Kennedy Jenks

18 January 2021

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

Subject: Second Semiannual 2020 Groundwater Sampling Results
BNSF Railway Company, Parkwater Rail Yard
Spokane, Washington
KJ 2096110*00

Dear Ms. Treccani:

This letter summarizes the monitoring activities and presents the field and laboratory results for samples collected during the second semiannual 2020 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 (Consent Decree) 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. 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.

Field Activities

The second semiannual 2020 groundwater sampling event was conducted on 19 November 2020. Groundwater monitoring activities included measuring depth-to-water in monitoring wells, then purging

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

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[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 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 in 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. Dissolved arsenic results for the primary and duplicate samples from well MW-6 were qualified as estimated, "J", due to the results being less than the laboratory reporting limit. The relative percent difference (RPD) between the primary and duplicate samples for total and dissolved arsenic were 3.0 percent and 2.5 percent, respectively, which met acceptance criteria (up to 20 percent).

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 at the Site.

During the November 2020 sampling event, concentrations of total arsenic ranged from 0.00306 milligrams per liter (mg/L) in monitoring well MW-14 to 0.00416 mg/L in monitoring well MW-19. Reported concentrations of dissolved arsenic ranged from 0.000942 J mg/L in monitoring well MW-6 to 0.00389 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.

Total arsenic was last reported at concentrations above the Site-specific CUL in the primary sample from well MW-14 during the June 2020 sampling event. However, the duplicate sample collected from well MW-14 during the June 2020 sampling event was below the Site-specific CUL. The total arsenic concentrations reported in the primary and duplicate samples varied significantly (an RPD of 79.9 percent); however, the dissolved arsenic concentrations in the two samples were similar (an RPD of 2.3 percent). Because of the discrepancy between the primary and duplicate samples collected in June 2020, monitoring well MW-14 was resampled in July 2020. The July 2020 results from well MW-14 were below the CUL.

[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.

Samples have been collected from monitoring well MW-14 for concurrent analysis of total and dissolved arsenic during five monitoring events (March 2016, May 2019, June 2020, the July 2020 resample of MW-14, and November 2020), including primary and duplicate analyses in March 2016, May 2019, and June 2020. Excluding the June 2020 primary result, the average ratio between total and dissolved arsenic concentrations for MW-14 was 1.04, with a maximum difference between total and dissolved results of 0.00053 mg/L, indicating that the reported arsenic is predominantly in the dissolved phase. In June 2020, the ratio for the primary sample results was 2.1 with a difference of 0.00436 mg/L, further indicating an inconsistency in sampling results compared to previous data. The discrepancy between the primary and duplicate total arsenic results from the sample collected from MW-14 in June 2020, as well as the discrepancy between the total and dissolved arsenic concentrations in the primary sample, suggest the June 2020 primary sample result is anomalous and not representative.

Since shutdown of the remediation system in March 2016, 12 groundwater monitoring events have occurred, resulting in the collection of 49 samples (including 12 primary/duplicate sample pairs). Total arsenic concentrations in 42 samples (including nine primary/duplicate sample pairs) have been below the CUL. Total arsenic concentrations in seven samples have been reported above the CUL. In those seven samples, the results for one primary/duplicate pair were above the CUL, while only the primary sample result of two other primary/duplicate pairs was above the CUL.

Summary and Conclusions

Total and dissolved arsenic concentrations reported in the four wells sampled in November 2020 were below the CUL of 0.005 mg/L.

Arsenic concentrations were below the Site specific CUL in the two semiannual 2019 events (total and dissolved arsenic in May 2019 and total arsenic in November 2019), the first semiannual 2020 event (June/July 2020 samples), and the second semiannual 2020 event (November 2020 samples). The November 2020 sampling event is the last sampling event needed to meet the closure requirement of four consecutive monitoring events with results below the CUL. In accordance with the Consent Decree and the CMP, Kennedy/Jenks Consultants, Inc. recommends that groundwater monitoring at the Site be discontinued and Site monitoring wells decommissioned.

Please contact us at (503) 423-4018 if you have questions regarding the above information.

Very truly yours,

Kennedy/Jenks Consultants, Inc.

1/18/2021

Alice Robinson
Project Engineer

Ryan Hultgren, P.E.
Principal Engineer

cc: Shane DeGross, BNSF Railway Company

Attachments:

- Table 1 – Groundwater Elevation Summary 19 November 2020
- Table 2 – Water Quality Parameters Summary
- Table 3 – 2016-2020 Groundwater Analytical Results Summary
- Figure 1 – Groundwater Potentiometric Map, 16 June 2020
- Figure 2 – Groundwater Results Map, 2016-2020
- 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
19 November 2020
BNSF Parkwater Rail Yard
Spokane, Washington

Well Number	Date	Top of Casing Elevation (feet)[(a)]	Depth to Groundwater (feet btoc)[(b)]	Groundwater Elevation (feet amsl)[(c)]
MW-4	11/19/2020	1,950.76	65.03	1,885.73
MW-6	11/19/2020	1,951.04	66.16	1,884.88
MW-7	11/19/2020	1,951.13	66.32	1,884.81
MW-11	11/19/2020	1,951.20	68.94	1,882.26
MW-14	11/19/2020	1,951.41	67.05	1,884.36
MW-16	11/19/2020	1,950.44	66.75	1,883.69
MW-19	11/19/2020	1,951.24	66.42	1,884.82

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

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	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
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
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
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

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

2016-2020 GROUNDWATER ANALYTICAL RESULTS SUMMARY
BNSF Parkwater Rail Yard, Spokane, Washington

Sample ID[a]	Monitoring Well ID[a]	Date	Total Arsenic[b] (mg/L)		Dissolved Arsenic[b] (mg/L)		Diesel-Range Organics[c] (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	**0.00505**		--		0.131	B	5.78
MW6-110716		11/07/2016	0.00450		--		**1.560**		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	**0.02090**		--		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
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	**0.00548**		--		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
MW14-031516	MW-14	03/15/2016	0.00283/0.00289[d]		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		--/--		**0.647/0.648**		0.88
MW14-030817		03/08/2017	**0.0104/0.0107**		--/--		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	**0.00548**/0.00331		--/--		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	**0.00820**/0.00352	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
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	**0.00564**		--		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
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	--

TABLE 3

2016-2020 GROUNDWATER ANALYTICAL RESULTS SUMMARY
BNSF Parkwater Rail Yard, Spokane, Washington

Sample ID[a]	Monitoring Well ID[a]	Date	Total Arsenic[b] (mg/L)		Dissolved Arsenic[b] (mg/L)		Diesel-Range Organics[c] (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	--		--		--
EDR Site-Specific Cleanup Levels	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, 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

Path: \\kjc.local\KJC-Root\KJ-Office\FWY\bnsfdata\BNSF Washington\Parkwater\Events\2020 Events\2020 SA2 Report\Fig1_ParkwaterGWContours.mxd

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
- Interpreted Groundwater Flow Direction
- Intepreted Groundwater Elevation Contours (feet AMSL, dashed where inferred)
- Fueling Area

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

N

0 75 150

Scale: Feet

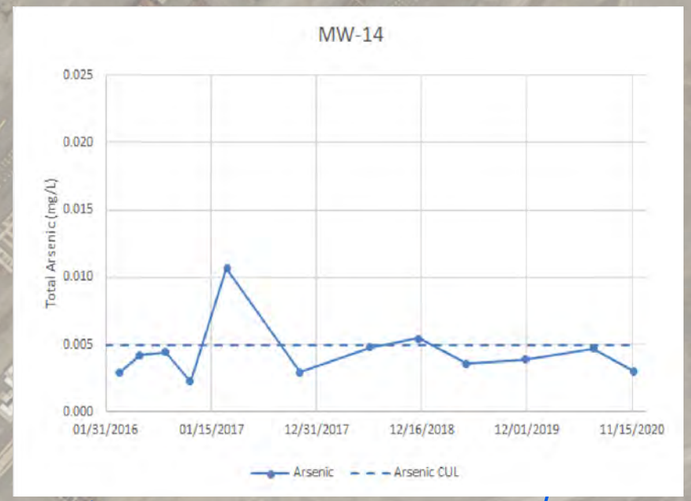
Kennedy/Jenks Consultants

BNSF Railway Company
Parkwater Railyard
Spokane, Washington

Interpreted November 2020 Groundwater Elevation Contour Map

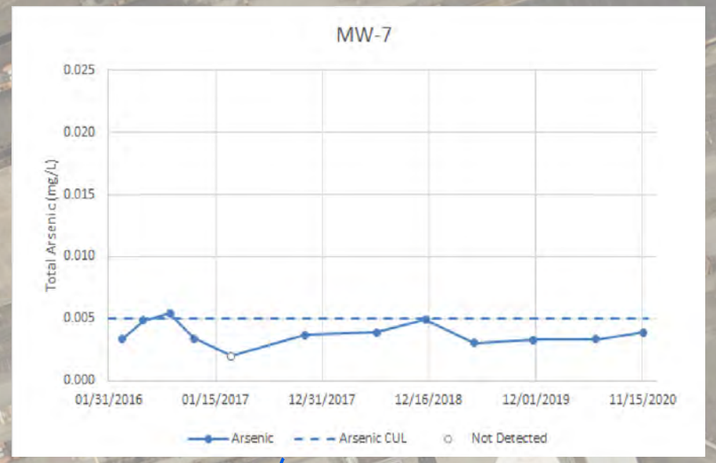
2096110*00
January 2021

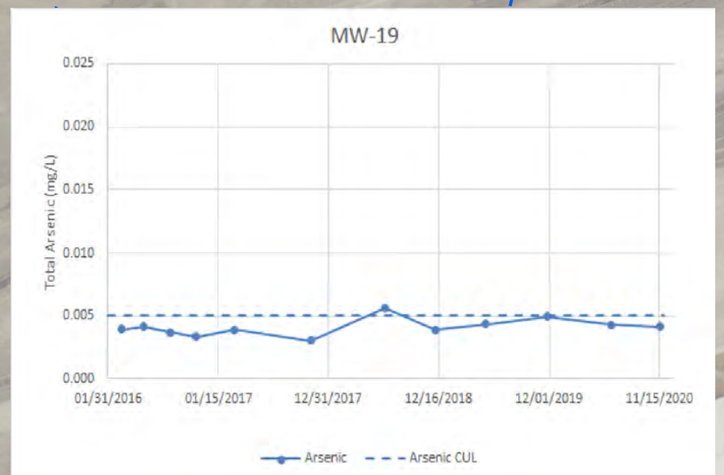
Figure 1



MW-14	
Date	Total As
3/15/16	0.00283/0.00289
5/24/16	0.00423/0.00397
8/17/16	0.00445/0.00371
11/7/16	0.00223/0.00225
3/8/17	**0.0104/0.0107**
11/6/17	0.00286/0.00295
6/28/18	0.00482/0.00474
12/5/18	**0.00548**/0.00331
5/14/19	0.00323/0.00358
11/25/19	0.00381/0.00390
7/8/20	0.00473
11/19/20	0.00306

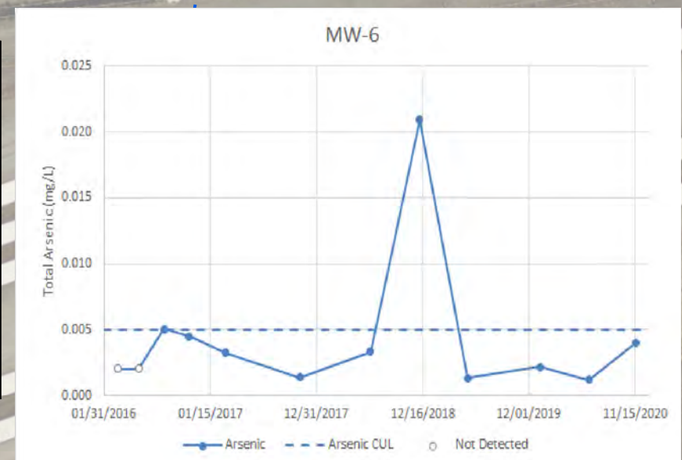
MW-7	
Date	Total As
3/15/16	0.00336
5/24/16	0.00485
8/17/16	**0.00548**
11/7/16	0.00342
3/8/17	0.002 U
11/6/17	0.00370
6/28/18	0.00388
12/5/18	0.00495
5/14/19	0.00305
11/25/19	0.00332
6/16/20	0.00334
11/19/20	0.00389





MW-19	
Date	Total As
3/15/16	0.00394
5/24/16	0.00416
8/17/16	0.00367
11/7/16	0.00334
3/8/17	0.00387
11/6/17	0.00302
6/28/18	**0.00564**
12/5/18	0.00389
5/14/19	0.00432
11/25/19	0.00496
6/16/20	0.00429
11/19/20	0.00416

MW-6	
Date	Total As
3/15/16	0.002 U
5/24/16	0.002 U
8/17/16	**0.00505**
11/7/16	0.00450
3/8/17	0.00323
11/6/17	0.00139 J
6/28/18	0.00334
12/5/18	**0.02090**
5/14/19	0.00131 J
1/8/20	0.00217
6/16/20	0.00117 J
11/19/20	0.00391/0.00403



Path: N:\BNSF Washington\ParkwaterEvents\2020 Events\2020 SA2 Report\Fig2_GWResultsMap.mxd

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
- Interpreted Groundwater Flow Direction
- Intepreted Groundwater Elevation Contours (feet AMSL, dashed where inferred)

Note:

1. Locations are approximate.
2. Groundwater results are in milligrams per liter (mg/L).
3. 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.
4. June 2020 result for MW-14 is omitted from trend plots.

N

0 40 80

Scale: Feet

Kennedy/Jenks Consultants

BNSF Railway Company
Parkwater Railyard
Spokane, Washington

Groundwater Results Map 2016-2020

2096110*00
January 2021

Figure 2

Attachment A

Spokane Environmental Services
Monitoring Well Sampling Field Log

Monitoring Well Sampling Field Log

SPOKANE ENVIRONMENTAL SOLUTIONS

Well Number: MW-4

Date: 11.19.20

Project Information	
Project Name:	Parkwater
Project Number:	0110-001

Sampling Information	
Field Team:	GP
Purge Method:	Low Flow
Sampling Method:	Low Flow
Water Quality Meter:	Model: U-52
	Serial Number: U-101741 X
Purge Water Disposition:	Drums

Comments

Dup

Decon Pump

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)
66.16		

Sample Containers

Number	Type	Preservative	Analytical Parameters	Filtered?
2	Poly	NACID	As	N
2	Poly	NACID	As	Y

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 66.16	-	±3%	±10%	±0.1	±10mv	±10%	<= Stabilization Criteria
5		~80mL		10.40	0.287	6.77	6.97	194	13.1	Clear
10				10.78	0.290	0.22	6.75	134	0.9	
15				11.10	0.291	0.00	6.67	91	0.0	
20				11.25	0.290	0.00	6.65	68	0.00	
25				11.29	0.290	0.00	6.66	60	0.00	
30			66.18	11.30	0.290	0.00	6.67	56	0.00	
	2.5					S				

Start Sampling	11:20	Sample ID: MW-4-111920	Sample Time: 11:20
End Sampling	11:25	QA/QC Sample ID: Dup-111920	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

Monitoring Well Sampling Field Log

SPOKANE ENVIRONMENTAL SOLUTIONS

Well Number: MW-7

Date: 11-19-20

Project Information	
Project Name:	PARKWATER
Project Number:	0110-001

Sampling Information	
Field Team:	GP
Purge Method:	Low Flow
Sampling Method:	Low Flow
Water Quality Meter:	Model: U-52
	Serial Number: X-101741X
Purge Water Disposition:	DRUM

Comments

Decon Pump

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)
66.32		

Sample Containers

Number	Type	Preservative	Analytical Parameters	Filtered?
1	Poly	N ACID	As	N
1	Poly	N ACID	As	Y

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 66.32	-	±3%	±10%	±0.1	±10mv	±10%	<= Stabilization Criteria
5		~80mL		10.33	0.260	7.26	6.86	123	2.4	
10				10.50	0.258	7.12	7.11	63	0.0	
15				10.68	0.254	4.24	7.30	79	0.0	
20				10.70	0.253	4.43	7.35	92	0.0	
25				10.80	0.250	4.23	7.51	116	0.0	
30				10.82	0.249	4.29	7.58	132	0.0	
35	34		66.33	10.83	0.249	4.26	7.60	132	0.0	

Start Sampling	1250	Sample ID: MW-7-111920	Sample Time: 1250
End Sampling	1300	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

Monitoring Well Sampling Field Log

SPOKANE ENVIRONMENTAL SOLUTIONS

Well Number: MW-14

Date: 11.19.20

Project Information	
Project Name:	PARK WATER
Project Number:	0110.0001

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

Comments

DEDON PUMP - EB - 11.19.20

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)
67.05		

Sample Containers

Number	Type	Preservative	Analytical Parameters	Filtered?
1	Poly	NACID	As	N
1	Poly	NAND	As	Y

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 67.05	-	±3%	±10%	±0.1	±10mv	±10%	<= Stabilization Criteria
5		~80mL		10.56	0.350	2.67	7.27	-19	0.0	
10				10.58	0.349	0.35	7.06	-33	0.0	
15				10.61	0.348	0.27	7.03	-34	0.0	
20				10.64	0.345	0.37	7.03	-28	0.0	
25				10.72	0.341	0.48	7.04	-26	0.0	
30				10.84	0.338	0.38	7.06	-24	0.0	
35	3L		67.05	10.87	0.338	0.46	7.10	-24	0.0	
						S				

	Start Sampling 1345	Sample ID: MW-14-111920	Sample Time: 1345
	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

Monitoring Well Sampling Field Log

SPOKANE ENVIRONMENTAL SOLUTIONS

Well Number: MW-19

Date: 11-19-20

Project Information	
Project Name:	Parkwater
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: U-101741 X
Purge Water Disposition:	Drum on site

Comments

Sample was clear - no sed in bucket.

Decon pump.

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)
66.42		

Sample Containers

Number	Type	Preservative	Analytical Parameters	Filtered?
1	Poly	NAcid	As Total	
1	Poly	NAcid	As Diss	Y

Well Purge Data

Time	Volume Purged (L)	Purge Rate (L/min) (<0.5 L/min)	DTW (ft btoc)	Temp. (°C)	Conductivity (mS/cm)	D.O. (mg/L)	pH	ORP (mV)	Turbidity (NTUs)	Clarity/Color/ Remarks
	Pump On		Initial 66.42	-	±3%	±10%	±0.1	±10mv	±10%	<= Stabilization Criteria
5		<80		13.70	0.313	10.33	6.99	106	50.3	
10				13.07	0.312	6.61	7.13	128	50.0	
15				12.47	0.287	5.50	7.18	149	54.1	
20				12.33	0.263	5.41	7.23	156	44.6	
25				12.08	0.253	4.80	7.25	165	43.3	
30				12.23	0.251	4.71	7.24	177	44.1	
35				11.89	0.251	4.57	7.27	177	44.9	
40			66.42	11.79	0.250	4.55	7.28	177	46.6	clear
	2.8						5			

	Start Sampling	1010	Sample ID: MW-19-111920	Sample Time:	1010
	End Sampling	1020	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

DTW:

MW-4	65.03
MW-16	66.75
MW-11	68.94

Kennedy/Jenks Con-BNSF Region 1

275 Battery Street, Ste 550
San Francisco, CA 94111

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

Pres Chk

Report to: Alice Robinson

Email To: RyanHultgren@kennedyjenks.com;AliceRobinso

Project Description: BNSF - Parkwater, WA

City/State Collected: Spokane, WA

Please Circle: (PT) MT CT ET

Phone: 503-423-4000

Client Project #

Lab Project # BNSF1KEN-PARKWATER

Collected by (print): GARY PANTHER

Site/Facility ID #

P.O. #

Collected by (signature):

Immediately Packed on Ice N ___ Y X

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

Quote #

Date Results Needed

Analysis / Container / Preservative

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	Dissolved As (FF) 250mlHDPE-HNO3	Total As 250mlHDPE-HNO3
MW-19-111920	G	GW		11.19.20	1010	2	X	X
MW-6-111920	G	GW		11.19.20	1120	2	X	X
MW-7-111920	G	GW		11.19.20	1250	2	X	X
MW-14-11-1920	G	GW		11.19.20	1345	2	X	X
DUP-11-1920	G	GW		11.19.20	—	2	X	X
EB-111920	G	GW		11.19.20	1400	2	X	X
		GW				2	X	X
		GW				2	X	X

Invoice:
Customer : PNPOR
Phone : (615)758-5858
Sat Del : N
Date : 070ct20
Weight : 10 LBS
COD :
DV :
0.00
Shipping : 0.00
Special : 0.00
Handling : 0.00
Total : 0.00
Svcs: STANDARD OVERNIGHT
TRCK: 9186 2508 0243

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

SDG #

Table #

Acctnum: BNSF1KEN
Template: T110283
Prelogin: P808784
PM: 134 - Mark W. Beasley
PB:

Shipped Via:

Remarks | Sample # (lab only)

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

Remarks:

pH _____ Temp _____

Flow _____ Other _____

Samples returned via:
__ UPS X FedEx __ Courier _____

Tracking # 9186 2508 0243

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
RAD Screen <0.5 mR/hr:	__Y __N

Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)	Trip Blank Received: Yes / No HCL / MeoH TBR	
Gary D Panther	11-19-20	1530			
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

JOB TITLE KJ - BNSF - PARKWATER GW M

JOB NO. 0110-001 CALCULATION NO.

ORIGINATOR GP DATE 11-19-20

REVIEWER DATE

SCALE SHEET NO. 1 OF 1

Onsite 0800. NO FLAGGER. FLAVIO TO OFFICE (BV) TO FIND OUT WHATS HAPPENING.

0845 FLAVIO & JC ARRIVE: JC HAS A NEW PHONE #. D:D NOT KNOW WE WERE ON SITE

WALKED SITE. LOCATED WELLS - POPPED CAPS ON ALL TO BE SAMPLED OR MEASURED.

0945 SET UP ON MW-19. FIELD SHEETS DOCUMENT SITE ACTIVITES.

COLLECTED DUP. 111920 from MW-6

COLLECTED EQUIP BLANK on PUMP (EB-111920)

UPON COMPLETION of SAMPLING. USED KROGER DI AS NONE SUPPLIED BY LAB.

DEPARTED SITE 16:00

16:00 DROVE TO OFFICE. REPACKED SAMPLES ON FRESH ICE. DELIVERED TO FED EX. RETURNED TO OFFICE.

11/19/20

Grid: 8x8 = 1"

Attachment B

Laboratory Analytical Report and
Chain-of-Custody Documentation

DATA VALIDATION SUMMARY
BNSF Parkwater

Laboratory Reports included in Data Validation	Dates	Sample IDs
Laboratory: Pace Analytical Services, Mt.Juliet, TN **SDG:** L1288337 **Analyses:** Metals	**Report Date:** 11/24/2020 **Sample Dates:** 11/19/2020-11/19/2020 **Validation Date:** 12/14/2020	Aqueous Samples: MW-6-111920, MW-7-111920, MW-14-111920, MW-19-111920 Field Duplicates: DUP-11-1920 (duplicate of MW-6-111920) Equipment Blank: EB-111920 Trip Blank: Not Collected

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

Trip Blank Note: Not Collected
MS/MSD Note: Not applicable
Surrogate Recovery Note: Not applicable
Lab Duplicate Note: Not applicable
Field Duplicate Note: The RPD for the duplicate pair MW-6-111920 and DUP-11-1920 ranged from 0-3%. The RPD was within acceptance limits. No action taken.
Other Note: Custody seals not present. 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.

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National Center for Testing & Innovation

ANALYTICAL REPORT

November 24, 2020

Kennedy/Jenks Con-BNSF Region 1

Sample Delivery Group:	L1288337
Samples Received:	11/20/2020
Project Number:	
Description:	BNSF - Parkwater, WA

Report To: Alice Robinson
275 Battery Street, Ste 550
San Francisco, CA 94111

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 Analytical National is performed per guidance provided in laboratory standard operating procedures ENV-SOP-MTJL-0067 and ENV-SOP-MTJL-0068. Where sampling conducted by the customer, results relate to the accuracy of the information provided, and as the samples are received.

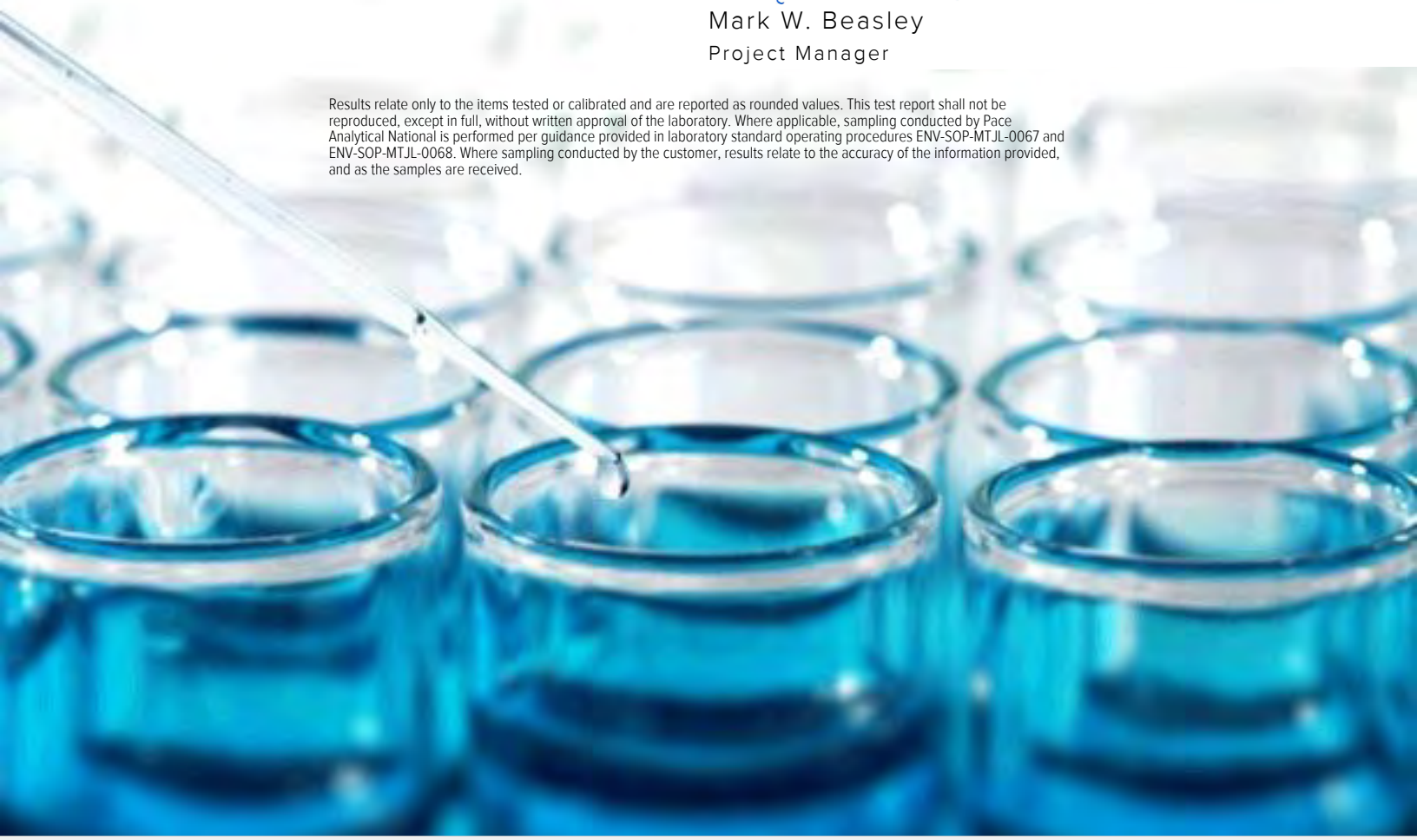


TABLE OF CONTENTS

MW-6-111920 L1288337-01 GW

Collected by: Gary Panther | Collected date/time: 11/19/20 11:20 | Received date/time: 11/20/20 09:15

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Metals (ICPMS) by Method 6020B	WG1580733	1	11/22/20 18:04	11/22/20 22:23	LD	Mt. Juliet, TN
Metals (ICPMS) by Method 6020B	WG1580743	1	11/22/20 23:58	11/23/20 18:58	LD	Mt. Juliet, TN

MW-7-111920 L1288337-02 GW

Collected by: Gary Panther | Collected date/time: 11/19/20 12:50 | Received date/time: 11/20/20 09:15

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Metals (ICPMS) by Method 6020B	WG1580733	1	11/22/20 18:04	11/22/20 22:26	LD	Mt. Juliet, TN
Metals (ICPMS) by Method 6020B	WG1580743	1	11/22/20 23:58	11/23/20 19:01	LD	Mt. Juliet, TN

MW-14-111920 L1288337-03 GW

Collected by: Gary Panther | Collected date/time: 11/19/20 13:45 | Received date/time: 11/20/20 09:15

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Metals (ICPMS) by Method 6020B	WG1580733	1	11/22/20 18:04	11/22/20 22:29	LD	Mt. Juliet, TN
Metals (ICPMS) by Method 6020B	WG1580743	1	11/22/20 23:58	11/23/20 19:04	LD	Mt. Juliet, TN

DUP-11-1920 L1288337-04 GW

Collected by: Gary Panther | Collected date/time: 11/19/20 00:00 | Received date/time: 11/20/20 09:15

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Metals (ICPMS) by Method 6020B	WG1580733	1	11/22/20 18:04	11/22/20 22:33	LD	Mt. Juliet, TN
Metals (ICPMS) by Method 6020B	WG1580743	1	11/22/20 23:58	11/23/20 19:08	LD	Mt. Juliet, TN

EB-111920 L1288337-06 GW

Collected by: Gary Panther | Collected date/time: 11/19/20 14:00 | Received date/time: 11/20/20 09:15

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Metals (ICPMS) by Method 6020B	WG1580743	1	11/22/20 23:58	11/23/20 19:11	LD	Mt. Juliet, TN

MW-19-111920 L1288337-07 GW

Collected by: Gary Panther | Collected date/time: 11/19/20 10:10 | Received date/time: 11/20/20 09:15

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Metals (ICPMS) by Method 6020B	WG1580733	1	11/22/20 18:04	11/22/20 22:36	LD	Mt. Juliet, TN
Metals (ICPMS) by Method 6020B	WG1580743	1	11/22/20 23:58	11/23/20 19:14	LD	Mt. Juliet, TN

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	3.91		0.180	2.00	1	11/23/2020 18:58	WG1580743
Arsenic,Dissolved	0.942	J	0.180	2.00	1	11/22/2020 22:23	WG1580733

Metals (ICPMS) by Method 6020B

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	ug/l		ug/l	ug/l		date / time	
Arsenic	3.89		0.180	2.00	1	11/23/2020 19:01	WG1580743
Arsenic,Dissolved	3.88		0.180	2.00	1	11/22/2020 22:26	WG1580733

Metals (ICPMS) by Method 6020B

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	ug/l		ug/l	ug/l		date / time	
Arsenic	3.06		0.180	2.00	1	11/23/2020 19:04	WG1580743
Arsenic,Dissolved	2.97		0.180	2.00	1	11/22/2020 22:29	WG1580733

Metals (ICPMS) by Method 6020B

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	ug/l		ug/l	ug/l		date / time	
Arsenic	4.03		0.180	2.00	1	11/23/2020 19:08	WG1580743
Arsenic,Dissolved	0.966	J	0.180	2.00	1	11/22/2020 22:33	WG1580733

Metals (ICPMS) by Method 6020B

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	ug/l		ug/l	ug/l		date / time	
Arsenic	U		0.180	2.00	1	11/23/2020 19:11	WG1580743

Metals (ICPMS) by Method 6020B

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis	Batch
	ug/l		ug/l	ug/l		date / time	
Arsenic	4.16		0.180	2.00	1	11/23/2020 19:14	WG1580743
Arsenic,Dissolved	3.89		0.180	2.00	1	11/22/2020 22:36	WG1580733

Method Blank (MB)

(MB) R3596124-1 11/22/20 21:47

Analyte	MB Result	MB Qualifier	MB MDL	MB RDL
	ug/l		ug/l	ug/l
Arsenic,Dissolved	U		0.180	2.00

Laboratory Control Sample (LCS)

(LCS) R3596124-2 11/22/20 21:51

Analyte	Spike Amount	LCS Result	LCS Rec.	Rec. Limits	LCS Qualifier
	ug/l	ug/l	%	%	
Arsenic,Dissolved	50.0	48.4	96.8	80.0-120	

L1284748-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1284748-01 11/22/20 21:54 • (MS) R3596124-4 11/22/20 22:01 • (MSD) R3596124-5 11/22/20 22:04

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	%	%		%			%	%
Arsenic,Dissolved	50.0		49.5	50.7	98.3	101	1	75.0-125			2.56	20

Method Blank (MB)

(MB) R3596617-1 11/23/20 18:23

Analyte	MB Result ug/l	MB Qualifier	MB MDL ug/l	MB RDL ug/l
Arsenic	U		0.180	2.00

Laboratory Control Sample (LCS)

(LCS) R3596617-2 11/23/20 18:27

Analyte	Spike Amount ug/l	LCS Result ug/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
Arsenic	50.0	49.3	98.6	80.0-120	

L1286835-03 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1286835-03 11/23/20 18:30 • (MS) R3596617-4 11/23/20 18:36 • (MSD) R3596617-5 11/23/20 18:40

Analyte	Spike Amount ug/l	Original Result ug/l	MS Result ug/l	MSD Result ug/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Arsenic	50.0	3.09	53.2	51.3	100	96.5	1	75.0-125			3.59	20

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.

Results Disclaimer - Information that may be provided by the customer, and contained within this report, include Permit Limits, Project Name, Sample ID, Sample Matrix, Sample Preservation, Field Blanks, Field Spikes, Field Duplicates, On-Site Data, Sampling Collection Dates/Times, and Sampling Location. Results relate to the accuracy of this information provided, and as the samples are received.

Abbreviations and Definitions

MDL	Method Detection Limit.
RDL	Reported Detection Limit.
Rec.	Recovery.
RPD	Relative Percent Difference.
SDG	Sample Delivery Group.
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.

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

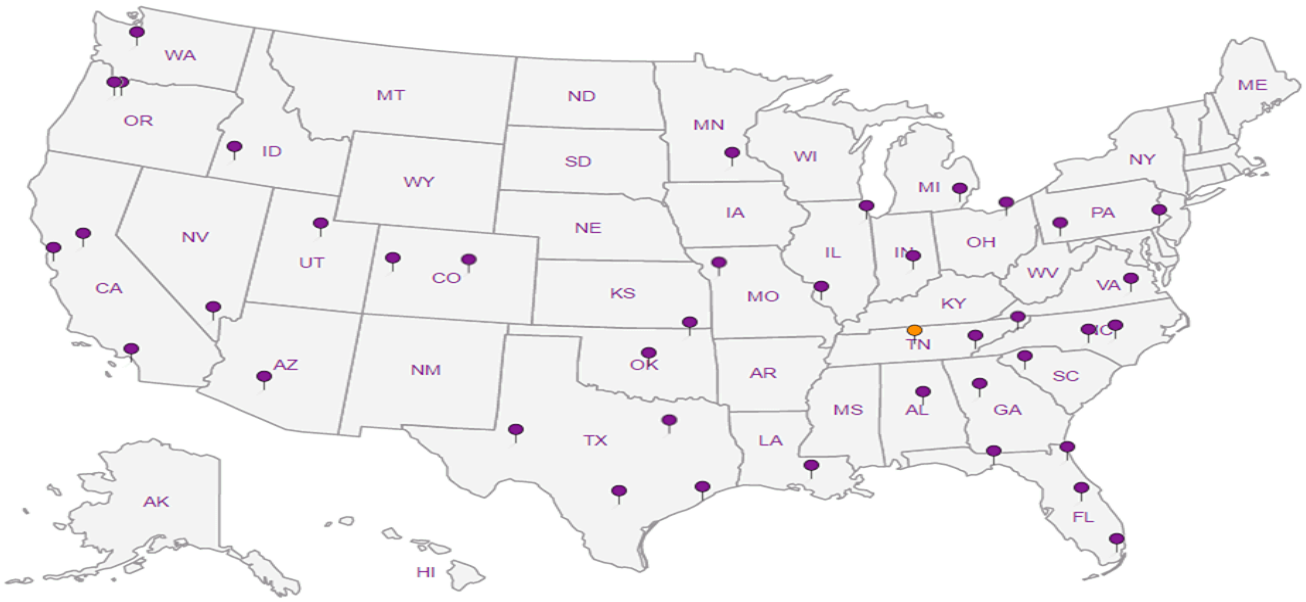
Third Party Federal Accreditations

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

275 Battery Street, Ste 550
San Francisco, CA 94111

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

Pres Chk

Report to: Alice Robinson

Email To: RyanHultgren@kennedyjenks.com;AliceRobinso

Project Description: BNSF - Parkwater, WA

City/State Collected: Spokane, WA

Please Circle: (PT) MT CT ET

Phone: 503-423-4000

Client Project #

Lab Project # BNSF1KEN-PARKWATER

Collected by (print): GARY PANTHER

Site/Facility ID #

P.O. #

Collected by (signature):

Immediately Packed on Ice N ___ Y X

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

Quote #

Date Results Needed

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	Dissolved As (FF) 250mlHDPE-HNO3	Total As 250mlHDPE-HNO3	Remarks	Sample # (lab only)
MW-19-111920	G	GW		11.19.20	1010	2	X	X		-01
MW-6-111920	G	GW		11.19.20	1120	2	X	X		-02
MW-7-111920	G	GW		11.19.20	1250	2	X	X		-03
MW-14-11-1920	G	GW		11.19.20	1345	2	X	X		-04
DUP-11-1920	G	GW		11.19.20	—	2	X	X		-05
EB-111920	G	GW		11-19-20	1400	1	X	X		-06
		GW				2	X	X		
		GW				2	X	X		

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

SDG # L1288337

Table # B110

Acctnum: BNSF1KEN

Template: T110283

Prelogin: P808784

PM: 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:

pH _____ Temp _____

Flow _____ Other _____

Samples returned via:
__ UPS X FedEx __ Courier _____

Tracking # 9186 2508 0243

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
RAD Screen <0.5 mR/hr: Y N

Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)	Trip Blank Received: Yes / NO HCL / MeoH TBR
Dawn D Panther	11-19-20	1530		
Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)	Temp: +.4 °C Bottles Received:
				2.9 3.3 11
Relinquished by : (Signature)	Date:	Time:	Received for lab by: (Signature)	Date: Time:
				11/20/20 1048

If preservation required by Login: Date/Time

Hold: 11-160

Condition: NCF / (OK)