

7 July 2021

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

Subject: First Semiannual 2021 Groundwater Sampling Results  
BNSF Railway Company, Parkwater Rail Yard  
Spokane, Washington  
KJ 2196110\*00

Dear Ms. Treccani:

This letter summarizes the monitoring activities and presents the field and laboratory results for samples collected during the first semiannual 2021 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)<sup>1</sup>. 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. In a letter dated 16 April 2020, BNSF requested to discontinue analyzing DRO in groundwater. Ecology approved the proposed sampling reduction in a letter dated 21 April 2020.

According to the EDR, the caps from the soil remediation activities (East and West Debris Areas, Koch Asphalt Area, and the Diesel Shop Area) must be monitored on an annual basis for the first 5 years following completion of the soil cleanup action in 2015, then biennially thereafter. The fifth annual cap

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<sup>1</sup> GeoEngineers. 2013. Engineering Design Report, BNSF Parkwater Rail Yard Site, Spokane, Washington.

monitoring event was performed in June 2020. In accordance with the EDR, the next cap monitoring event will be performed in 2022.

## Field Activities

The first semiannual 2021 groundwater sampling event was conducted on 10 May 2021. Groundwater monitoring activities included measuring depth-to-water in monitoring wells, then purging groundwater from each well using a stainless steel bladder pump and collecting groundwater samples. Purging and sampling were conducted in general conformance with the U.S. Environmental Protection Agency's (EPA) low-flow groundwater sampling procedures<sup>2</sup>.

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 Services, LLC of Minneapolis, Minnesota (Pace), a Washington State-accredited environmental laboratory, under appropriate chain-of-custody. Samples were analyzed by Pace for total and dissolved arsenic by EPA Method 6020.

## Results

Depth-to-groundwater measurements and calculated groundwater elevations are summarized in Table 1 and presented on Figure 1. Water quality parameters measured during groundwater 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 the laboratory reports are included as Attachment B. The laboratory report was reviewed for quality control/quality assurance purposes and the data was found to be generally acceptable for its intended purpose.

Groundwater elevation measurements indicate a groundwater flow direction toward the west to northwest with an average hydraulic gradient of 0.002 feet per foot. This is consistent with the groundwater flow direction observed during previous monitoring events.

During the May 2021 sampling event, concentrations of total arsenic ranged from 0.00096 milligrams per liter (mg/L) in monitoring well MW-6 to 0.0041 mg/L in monitoring well MW-19. Reported concentrations of dissolved arsenic ranged from 0.00089 mg/L in monitoring well MW-6 to 0.0042 mg/L in monitoring well MW-19. Total and dissolved arsenic concentrations were reported below the site-specific cleanup level (CUL) of 0.005 mg/L.

## Summary and Conclusions

Total and dissolved arsenic concentrations reported in the four wells sampled in May 2021 were below the CUL of 0.005 mg/L. Arsenic concentrations were also below the Site specific CUL in the two semiannual 2019 events (total and dissolved arsenic in May 2019 and total arsenic in November 2019), and the second semiannual 2020 event (November 2020 samples).

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<sup>2</sup> 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.

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Washington State Department of Ecology  
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Please contact us at (503) 423-4018 if you have questions regarding the above information.

Very truly yours,

Kennedy/Jenks Consultants, Inc.



Alice Robinson  
Project Manager



7/7/2021

Ryan Hultgren, P.E.  
Principal Engineer

cc: Shane DeGross, BNSF Railway Company

Attachments:

- Table 1 – Groundwater Elevation Summary 10 May 2021
- Table 2 – Water Quality Parameters Summary
- Table 3 – 2016-2021 Groundwater Analytical Results Summary
- Figure 1 – Groundwater Potentiometric Map, 10 May 2021
- Figure 2 – Groundwater Results Map, 2016-2021
- Attachment A – Spokane Environmental Services Monitoring Well Sampling Field Log
- Attachment B – Laboratory Analytical Report and Chain-of-Custody Documentation

## Tables

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**TABLE 1**

**GROUNDWATER ELEVATION SUMMARY**

**10 May 2021**

**BNSF Parkwater Rail Yard**

**Spokane, Washington**

<b>Well Number</b>	<b>Date</b>	<b>Top of Casing Elevation (feet)<sup>(a)</sup></b>	<b>Depth to Groundwater (feet btoc)<sup>(b)</sup></b>	<b>Groundwater Elevation (feet amsl)<sup>(c)</sup></b>
MW-4	05/10/2021	1,950.76	60.39	1,890.37
MW-6	05/10/2021	1,951.04	61.43	1,889.61
MW-7	05/10/2021	1,951.13	61.63	1,889.50
MW-11	05/10/2021	1,951.20	63.95	1,887.25
MW-14	05/10/2021	1,951.41	62.32	1,889.09
MW-16	05/10/2021	1,950.44	61.90	1,888.54
MW-19	05/10/2021	1,951.24	61.72	1,889.52

Notes:

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

(b) btoc = below top of casing

(c) amsl = above mean sea level

**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	03/15/2016	7.37	0.278	0.72	11.17	1.34	76.4
	05/24/2016	7.41	0.254	1.63	12.59	1.03	83.9
	08/17/2016	7.40	0.255	5.78	14.37	6.56	14.8
	11/07/2016	6.79	0.412	1.21	12.66	0.60	-20.1
	03/08/2017	7.22	0.265	2.46	10.22	1.82	44.9
	11/06/2017	7.18	0.232	2.74	11.03	2.91	72.5
	06/28/2018	7.57	0.286	0.0	15.77	0.00	35.0
	12/05/2018	6.98	0.301	46.9	11.09	1.33	243.0
	05/14/2019	7.42	0.266	0.0	13.18	0.00	101.0
	01/08/2020	6.50	0.271	17.8	10.31	0.00	170.0
	06/16/2020	7.19	0.273	0.0	11.41	0.00	130.0
	11/19/2020	6.67	0.290	0.0	11.30	0.00	56.0
	05/10/2021	7.34	0.296	0.0	12.92	1.05	33.0
MW-7	03/15/2016	7.70	0.252	2.82	11.37	5.32	101.8
	05/24/2016	7.69	0.250	2.45	12.95	7.69	-72.9
	08/17/2016	7.87	0.244	3.42	15.11	7.77	38.8
	11/07/2016	7.53	0.255	0.23	11.93	6.45	83.6
	03/08/2017	7.32	0.290	2.77	10.29	4.46	51.5
	11/06/2017	7.88	0.251	7.79	11.33	5.89	73.9
	06/28/2018	7.82	0.275	0.0	14.91	1.78	131.0
	12/05/2018	7.63	0.290	5.2	10.87	4.25	258.0
	05/14/2019	7.28	0.260	0.0	12.78	4.54	138.0
	11/25/2019	8.00	0.340	25.5	7.41	7.70	36.0
	06/16/2020	7.78	0.264	0.0	12.30	5.19	135.0
	11/19/2020	7.60	0.249	0.0	10.83	4.26	132.0
	05/10/2021	7.31	0.297	0.0	14.00	3.94	-32.0
MW-14	03/15/2016	7.64	0.251	0.00	10.21	7.26	75.8
	05/24/2016	7.72	0.252	2.48	13.27	7.84	45.5
	08/17/2016	7.48	0.261	2.92	17.13	5.12	17.2
	11/07/2016	7.00	0.372	0.88	12.64	1.47	-24.3
	03/08/2017	7.14	0.265	11.71	9.35	7.11	65.3
	11/06/2017	7.52	0.289	13.59	8.96	3.58	33.3
	06/28/2018	8.02	0.261	0.0	17.12	5.15	173.0
	12/05/2018	7.21	0.339	7.8	10.58	1.98	155.0
	05/14/2019	7.64	0.253	0.0	12.93	5.64	55.0
	11/25/2019	7.63	0.451	31.4	7.20	11.90	0.0
	06/16/2020	7.91	0.252	0.0	12.44	6.69	128.0
	07/08/2020	7.97	0.245	0.0	15.80	7.21	100.0
	11/19/2020	7.10	0.338	0.0	10.87	0.40	-24.0
	05/10/2021	7.76	0.277	0.0	13.07	5.79	24.0

**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-19	03/15/2016	7.90	0.243	1.43	11.06	9.25	114.3
	05/24/2016	7.91	0.242	1.25	13.17	9.72	81.5
	08/17/2016	7.71	0.251	1.47	17.05	8.45	40.7
	11/07/2016	7.57	0.256	1.37	12.20	7.96	114.9
	03/08/2017	7.54	0.252	4.41	10.12	9.21	59.5
	11/06/2017	7.72	0.255	5.67	10.63	7.53	78.6
	06/28/2018	7.97	0.264	75.7	12.28	0.60	125.0
	12/05/2018	7.55	0.285	1.6	10.74	4.59	287.0
	05/14/2019	7.93	0.247	0.0	12.95	4.77	113.0
	11/25/2019	8.09	0.329	33.0	10.03	8.44	65.0
	06/16/2020	7.81	0.249	0.0	11.29	6.78	135.0
	11/19/2020	7.28	0.250	46.6	11.79	4.55	177.0
	05/10/2021	8.01	0.269	0.0	13.35	7.24	30.0

## Notes:

mS/cm = milliSiemens per centimeter.

NTU = nephelometric turbidity units.

°C = degrees Celsius.

mg/L = milligrams per liter.

ORP = oxidation-reduction potential.

mV = millivolts.

TABLE 3

**2016-2021 GROUNDWATER ANALYTICAL RESULTS SUMMARY**  
**BNSF Parkwater Rail Yard, Spokane, Washington**

Sample ID <sup>(a)</sup>	Monitoring Well ID <sup>(a)</sup>	Date	Total Arsenic <sup>(b)</sup> (mg/L)	Dissolved Arsenic <sup>(b)</sup> (mg/L)	Diesel-Range Organics <sup>(c)</sup> (mg/L)	Turbidity (NTU)
MW6-031516	MW-6	03/15/2016	0.002 U	0.002 U	0.488	0.72
MW6-052416		05/24/2016	0.002 U	--	0.201	1.63
MW6-081716		08/17/2016	<b>0.00505</b>	--	0.131 B	5.78
MW6-110716		11/07/2016	0.00450	--	<b>1.560</b>	1.21
MW6-030817		03/08/2017	0.00323	--	0.250 U	2.46
MW6-110617		11/06/2017	0.00139 J	--	0.095 J	2.74
PW-MW6-062818		06/28/2018	0.00334	--	0.200 U	0.0
		12/05/2018	<b>0.02090</b>	--	0.096 J	46.9
PW-MW6-051419		05/14/2019	0.00131 J	0.0014 J	0.200 U	0.0
		01/08/2020	0.00217	--	0.200 U	17.8
PW-MW6-061620		06/16/2020	0.00117 J	0.000979 J	--	0.0
MW-6-111920		11/19/2020	0.00391/0.00403	0.000942/0.000966 J/J	--	0.0
MW-6		05/10/2021	0.00096	0.00089	--	0.0
MW7-031516	MW-7	03/15/2016	0.00336	0.0032	0.153	2.82
MW7-052416		05/24/2016	0.00485	--	0.138	2.45
MW7-081716		08/17/2016	<b>0.00548</b>	--	0.100 U	3.42
MW7-110716		11/07/2016	0.00342	--	0.250 U	0.23
MW7-030817		03/08/2017	0.00200 U	--	0.250 U	2.77
MW7-110617		11/06/2017	0.00370	--	0.200 U	7.79
PW-MW7-062818		06/28/2018	0.00388	--	0.200 U	0.0
		12/05/2018	0.00495	--	0.200 U	5.2
PW-MW7-051419		05/14/2019	0.00305	0.00334	0.200 U	0.0
MW-7-112519		11/25/2019	0.00332	--	0.200 U	25.5
PW-MW7-061620		06/16/2020	0.00334	0.00325	--	0.0
MW-7-111920		11/19/2020	0.00389	0.00388	--	0.0
MW-7		05/10/2021	0.0030	0.0028	--	0.0
MW14-031516	MW-14	03/15/2016	0.00283/0.00289 <sup>(d)</sup>	0.00272/0.00279	0.100/0.100 U	0.0
MW14-052416		05/24/2016	0.00423/0.00397	--/--	0.100/0.100 U	2.48
MW14-081716		08/17/2016	0.00445/0.00371	--/--	0.100/0.112 U/B	2.42
MW14-110716		11/07/2016	0.00223/0.00225	--/--	<b>0.647/0.648</b>	0.88
MW14-030817		03/08/2017	<b>0.0104/0.0107</b>	--/--	0.250/0.250 U/U	11.71
MW14-110617		11/06/2017	0.00286/0.00295	--/--	0.200/0.200 U	13.59
PW-MW14-062818		06/28/2018	0.00482/0.00474	--/--	0.200/0.200 U	0.0
		12/05/2018	<b>0.00548/0.00331</b>	--/--	0.200/0.200 U	7.8
PW-MW14-051419		05/14/2019	0.00323/0.00358	0.00321/0.00313	0.200/0.200 U	0.0
MW-14-112519		11/25/2019	0.00381/0.00390	--/--	0.106/0.107 J/J	31.4
PW-MW14-061620		06/16/2020	<b>0.00820/0.00352</b> J	0.00384/0.00393	--	0.0
MW-14		07/08/2020	0.00473	0.0042	--	0.0
MW-14-111920		11/19/2020	0.00306	0.00297	--	0.0
MW-14		05/10/2021	0.0036/0.0036	0.0031/0.0029	--	0.0
MW19-031516	MW-19	03/15/2016	0.00394	0.00455	0.100 U	1.43
MW19-052416		05/24/2016	0.00416	--	0.100 U	1.25
MW19-081716		08/17/2016	0.00367	--	0.100 U	1.47
MW19-110716		11/07/2016	0.00334	--	0.250 U	1.37
MW19-030817		03/08/2017	0.00387	--	0.250 U	4.41
MW-19-110617		11/06/2017	0.00302	--	0.200 U	5.67
PW-MW19-062818		06/28/2018	<b>0.00564</b>	--	0.200 U	75.7
		12/05/2018	0.00389	--	0.200 U	1.6
PW-MW19-051419		05/14/2019	0.00432	0.00467	0.200 U	0.0
MW-19-112519		11/25/2019	0.00496	--	0.200 U	33.0
PW-MW19-061620		06/16/2020	0.00429	0.00434	--	0.0
MW-19-111920		11/19/2020	0.00416	0.00389	--	46.6
MW-19		05/10/2021	0.0041	0.0042	--	0.0
FB-031516	Field Blank	03/15/2016	0.002 U	0.002 U	0.100 U	--
FB-052416		05/24/2016	0.002 U	--	0.100 U	--
FB-081716		08/17/2016	0.002 U	--	0.100 U	--
FB-110716		11/07/2016	0.002 U	--	0.250 U	--
FB-030817		03/08/2017	0.00200 U	--	0.250 U	--

**2016-2021 GROUNDWATER ANALYTICAL RESULTS SUMMARY  
BNSF Parkwater Rail Yard, Spokane, Washington**

Sample ID <sup>(a)</sup>	Monitoring Well ID <sup>(a)</sup>	Date	Total Arsenic <sup>(b)</sup> (mg/L)	Dissolved Arsenic <sup>(b)</sup> (mg/L)	Diesel-Range Organics <sup>(c)</sup> (mg/L)	Turbidity (NTU)
RB-031516	Rinsate Blank	03/15/2016	0.002 U	0.002 U	0.100 U	--
RB-052416		05/24/2016	0.002 U	--	0.218	--
RB-081716		08/17/2016	0.002 U	--	0.100 U	--
RB-110716		11/07/2016	0.002 U	--	0.250 U	--
RB-030817		03/08/2017	0.002 U	--	0.250 U	--
PW-EB-051419		05/14/2019	0.002 U	--	0.200 U	--
PW-EB-061620		06/16/2020	0.002 U	--	--	--
EB-111920		11/19/2020	0.002 U	--	--	--
Rinsate		05/10/2021	0.00014 U	--	--	--
EDR Site-Specific Cleanup Levels	EDR Site-Specific Cleanup Levels		0.005	0.005	0.5	--

## Notes:

(a) Samples analyzed by Pace Analytical, Minneapolis, Minnesota

(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, 2018, and 2019 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 above 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.

## Figures

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Path: \\pckj-c-root\kjc-office\FWY\Bnsf\data\BNSF Washington\Parkwater\Events\2021 Events\2021 SA1 Event\Parkwater\GWContours.mxd

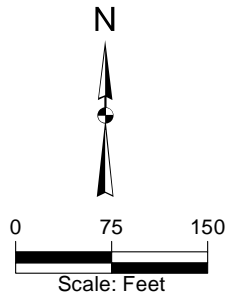


Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

**Legend**

- |  |   |
|--|---|
|  Monitoring Well, Groundwater Elevation, Sample Collected |  Interpreted Groundwater Gradient Direction                                    |
|  Monitoring Well, Groundwater Elevation Only              |  Interpreted Groundwater Elevation Contours (feet AMSL, dashed where inferred) |
|  Monitoring Well, Groundwater Not Measured                |  Fueling   |

**Note:**  
1. Locations are approximate.  
2. AMSL = Above Mean Sea Level



**Kennedy/Jenks Consultants**

BNSF Railway Company  
Parkwater Railyard  
Spokane, Washington

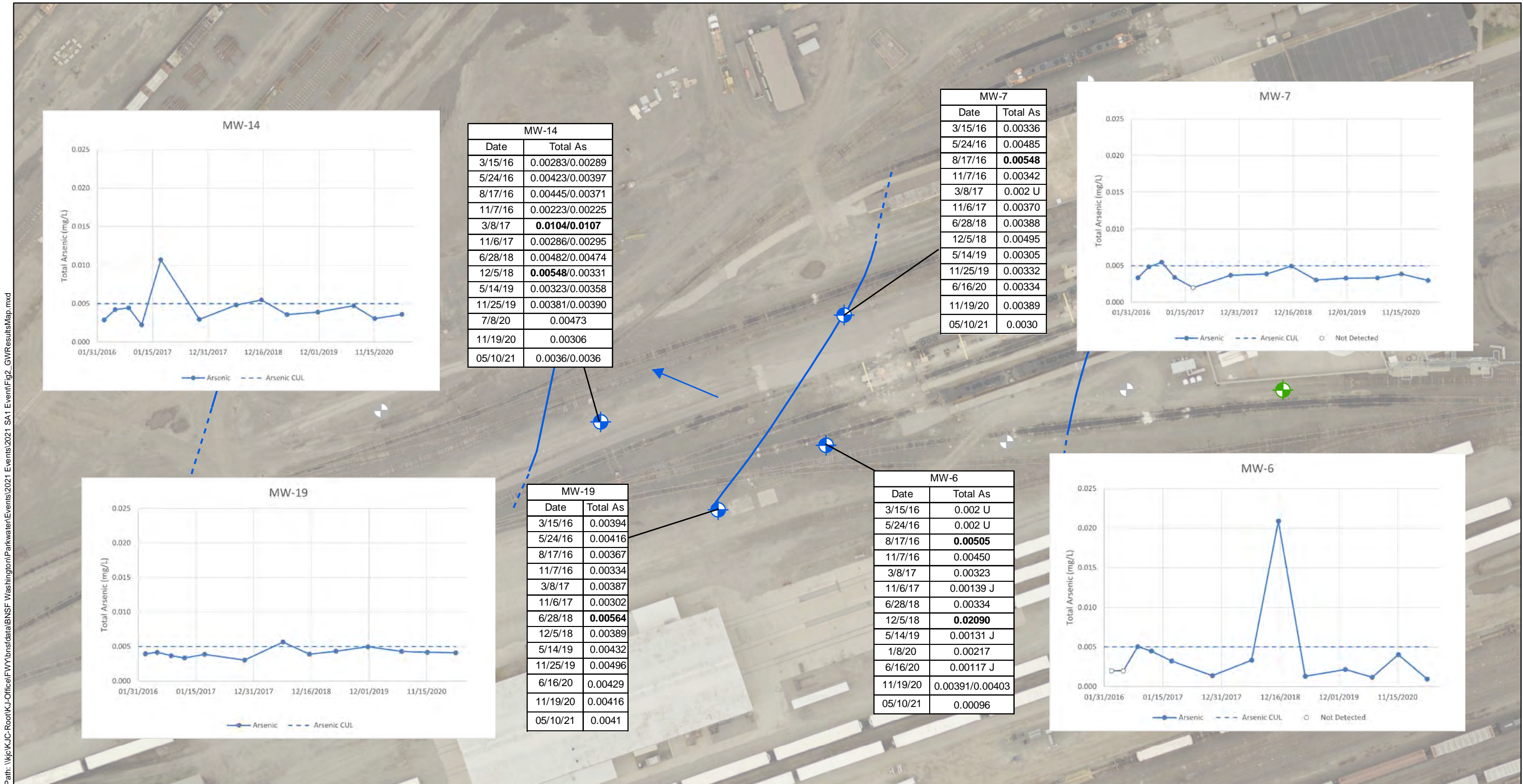
**Interpreted May 2021**  
**Groundwater Elevation Contour Map**

2196110\*00  
June 2021

**Figure 1**



Path: \\pckj-c-root\kjc-office\FWY\Bnsfdata\BNSF Washington\ParkwaterEvents\2021 Events\2021 SAT Event\Fig2\_GWRResultsMap.mxd



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

## Legend

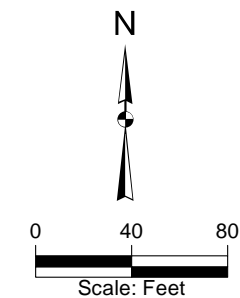
- Monitoring Well, Groundwater Elevation, Sample Collected
- Monitoring Well, Groundwater Elevation Only
- Monitoring Well, Groundwater Not Measured
- Interpreted Groundwater Gradient Direction
- Interpreted Groundwater Elevation Contours (feet AMSL, dashed where inferred)

## Linetype

- Dashed
- Solid

### Note:

- Locations are approximate.
- Groundwater results are in milligrams per liter (mg/L).
- Total As = Total Arsenic.  
CUL = Cleanup Level.  
U = Below the laboratory reporting limit.  
J = Concentration is estimated value above the laboratory detection limit and less than the laboratory reporting limit.
- Duplicate samples collected from MW-14.



## Kennedy/Jenks Consultants

BNSF Railway Company  
Parkwater Railyard  
Spokane, Washington

## Groundwater Results Map 2016-2021

2196110\*00  
June 2021

Figure 2

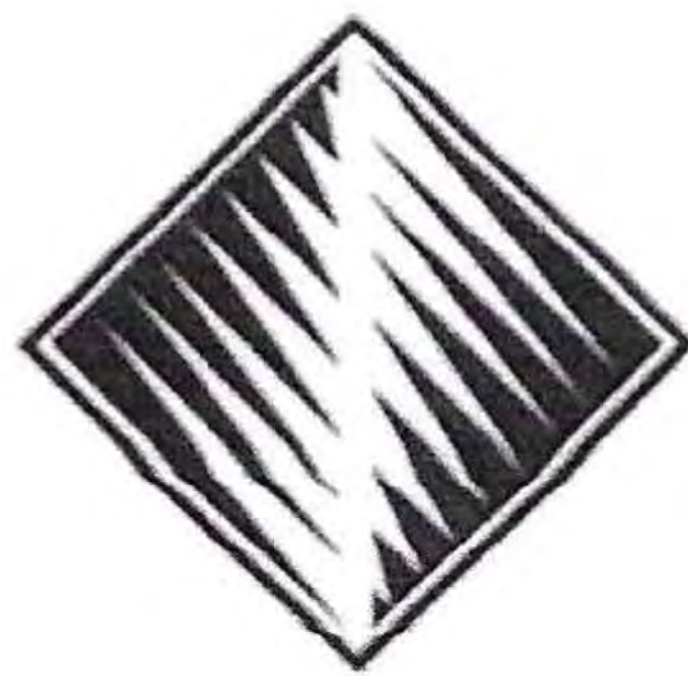


## Attachment A

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Spokane Environmental Services  
Monitoring Well Sampling Field Log





# FIELD ENVIRONMENTAL INSTRUMENTS, INC.

www.fieldenvironmental.com

301 Brushton Ave  
Suite A  
Pittsburgh, PA 15221  
Toll Free (800) 393-4009  
Local (412) 436-2600  
Fax (412) 436-2616

	Lot #	Expiration
Horiba Auto-Cal Solution	70005360	6/2/2022

Cal Standard	Reading	Acceptable Range
PH 4 @ 25°	4.00	(3.96 - 4.04)

Cal Standard	Reading ms/cm	Acceptable Range
Conductivity	4.45	(4.31 - 4.58)

Cal Standard	Reading NTU	Acceptable Range
Turbidity	0.0	(-2 - +2)

100 NTU ▼	100.0	(95 - 105) ▼
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Dissolved Oxygen	Reading mg/L
100% Saturation	10.12
0% Saturation	0.00

Cal Standard	Lot #	Expiration	Reading	Acceptable Range
PH 7 @ 25°	8012081.00	12/17/2022	7.00	(6.93 - 7.07)

Cal Standard	Lot #	Expiration	Reading	Acceptable Range
PH 10 @ 25°	7911113.00	11/1/2021	10.00	(9.9 - 10.1)

Check Standard	Temp °	Relative Reading	Acceptable Range
ORP	21.0	220.0	(+/- 15mV)

☒ ORP pin in place

\*Solutions provided by LabChem (412-826-5230)

Model	U-52-2 ▼
S/N	7A184T9A
Sonde	U91202X
Barcode	U89385X
Order #	455528

Calibrated By Don Redeen ▼

Date of Calibration 5/6/2021

All calibrations performed by FEI conform to manufacturer's specifications. Please report any issues within 24 hours of receiving equipment.

All calibration solutions used are traceable to NIST. Additional documentation is available upon request.



# CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

## Section A

Required Client Information:

Company: Kennedy Jenks\_BNSF  
Address: 275 Battery Street, Suite 550  
San Francisco, CA 94111  
Email To: Alice Robinson  
Phone: 503-423-4018 Fax:  
Requested Due Date/TAT: Standard

## Section B

Required Project Information:

Report To: Alice Robinson  
Copy To: Ryan Hultgren, Janice Sloan  
Todd Miller  
Purchase Order No.:  
Project Name:  
Project Number: BNSF Parkwater

## Section C

Invoice Information:

Attention: Alice Robinson  
Company Name: Kennedy Jenks  
Address: ap@kennedyjenks.com  
Pace Quote Reference:  
Pace Project Manager: Jennifer Anderson  
Pace Profile #: 42766, Line 1

Page: 1 of 1

## REGULATORY AGENCY

☐ NPDES ☐ GROUND WATER ☐ DRINKING WATER  
☐ UST ☐ RCRA ☐ OTHER

Site Location

WA

STATE:

## Requested Analysis Filtered (Y/N)

ITEM #	Section D Required Client Information	Valid Matrix Codes MATRIX CODE DRINKING WATER DW WATER WT WASTE WATER WW PRODUCT P SOIL/SOLID SL OIL OL WIPE WP AIR AR OTHER OT TISSUE TS	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED				SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives										Analysis Test Y/N	6020 Total Arsenic Y	6020 Dissolved Arsenic Y																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																			</
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ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS
**BNSF Tech Specs**							
Ref: 1003-JMA 807577 Date: 28Apr21 Dep: 1003- Wgt: 45.00 LBS DV: 0.00	SHIPPING: 0.00 SPECIAL: 0.00 HANDLING: 0.00 TOTAL: 0.00						
Spec: PRIORITY OVERNIGHT Master 1456 2247 1702 TRCK: 1456 2247 1702							

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER:

SIGNATURE of SAMPLER:

DATE Signed (MM/DD/YY):

Temp in °C

Received on Ice (Y/N)

Custody Sealed Cooler (Y/N)

Samples Intact (Y/N)





**Spokane  
Environmental  
Solutions**

<https://www.spokaneenvironmental.com>

Job: BNSF Parkwater

Date: 5.10.21

Calculated By: Brandon Kantzway

Sheet: \_\_\_\_\_ of \_\_\_\_\_

Scale: \_\_\_\_\_

8:00 AM - Arrived at site & waited for  
flagger to arrive for about  
an hour.

9:00 AM - Began locating wells for sampling.

9:30 AM - 2:30 PM - Sampled wells MW-6, MW-7  
MW-14 & MW-19.

3:45 PM - Samples delivered to FedEx.



# Monitoring Well Sampling Field Log - Low Flow

Well Number: **MW-6**

Date: **5.10.21**

SUBCONTRACTOR: Spokane Environmental Solutions, LLC

Project Information	
Project Name:	BNSF - Parkwater
KJ Project Number:	2196110*00
Sampling Information	
Field Team:	GP PAK
Purge Method:	low flow
Sampling Method:	bladder
Water Quality Meter:	Model: Horiba U5000
	Serial Number: 7A8477A
Purge Water Disposition:	
Comments	

Well Construction Information			
Stick-up or Flush	Well Diameter (in)	Total Depth (ft btoc)	Screen Interval (ft bgs or btoc)
Flush	2-inch		
Monitoring Information			
Initial DTW (ft btoc)	Saturated Screen Interval (ft bgs or btoc)	Pump Intake Depth (ft btoc): (Mid Sat. Screen Interval)	
61.43			
Sample Containers			
Number	Type	Preservative	Analytical Parameters
1	total	HNO3	As
1	dis	HNO3	As

Well Purge Data										
Time	Volume Purged (L)	Purge Rate (L/min) (<0.5 L/min)	DTW (ft btoc)	Temp. (°C)	pH	ORP (mV)	Conductivity (mS/cm)	Turbidity	D.O. (mg/L)	Clarity/Color/Remarks
	Pump On		Initial	±0.3%	±0.1	±10mv	±0.3%	± 10%	± 10%	<= Stabilization Criteria (EPA, 2017)
11:45		2000	61.43	17.05	7.91	41	0.299	0.0	4.14	clear
11:50				13.67	7.70	27	0.297	0.0	0.55	
11:55				13.31	7.57	27	0.296	0.0	0.71	
12:00				13.12	7.48	29	0.296	0.0	1.05	
12:05				13.06	7.39	31	0.296	0.0	1.17	
12:10				12.92	7.34	33	0.296	0.0	1.05	
Start Sampling				Sample ID: MW-6				Sample Time: 12:10		
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 CI=cloudy SC=slightly cloudy AC=almost clear C=clear CC=crystal clear

Stabilization Criteria (EPA, 2017): Turbidity (10% for values greater than 5 NTU; if three Turbidity values are less than 5 NTU, consider the values as stabilized), Dissolved Oxygen (10% for values greater than 0.5 mg/L, if three Dissolved Oxygen values are less than 0.5 mg/L, consider the values as stabilized).



# Monitoring Well Sampling Field Log - Low Flow

Well Number:

MW-7

Date:

5.10.21

SUBCONTRACTOR: Spokane Environmental Solutions, LLC

Project Information	
Project Name:	BNSF - Parkwater
KJ Project Number:	2196110*00
Sampling Information	
Field Team:	GP BAE
Purge Method:	low flow
Sampling Method:	fluider
Water Quality Meter:	Model: Horiba U5000 Serial Number: 748479 A
Purge Water Disposition:	
Comments	

Well Construction Information			
Stick-up or Flush	Well Diameter (in)	Total Depth (ft btoc)	Screen Interval (ft bgs or btoc)
Flush	2-inch		
Monitoring Information			
Initial DTW (ft btoc)	Saturated Screen Interval (ft bgs or btoc)	Pump Intake Depth (ft btoc): (Mid Sat. Screen Interval)	
61.63			
Sample Containers			
Number	Type	Preservative	Analytical Parameters
1	total	HNO3	As
1	diss.	HNO3	As

Well Purge Data										
Time	Volume Purged (L)	Purge Rate (L/min) (<0.5 L/min)	DTW (ft btoc)	Temp. (°C)	pH	ORP (mV)	Conductivity (mS/cm)	Turbidity	D.O. (mg/L)	Clarity/Color/Remarks
	Pump On		Initial	±0.3%	±0.1	±10mv	±0.3%	± 10%	± 10%	<= Stabilization Criteria (EPA, 2017)
12:45		200 ml	61.63	15.66	7.22	53	0.292	0.0	5.39	clear
12:50				14.87	7.26	24	0.296	0.0	4.52	
12:55				14.66	7.29	3	0.297	0.0	4.07	
13:00				14.13	7.32	-14	0.298	0.0	4.11	
13:05				13.93	7.34	-20	0.297	0.0	4.06	
13:10				13.97	7.32	-29	0.297	0.0	4.01	
13:15				14:00	7.31	-32	0.297	0.0	3.94	
Start Sampling			Sample ID: MW-7				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 CI=cloudy SC=slightly cloudy AC=almost clear C=clear CC=crystal clear

Stabilization Criteria (EPA, 2017): Turbidity (10% for values greater than 5 NTU; if three Turbidity values are less than 5 NTU, consider the values as stabilized), Dissolved Oxygen (10% for values greater than 0.5 mg/L, if three Dissolved Oxygen values are less than 0.5 mg/L, consider the values as stabilized).



# Monitoring Well Sampling Field Log - Low Flow

Well Number:

MW-14

Date:

5.10.21

SUBCONTRACTOR: Spokane Environmental Solutions, LLC

Project Information	
Project Name:	BNSF - Parkwater
KJ Project Number:	2196110*00
Sampling Information	
Field Team:	GP BAX
Purge Method:	low flow
Sampling Method:	bladder
Water Quality Meter:	Model: Horiba U5000
	Serial Number: 2A84T9A
Purge Water Disposition:	
Comments	

Well Construction Information				
Stick-up or Flush	Well Diameter (in)	Total Depth (ft btoc)	Screen Interval (ft bgs or btoc)	
Flush	2-inch			
Monitoring Information				
Initial DTW (ft btoc)	Saturated Screen Interval (ft bgs or btoc)	Pump Intake Depth (ft btoc): (Mid Sat. Screen Interval)		
62.32				
Sample Containers				
Number	Type	Preservative	Analytical Parameters	Filtered?
2	total	HNO3	As	
2	dist.	HNO3	As	

Well Purge Data										
Time	Volume Purged (L)	Purge Rate (L/min) (<0.5 L/min)	DTW (ft btoc)	Temp. (°C)	pH	ORP (mV)	Conductivity (mS/cm)	Turbidity	D.O. (mg/L)	Clarity/Color/Remarks
	Pump On		Initial	±0.3%	±0.1	±10mv	±0.3%	± 10%	± 10%	<= Stabilization Criteria (EPA, 2017)
13:50		200 ml	62.32	16.04	7.38	34	0.280	0.0	5.84	Clear
13:55				13.64	7.73	17	0.278	0.0	5.86	
14:00				13.46	7.74	20	0.276	0.0	5.92	
14:05				13.08	7.76	23	0.277	0.0	5.87	
14:10				13.07	7.76	24	0.277	0.0	5.79	
Start Sampling			Sample ID: MW-14				Sample Time: 14:10			
End Sampling			QA/QC Sample ID: DUP 51021				QA/QC Sample Time: 14:10			

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

Stabilization Criteria (EPA, 2017): Turbidity (10% for values greater than 5 NTU; if three Turbidity values are less than 5 NTU, consider the values as stabilized), Dissolved Oxygen (10% for values greater than 0.5 mg/L; if three Dissolved Oxygen values are less than 0.5 mg/L, consider the values as stabilized).



## Monitoring Well Sampling Field Log - Low Flow

Well Number:

Date:

**SUBCONTRACTOR: Spokane Environmental Solutions, LLC**

[illegible]

Well Purge Data										
Time	Volume Purged (L)	Purge Rate (L/min) ( <small>&lt;0.5 L/min</small> )	DTW (ft btoc)	Temp. (°C)	pH	ORP (mV)	Conductivity (mS/cm)	Turbidity	D.O. (mg/L)	Clarity/Color/Remarks
	Pump On		Initial	±0.3%	±0.1	±10mv	±0.3%	± 10%	± 10%	<= Stabilization Criteria (EPA, 201)
10:15	0	200ml	61.72	15.85	9.23	11	0.339	0.0	8.98	clear
10:20	1			13.91	8.40	12	0.293	0.0	7.41	
10:25	2			13.65	8.23	11	0.284	0.0	7.43	
10:30	3			13.59	8.12	14	0.275	0.0	7.35	
10:35	4			13.32	8.06	14	0.271	0.0	7.49	
10:40	5			13.36	8.03	19	0.270	0.0	7.43	
10:45	6			13.35	8.01	30	0.269	0.0	7.24	
	Start Sampling			Sample ID: MW-19			Sample Time: 10:45			
	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

Stabilization Criteria (EPA, 2017): Turbidity (10% for values greater than 5 NTU; if three Turbidity values are less than 5 NTU, consider the values as stabilized), Dissolved Oxygen (10% for values greater than 0.5 mg/L; if three Dissolved Oxygen values are less than 0.5 mg/L, consider the values as stabilized).



Path: N:\BNSF Washington\Parkwater\Events\ParkwaterGWContours\_Nov2017.mxd ©2017 Kennedy/Jenks Consultants



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

1882.03 Groundwater Elevation



Groundwater Contour (Dashed Where Inferred)



Approximate Direction of Hydraulic Flow



Site Boundary

### Note:

1. All locations are
2. Groundwater elevation is mean sea level
3. Groundwater elevation is



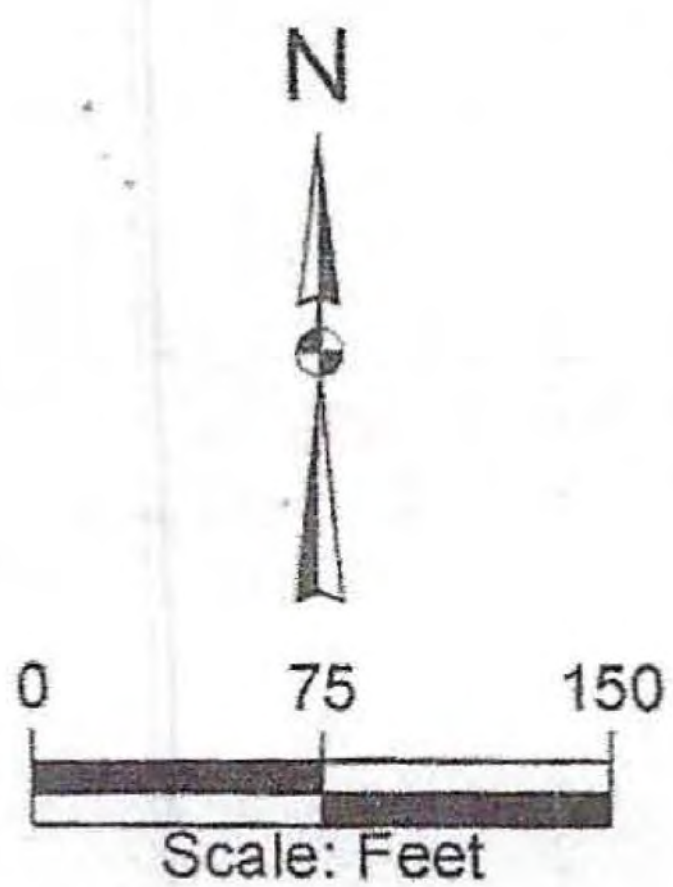


proximate.  
ion measured in feet above  
ions are relative to the NAVD 88 Datum.

Sample

DTW: ✓

MW-14-DUP



## Kennedy/Jenks Consultants

BNSF Railway Company  
Parkwater Railyard  
Spokane, Washington

### Groundwater Potentiometric Map 6 November 2017

1796110\*00  
November 2017

Figure 1



## Attachment B

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Laboratory Analytical Report and  
Chain-of-Custody Documentation

June 29, 2021

Alice Robinson  
Kennedy/Jenks Consultants  
275 Battery Street  
Suite 550  
San Francisco, CA 94111

RE: Project: BNSF Parkwater-Revised Report  
Pace Project No.: 10559554

Dear Alice Robinson:

Enclosed are the analytical results for sample(s) received by the laboratory on May 11, 2021. The results relate only to the samples included in this report. Results reported herein conform to the applicable TNI/NELAC Standards and the laboratory's Quality Manual, where applicable, unless otherwise noted in the body of the report.

The test results provided in this final report were generated by each of the following laboratories within the Pace Network:

- Pace Analytical Services - Minneapolis

This report was revised on June 28, 2021, to evaluate results to the reporting limit.

This report was revised on June 29, 2021, to evaluate results as non-detect to the method detection limit.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,



Jennifer Anderson  
jennifer.anderson@pacelabs.com  
(612)607-6436  
Project Manager

Enclosures

cc: Ryan Hultgren, Kennedy Jenks  
Kennedy Jenks Lab Data, Kennedy Jenks  
Todd Miller, Kennedy/Jenks Consultants  
Janice Sloan, Kennedy/Jenks



## REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,  
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## CERTIFICATIONS

Project: BNSF Parkwater-Revised Report

Pace Project No.: 10559554

### Pace Analytical Services, LLC - Minneapolis MN

1700 Elm Street SE, Minneapolis, MN 55414

1800 Elm Street SE, Minneapolis, MN 55414--Satellite Air Lab

A2LA Certification #: 2926.01\*

Alabama Certification #: 40770

Alaska Contaminated Sites Certification #: 17-009\*

Alaska DW Certification #: MN00064

Arizona Certification #: AZ0014\*

Arkansas DW Certification #: MN00064

Arkansas WW Certification #: 88-0680

California Certification #: 2929

Colorado Certification #: MN00064

Connecticut Certification #: PH-0256

EPA Region 8 Tribal Water Systems+Wyoming DW Certification #: via MN 027-053-137

Florida Certification #: E87605\*

Georgia Certification #: 959

Hawaii Certification #: MN00064

Idaho Certification #: MN00064

Illinois Certification #: 200011

Indiana Certification #: C-MN-01

Iowa Certification #: 368

Kansas Certification #: E-10167

Kentucky DW Certification #: 90062

Kentucky WW Certification #: 90062

Louisiana DEQ Certification #: AI-03086\*

Louisiana DW Certification #: MN00064

Maine Certification #: MN00064\*

Maryland Certification #: 322

Michigan Certification #: 9909

Minnesota Certification #: 027-053-137\*

Minnesota Dept of Ag Approval: via MN 027-053-137

Minnesota Petrofund Registration #: 1240\*

Mississippi Certification #: MN00064

Missouri Certification #: 10100

Montana Certification #: CERT0092

Nebraska Certification #: NE-OS-18-06

Nevada Certification #: MN00064

New Hampshire Certification #: 2081\*

New Jersey Certification #: MN002

New York Certification #: 11647\*

North Carolina DW Certification #: 27700

North Carolina WW Certification #: 530

North Dakota Certification #: R-036

Ohio DW Certification #: 41244

Ohio VAP Certification (1700) #: CL101

Ohio VAP Certification (1800) #: CL110\*

Oklahoma Certification #: 9507\*

Oregon Primary Certification #: MN300001

Oregon Secondary Certification #: MN200001\*

Pennsylvania Certification #: 68-00563\*

Puerto Rico Certification #: MN00064

South Carolina Certification #: 74003001

Tennessee Certification #: TN02818

Texas Certification #: T104704192\*

Utah Certification #: MN00064\*

Vermont Certification #: VT-027053137

Virginia Certification #: 460163\*

Washington Certification #: C486\*

West Virginia DEP Certification #: 382

West Virginia DW Certification #: 9952 C

Wisconsin Certification #: 999407970

Wyoming UST Certification #: via A2LA 2926.01

USDA Permit #: P330-19-00208

\*Please Note: Applicable air certifications are denoted with an asterisk (\*).

## REPORT OF LABORATORY ANALYSIS

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## SAMPLE SUMMARY

Project: BNSF Parkwater-Revised Report

Pace Project No.: 10559554

Lab ID	Sample ID	Matrix	Date Collected	Date Received
10559554001	Rinsate	Water	05/10/21 00:00	05/11/21 10:20
10559554002	MW-19	Water	05/10/21 10:45	05/11/21 10:20
10559554003	MW-6	Water	05/10/21 12:10	05/11/21 10:20
10559554004	MW-7	Water	05/10/21 13:15	05/11/21 10:20
10559554005	MW-14	Water	05/10/21 14:10	05/11/21 10:20
10559554006	DUP 051021	Water	05/10/21 00:00	05/11/21 10:20

## REPORT OF LABORATORY ANALYSIS

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## SAMPLE ANALYTE COUNT

Project: BNSF Parkwater-Revised Report

Pace Project No.: 10559554

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
10559554001	Rinsate	EPA 6020B	PW1	1	PASI-M
10559554002	MW-19	EPA 6020B	PW1	1	PASI-M
		EPA 6020B	BWB	1	PASI-M
10559554003	MW-6	EPA 6020B	PW1	1	PASI-M
		EPA 6020B	BWB	1	PASI-M
10559554004	MW-7	EPA 6020B	PW1	1	PASI-M
		EPA 6020B	BWB	1	PASI-M
10559554005	MW-14	EPA 6020B	PW1	1	PASI-M
		EPA 6020B	BWB	1	PASI-M
10559554006	DUP 051021	EPA 6020B	PW1	1	PASI-M
		EPA 6020B	BWB	1	PASI-M

PASI-M = Pace Analytical Services - Minneapolis

## REPORT OF LABORATORY ANALYSIS

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## PROJECT NARRATIVE

Project: BNSF Parkwater-Revised Report

Pace Project No.: 10559554

---

**Method:** EPA 6020B

**Description:** 6020B MET ICPMS

**Client:** KENNEDY JENKS\_BNSF

**Date:** June 29, 2021

### General Information:

6 samples were analyzed for EPA 6020B by Pace Analytical Services Minneapolis. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

### Hold Time:

The samples were analyzed within the method required hold times with any exceptions noted below.

### Sample Preparation:

The samples were prepared in accordance with EPA 3020A with any exceptions noted below.

### Initial Calibrations (including MS Tune as applicable):

All criteria were within method requirements with any exceptions noted below.

### Continuing Calibration:

All criteria were within method requirements with any exceptions noted below.

### Internal Standards:

All internal standards were within QC limits with any exceptions noted below.

### Method Blank:

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

### Laboratory Control Spike:

All laboratory control spike compounds were within QC limits with any exceptions noted below.

### Matrix Spikes:

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

### Additional Comments:

## REPORT OF LABORATORY ANALYSIS

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## PROJECT NARRATIVE

Project: BNSF Parkwater-Revised Report

Pace Project No.: 10559554

---

**Method:** EPA 6020B

**Description:** 6020B MET ICPMS, Dissolved

**Client:** KENNEDY JENKS\_BNSF

**Date:** June 29, 2021

### General Information:

5 samples were analyzed for EPA 6020B by Pace Analytical Services Minneapolis. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

### Hold Time:

The samples were analyzed within the method required hold times with any exceptions noted below.

### Sample Preparation:

The samples were prepared in accordance with EPA 3020A with any exceptions noted below.

### Initial Calibrations (including MS Tune as applicable):

All criteria were within method requirements with any exceptions noted below.

### Continuing Calibration:

All criteria were within method requirements with any exceptions noted below.

### Internal Standards:

All internal standards were within QC limits with any exceptions noted below.

### Method Blank:

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

### Laboratory Control Spike:

All laboratory control spike compounds were within QC limits with any exceptions noted below.

### Matrix Spikes:

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

### Additional Comments:

This data package has been reviewed for quality and completeness and is approved for release.

## REPORT OF LABORATORY ANALYSIS

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## ANALYTICAL RESULTS

Project: BNSF Parkwater-Revised Report

Pace Project No.: 10559554

<b>Sample: Rinsate</b>		<b>Lab ID: 10559554001</b>		Collected: 05/10/21 00:00		Received: 05/11/21 10:20		Matrix: Water	
Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>6020B MET ICPMS</b>									
Analytical Method: EPA 6020B Preparation Method: EPA 3020A Pace Analytical Services - Minneapolis									
Arsenic	ND	ug/L	0.50	0.14	1	05/17/21 06:15	05/18/21 19:29	7440-38-2	

## REPORT OF LABORATORY ANALYSIS

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## ANALYTICAL RESULTS

Project: BNSF Parkwater-Revised Report

Pace Project No.: 10559554

Sample: MW-19		Lab ID: 10559554002		Collected: 05/10/21 10:45		Received: 05/11/21 10:20		Matrix: Water	
Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>6020B MET ICPMS</b>									
Analytical Method: EPA 6020B Preparation Method: EPA 3020A									
Pace Analytical Services - Minneapolis									
Arsenic	4.1	ug/L	0.50	0.14	1	05/17/21 06:15	05/18/21 19:33	7440-38-2	
<b>6020B MET ICPMS, Dissolved</b>									
Analytical Method: EPA 6020B Preparation Method: EPA 3020A									
Pace Analytical Services - Minneapolis									
Arsenic, Dissolved	4.2	ug/L	0.50	0.14	1	05/19/21 06:39	05/25/21 01:53	7440-38-2	

## REPORT OF LABORATORY ANALYSIS

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## ANALYTICAL RESULTS

Project: BNSF Parkwater-Revised Report

Pace Project No.: 10559554

Sample: MW-6		Lab ID: 10559554003		Collected: 05/10/21 12:10		Received: 05/11/21 10:20		Matrix: Water	
Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>6020B MET ICPMS</b>									
Analytical Method: EPA 6020B Preparation Method: EPA 3020A									
Pace Analytical Services - Minneapolis									
Arsenic	<b>0.96</b>	ug/L	0.50	0.14	1	05/17/21 06:15	05/18/21 19:36	7440-38-2	
<b>6020B MET ICPMS, Dissolved</b>									
Analytical Method: EPA 6020B Preparation Method: EPA 3020A									
Pace Analytical Services - Minneapolis									
Arsenic, Dissolved	<b>0.89</b>	ug/L	0.50	0.14	1	05/19/21 06:39	05/25/21 02:10	7440-38-2	

## REPORT OF LABORATORY ANALYSIS

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## ANALYTICAL RESULTS

Project: BNSF Parkwater-Revised Report

Pace Project No.: 10559554

Sample: MW-7		Lab ID: 10559554004		Collected: 05/10/21 13:15		Received: 05/11/21 10:20		Matrix: Water	
Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>6020B MET ICPMS</b>									
Analytical Method: EPA 6020B Preparation Method: EPA 3020A									
Pace Analytical Services - Minneapolis									
Arsenic	3.0	ug/L	0.50	0.14	1	05/17/21 06:15	05/18/21 19:39	7440-38-2	
<b>6020B MET ICPMS, Dissolved</b>									
Analytical Method: EPA 6020B Preparation Method: EPA 3020A									
Pace Analytical Services - Minneapolis									
Arsenic, Dissolved	2.8	ug/L	0.50	0.14	1	05/19/21 06:39	05/25/21 02:14	7440-38-2	

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## ANALYTICAL RESULTS

Project: BNSF Parkwater-Revised Report

Pace Project No.: 10559554

Sample: MW-14		Lab ID: 10559554005		Collected: 05/10/21 14:10		Received: 05/11/21 10:20		Matrix: Water	
Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>6020B MET ICPMS</b>									
Analytical Method: EPA 6020B Preparation Method: EPA 3020A									
Pace Analytical Services - Minneapolis									
Arsenic	3.6	ug/L	0.50	0.14	1	05/17/21 06:15	05/18/21 19:42	7440-38-2	
<b>6020B MET ICPMS, Dissolved</b>									
Analytical Method: EPA 6020B Preparation Method: EPA 3020A									
Pace Analytical Services - Minneapolis									
Arsenic, Dissolved	3.1	ug/L	0.50	0.14	1	05/19/21 06:39	05/25/21 02:27	7440-38-2	

## REPORT OF LABORATORY ANALYSIS

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## ANALYTICAL RESULTS

Project: BNSF Parkwater-Revised Report

Pace Project No.: 10559554

<b>Sample: DUP 051021</b>		<b>Lab ID: 10559554006</b>		Collected: 05/10/21 00:00		Received: 05/11/21 10:20		Matrix: Water	
Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>6020B MET ICPMS</b>									
Analytical Method: EPA 6020B Preparation Method: EPA 3020A									
Pace Analytical Services - Minneapolis									
Arsenic	<b>3.6</b>	ug/L	0.50	0.14	1	05/17/21 06:15	05/18/21 19:45	7440-38-2	
<b>6020B MET ICPMS, Dissolved</b>									
Analytical Method: EPA 6020B Preparation Method: EPA 3020A									
Pace Analytical Services - Minneapolis									
Arsenic, Dissolved	<b>2.9</b>	ug/L	0.50	0.14	1	05/19/21 06:39	05/25/21 02:31	7440-38-2	

## REPORT OF LABORATORY ANALYSIS

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## QUALITY CONTROL DATA

Project: BNSF Parkwater-Revised Report

Pace Project No.: 10559554

QC Batch: 742293

Analysis Method: EPA 6020B

QC Batch Method: EPA 3020A

Analysis Description: 6020B Water UPD5

Laboratory: Pace Analytical Services - Minneapolis

Associated Lab Samples: 10559554001, 10559554002, 10559554003, 10559554004, 10559554005, 10559554006

METHOD BLANK: 3959214

Matrix: Water

Associated Lab Samples: 10559554001, 10559554002, 10559554003, 10559554004, 10559554005, 10559554006

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Arsenic	ug/L	ND	0.50	0.14	05/18/21 19:00	

LABORATORY CONTROL SAMPLE: 3959215

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Arsenic	ug/L	100	98.5	98	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 3959216 3959217

Parameter	Units	10558626001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Arsenic	ug/L	206	100	100	295	286	88	80	75-125	3	20	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

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## QUALITY CONTROL DATA

Project: BNSF Parkwater-Revised Report

Pace Project No.: 10559554

QC Batch:	742335	Analysis Method:	EPA 6020B
QC Batch Method:	EPA 3020A	Analysis Description:	6020B Water Dissolved UPD5
		Laboratory:	Pace Analytical Services - Minneapolis

Associated Lab Samples: 10559554002, 10559554003, 10559554004, 10559554005, 10559554006

METHOD BLANK: 3959393 Matrix: Water

Associated Lab Samples: 10559554002, 10559554003, 10559554004, 10559554005, 10559554006

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Arsenic, Dissolved	ug/L	ND	0.50	0.14	05/25/21 01:47	

LABORATORY CONTROL SAMPLE: 3959394

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Arsenic, Dissolved	ug/L	100	98.6	99	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 3959395 3959396

Parameter	Units	10559554002 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Arsenic, Dissolved	ug/L	4.2	100	100	102	102	98	98	75-125	0	20	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

## REPORT OF LABORATORY ANALYSIS

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## QUALIFIERS

Project: BNSF Parkwater-Revised Report

Pace Project No.: 10559554

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### DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

TNTC - Too Numerous To Count

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit - The lowest concentration value that meets project requirements for quantitative data with known precision and bias for a specific analyte in a specific matrix.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

## REPORT OF LABORATORY ANALYSIS

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## QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: BNSF Parkwater-Revised Report

Pace Project No.: 10559554

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
10559554001	Rinsate	EPA 3020A	742293	EPA 6020B	742671
10559554002	MW-19	EPA 3020A	742293	EPA 6020B	742671
10559554003	MW-6	EPA 3020A	742293	EPA 6020B	742671
10559554004	MW-7	EPA 3020A	742293	EPA 6020B	742671
10559554005	MW-14	EPA 3020A	742293	EPA 6020B	742671
10559554006	DUP 051021	EPA 3020A	742293	EPA 6020B	742671
10559554002	MW-19	EPA 3020A	742335	EPA 6020B	743301
10559554003	MW-6	EPA 3020A	742335	EPA 6020B	743301
10559554004	MW-7	EPA 3020A	742335	EPA 6020B	743301
10559554005	MW-14	EPA 3020A	742335	EPA 6020B	743301
10559554006	DUP 051021	EPA 3020A	742335	EPA 6020B	743301

## REPORT OF LABORATORY ANALYSIS

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# CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

## Section A

Required Client Information:

Company: Kennedy Jenks\_BNSF  
Address: 275 Battery Street, Suite 550  
San Francisco, CA 94111  
Email To: Alice Robinson  
Phone: 503-423-4018 Fax:  
Requested Due Date/TAT: Standard

## Section B

Required Project Information:

Report To: Alice Robinson  
Copy To: Ryan Hultgren, Janice Sloan  
Todd Miller  
Purchase Order No.:  
Project Name:  
Project Number: BNSF Parkwater

## Section C

Invoice Information:

Attention: Alice Robinson  
Company Name: Kennedy Jenks  
Address: ap@kennedyjenks.com  
Pace Quote Reference:  
Pace Project Manager: Jennifer Anderson  
Pace Profile #: 42766, Line 1

Page: 1 of 1

## REGULATORY AGENCY

☐ NPDES ☐ GROUND WATER ☐ DRINKING WATER  
☐ UST ☐ RCRA ☐ OTHER

Site Location

WA

STATE:

## Requested Analysis Filtered (Y/N)

ITEM #	Section D Required Client Information	Valid Matrix Codes MATRIX CODE DRINKING WATER DW WATER WT WASTE WATER WW PRODUCT P SOIL/SOLID SL OIL OL WIPE WP AIR AR OTHER OT TISSUE TS	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED				SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives								Analysis Test	Y/N	Y	Requested Analysis Filtered (Y/N)										Residual Chlorine (Y/N)	Pace Project No./ Lab I.D.
					DATE	TIME	DATE	TIME			Unpreserved	H <sub>2</sub> SO <sub>4</sub>	HNO <sub>3</sub>	HCl	NaOH	Na <sub>2</sub> S <sub>2</sub> O <sub>3</sub>	Methanol	Other															
1	Rinsate		W	G	5/10/21	-				1												X											
2	mw-19		W	G	5/10/21	1045				2												X	X										
3	mw-6		W	G	5/10/21	1210				2												X	X										
4	mw-7		W	G	5/10/21	1315				2												X	X										
5	mw-14		W	G	5/10/21	1410				2												X	X										
6	DUP 051021		W	G	5/10/21	-				2												X	X										
7																																	
8																																	
9																																	
10																																	
11																																	
12																																	

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS			
**BNSF Tech Specs**				Jayden / Pace	5/11/21	10:20	7.4	Y	Y	Y

## SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: Brandon Kuntz

SIGNATURE of SAMPLER: 


DATE Signed (MM/DD/YY): 05/10/21

Temp in °C

Received on Ice (Y/N)

Custody Sealed Cooler (Y/N)

Samples Intact (Y/N)

	Document Name: <b>Sample Condition Upon Receipt (SCUR) - ESI</b>	Document Revised: 12Aug2020 <b>Page 1 of 1</b>
	Document No.: <b>ENV-FRM-MIN4-0149 Rev.01</b>	Pace Analytical Services - <b>Minneapolis</b>

**Sample Condition  
Upon Receipt - ESI  
Tech Specs**

Client Name:

Project #:

Kennedy Jenks BMSF

10559554

Courier: ☒ Fed Ex ☐ UPS ☐ USPS ☐ Client  
☐ Pace ☐ Speedee ☐ Commercial

Tracking Number: 1450 2247 1702 See Exceptions ☐  
ENV-FRM-MIN4-0142

Custody Seal on Cooler/Box Present? ☒ Yes ☐ No Seals Intact? ☒ Yes ☐ No Biological Tissue Frozen? ☐ Yes ☐ No ☒ N/A

Packing Material: ☒ Bubble Wrap ☐ Bubble Bags ☐ None ☐ Other: Temp Blank? ☒ Yes ☐ No

Thermometer: ☐ T1(0461) ☒ T2(1336) ☐ T3(0459) Type of Ice: ☒ Wet ☐ Blue ☐ None ☐ Dry ☐ Melted  
☐ T4(0254) ☐ T5(0489)

Temp should be above freezing to 6°C Cooler Temp Read w/temp blank: 7.4 °C Average Corrected Temp (no temp blank only): °C ☐ See Exceptions ENV-FRM-MIN4-0142 ☐ 1 Container  
Correction Factor: 0 Cooler Temp Corrected w/temp blank: 7.4 °C

USDA Regulated Soil: ( ☒ N/A, water sample/Other: )

Date/Initials of Person Examining Contents: 5/11/21 JT

Did samples originate in a quarantine zone within the United States: AL, AR, CA, FL, GA, ID, LA, MS, NC, NM, NY, OK, OR, SC, TN, TX or VA (check maps)? ☐ Yes ☐ No

Did samples originate from a foreign source (internationally, including Hawaii and Puerto Rico)? ☐ Yes ☐ No

If Yes to either question, fill out a Regulated Soil Checklist (F-MN-Q-338) and include with SCUR/COC paperwork.

		COMMENTS:
Chain of Custody Present and Filled Out?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	1.
Chain of Custody Relinquished?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	2.
Sampler Name and/or Signature on COC?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	3.
Samples Arrived within Hold Time?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	4.
Short Hold Time Analysis (<72 hr)?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	5. <input type="checkbox"/> Fecal Coliform <input type="checkbox"/> HPC <input type="checkbox"/> Total Coliform/E coli <input type="checkbox"/> BOD/cBOD <input type="checkbox"/> Hex Chrome <input type="checkbox"/> Turbidity <input type="checkbox"/> Nitrate <input type="checkbox"/> Nitrite <input type="checkbox"/> Orthophos
Rush Turn Around Time Requested?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	6.
Sufficient Sample Volume?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	7.
Triple Volume Provided for MS/MSD (if more than 10 samples)?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	8.
Correct Containers Used?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	9.
-Pace Containers Used?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	10. Is sediment visible in the dissolved container? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Containers Intact?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	11. If no, write ID/ Date/Time on Container Below: <input type="checkbox"/> See Exception ENV-FRM-MIN4-0142
Field Filtered Volume Received for Dissolved Tests?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	12. Sample # <u>001-006</u> <input type="checkbox"/> NaOH <input checked="" type="checkbox"/> HNO <sub>3</sub> <input type="checkbox"/> H <sub>2</sub> SO <sub>4</sub> <input type="checkbox"/> Zinc Acetate <u>1 1/1</u> <u>2-6 2/2</u> Positive for Res. <input type="checkbox"/> Yes <input type="checkbox"/> No pH Paper Lot# <u>221419</u> Res. Chlorine <input type="checkbox"/> 0-6 Roll <input type="checkbox"/> 0-6 Strip <input type="checkbox"/> 0-14 Strip
Is sufficient information available to reconcile the samples to the COC?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	13. <input type="checkbox"/> See Exception ENV-FRM-MIN4-0142
Matrix: <input checked="" type="checkbox"/> Water <input type="checkbox"/> Soil <input type="checkbox"/> Oil <input type="checkbox"/> Other		
All containers needing acid/base preservation have been checked?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
All containers needing preservation are found to be in compliance with EPA recommendation? (HNO <sub>3</sub> , H <sub>2</sub> SO <sub>4</sub> , <2pH, NaOH >9 Sulfide, NaOH >10 Cyanide)	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Exceptions: VOA, Coliform, TOC/DOC Oil and Grease, DRO/8015 (water) and Dioxin/PFAS *If adding preservative to a container it must be added to associated field and equipment blanks (verify with PM first)	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Extra labels present on soil VOA or WIDRO containers?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	14. Pace Trip Blank Lot # (if purchased):
Headspace in VOA Vials (greater than 6mm)?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
3 Trip Blanks Present?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Trip Blank Custody Seals Present?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	

Temp Log: Temp must be maintained at <6°C during login, record temp every 20 mins		
Opened Time: <u>1400</u>	Temp: <u>7.4</u>	Corrected Temp: <u>7.4</u>
Time: <u>1426</u>	put in cooler	
Time:	Temp:	Corrected Temp:

**CLIENT NOTIFICATION/RESOLUTION**

Field Data Required? ☐ Yes ☐ No

Person Contacted:

Date/Time:

Comments/Resolution: temp okay, metals only

Project Manager Review:

Date: 05/17/2021

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers)

Labeled by: (a/t) 02

**DATA VALIDATION SUMMARY**  
**BNSF Parkwater**

Laboratory Reports included in Data Validation	Dates	Sample IDs
<b>Laboratory:</b> Pace Analytical Services, Minneapolis, MN <b>SDG:</b> 10559554 <b>Analyses:</b> Metals	<b>Report Date:</b> 5/25/2021  <b>Sample Dates:</b> 5/10/2021-5/10/2021  <b>Validation Date:</b> 6/16/2021	Aqueous Samples: MW-14, MW-19, MW-6, MW-7  Field Duplicates: DUP 051021 (duplicate of MW-14)  Equipment Blank: Rinsate Trip Blank: Not Collected

Criteria	(Yes or No)	Comment
<u>Chain-of-Custody (COC)</u> – Chain-of-custody protocol followed?	No	See Note
<u>Temperature Blank</u> – Sample temperature criteria met?	No	See Note
<u>Holding times</u> – Samples analyzed within specified holding time?	Yes	
<u>Laboratory method blank samples</u> – Analytes present in method blank samples?	No	
<u>Field/Equipment blank samples</u> – Analytes present in field/equipment blank samples?	No	
<u>Trip blank samples</u> – Analytes present in trip blank samples?	No	See Note
<u>Matrix Spikes (MS)/Matrix Spike Duplicate (MSD) samples</u> – Control limits met?	Yes	
<u>Surrogate percent recoveries</u> – Control limits met?	Yes	See Note
<u>Laboratory Control Sample (LCS)</u> – Control limits met?	Yes	
<u>Laboratory duplicate samples (if applicable)</u> – Control limits met?	Yes	See Note
<u>Field duplicate samples (if submitted)</u> – Relative percent differences within control limits?	No	See Note
<u>Other Issues?</u>	No	

**COC Note:** Chain of custody (COC) was not properly documented, relinquished by signature, date and time were missing. Samples arrived at laboratory within 24 hours of date/time sampled, no action taken.

**Temperature Note:** Sample temperature upon receipt was 7.4°C, per SW846 guidelines metals samples do not require preservation by cooling, no action taken.

**Trip Blank Note:** Not Collected

**Surrogate Recovery Note:** Not applicable

**Lab Duplicate Note:** Not applicable

**Field Duplicate Note:** The RPD for the duplicate pair MW-14 and DUP 051021 ranged from 0-7%. The RPD was within acceptance criteria, no action taken.

#### SUMMARY

Overall, the findings with respect to the quality assurance/quality control (QA/QC) data do not adversely affect the use of the analytical results.