREEN: <0.5 mR/hr

Chain of Custody Page ___ of ___

Pace Analytical®
National Center for Testing & Innovation

12065 Lebanon Rd
Mount Juliet, TN 37122
Phone: 615-758-5858
Phone: 800-767-5859
Fax: 615-758-5859

L# L1050550
B218
Ta
Acctnum: BNSF1KEN
Template: T143351
Prelogin: P682243
TSR: 134 - Mark W. Beasley
PB:
Shipped Via:

* Matrix:
SS - Soil AIR - Air F - Filter
GW - Groundwater B - Bioassay
WW - WasteWater
DW - Drinking Water
OT - Other_____

Remarks: - PW-DUP-120518 - one of the VOA PRESERVATIVE WAS METHANOL, VOA WAS RINSED pH _____ Temp _____
DRION TO sample ~~5 OUT OF 9 VOA CONTAINERS~~ METHANOL INSTEAD OF HCL. Flow _____ Other _____

Samples returned via:
__ UPS __ FedEx __ Courier _____

Tracking # 4685 6470 2636

Sample Receipt Checklist

COC Seal Present/Intact:	NP	✓Y N
COC Signed/Accurate:		✓Y N
Bottles arrive intact:		✓Y N
Correct bottles used:		✓Y N
Sufficient volume sent:		✓Y N
If Applicable		
VOA Zero Headspace:		Y N
Preservation Correct/Checked:		✓Y N

Relinquished by : (Signature)	Date: 12/05/18	Time: 16:48	Received by: (Signature)	Trip Blank Received: Yes / No ~~HCL~~ / MeoH TBR	
Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)	Temp: 0.9+1=1.0 °C	Bottles Received: 15
Relinquished by : (Signature)	Date:	Time:	Received for lab by: (Signature)	Date: 12/6/18	Time: 0895

If preservation required by Login: Date/Time

Hold:

Condition: NCF / (OK)