

Appendix G

Groundwater Monitoring Field Forms

15 to 17 November 2016

Groundwater Purge and Sample Form

Date: _____

Kennedy/Jenks Consultants

PROJECT NAME: _____

WELL NUMBER: RMD-1

PROJECT NUMBER: _____

PERSONNEL: _____

STATIC WATER LEVEL (FT): _____

MEASURING POINT DESCRIPTION: _____

WATER LEVEL MEASUREMENT METHOD: _____

PURGE METHOD: _____

TIME START PURGE: _____

PURGE DEPTH (FT) _____

TIME END PURGE: _____

TIME SAMPLED: _____

COMMENTS: _____

WELL VOLUME CALCULATION (FILL IN BEFORE PURGING)	TOTAL DEPTH (FT)	-	DEPTH TO WATER (FT)	=	WATER COLUMN (FT)	X	MULTIPLIER FOR CASING DIAMETER (IN)			=	CASING VOLUME (GAL)
							2	4	6		
							0.16	0.64	1.44		

TIME	9:05	9:10	9:15	9:20			
VOLUME PURGED (GAL)	1	2					
PURGE RATE (GPM) ^{ml/min}	200	200					
TEMPERATURE (°C)	15.51	15.78	15.81	15.81			
pH	7.26	7.35	7.37	7.37			
SPECIFIC CONDUCTIVITY (uncorrected) ^{ms/cm} (micromhos)	0.782	0.784	0.785	0.786			
DISSOLVED OXYGEN (mg/L)	3.11	1.71	1.37	1.29			
eh(MV)Pt-AgCl ref.	260.9	244.5	213.7	199.3			
TURBIDITY/COLOR	3.68	2.62	4.06	2.82			
ODOR							
DEPTH OF PURGE INTAKE (FT)	1						
DEPTH TO WATER DURING PURGE (FT)	15.61	15.46	15.54	15.55			
NUMBER OF CASING VOLUMES REMOVED							
DEWATERED?							

GROUNDWATER SAMPLING DATA SHEET

Project Name: Wishram	#	Well # RMOZ
Field Personnel: Robinson/Sawdey	Date: 11-16-16	Page: 1 Of 1
Purge/Sampling Method: Peristaltic pump		Well Elev.(msl)*:
Water Containment Method: Drum		SWL*:
Field Instrument(s) Used: Geoprobe, YSI, Solinst		SWL Elev. (msl):

WATER LEVEL DATA*		WELL DATA		PURGE VOLUME CALCULATION	
Well Depth / Length of Casing*		Casing Diameter (in.)	NA	Calculated Borehole Volume (BV) = _____ Is L ₁ >L ₂ ? Yes _____ No _____	
Initial SWL*		Borehole Diameter (in.)	NA	Yes: BV = L ₁ _____ x V ₁ _____ + L ₂ _____ x V ₂ _____ = _____ gals.	
Length of Water Column (L ₁)		Casing Volume Factor (V ₁)**	NA	No: BV = L ₁ _____ x V ₁ _____ + V ₂ _____	
Sample Depth / Pump Intake*		Annular Volume Factor (V ₂)**	NA	Total Purge Volume = BV _____ x no. of borehole volumes _____ = _____ gals.	
Purge Rate (approx. gpm)		Length of Water Column (ft.) = L ₁	NA	Actual Gals. Purged	_____ gals
Well Stick-up (ft)		Length of Filter Pack (ft.) = L ₂	NA	No. of BV's Purged	NA
		Porosity of Filter Pack (%)**	NA		

MICROPURGE

Time	Cumulative Gallons Purged	Temperature C / F	Conductivity mS/cm	pH	Dissolved Oxygen	Redox/ORP (mV)	COMMENTS (i.e.- odor, sediment, color)
10:22	1	16.03	0.855	7.34	1.65	195.3	clear, no odor
10:27	2	16.48	0.890	7.34	0.48	158.7	
10:32	3	16.46	0.902	7.34	0.36	145.3	
10:37	4	16.54	0.911	7.34	0.25	131.1	
10:42	5	16.66	0.917	7.35	0.22	114.2	

SAMPLE DATA

Sample I.D.	Time Collected	Container Type	Volume	Preservative	# Containers	Analysis Required	COMMENTS

TOC = top of PVC casing * Measured from TOC **see Casing / Annular Volume Factors Table

Kennedy/Jenks Consultants

GROUNDWATER SAMPLING DATA SHEET

Project Name: Wishram	#	Well # <u>AM03</u>
Field Personnel: Robinson/Sawdey	Date:	Page: 1 Of 1
Purge/Sampling Method: Peristaltic pump		Well Elev.(msl)*:
Water Containment Method: Drum		SWL*:
Field Instrument(s) Used: Geoprobe, YSI, Solinst		SWL Elev. (msl):

WATER LEVEL DATA*	WELL DATA	PURGE VOLUME CALCULATION
Well Depth / Length of Casing*	Casing Diameter (in.) NA	MICROPURGE
Initial SWL*	Borehole Diameter (in.) NA	
Length of Water Column (L ₁)	Casing Volume Factor (V ₁)** Annular Volume Factor (V ₂)** NA	
Sample Depth / Pump Intake*	Length of Water Column (ft.) = L ₁ NA	
Purge Rate (approx. gpm)	Length of Filter Pack (ft.) = L ₂	
Well Stick-up (ft)	Porosity of Filter Pack (%)** NA	
		Calculated Borehole Volume (BV) = _____ Is L ₁ >L ₂ ? Yes _____ No _____ Yes: BV = L ₁ _____ x V ₁ _____ + L ₂ _____ x V ₂ _____ = _____ gals. No: BV = L ₁ _____ x V ₁ _____ + V ₂ _____ = _____ gals. Total Purge Volume = BV _____ x no. of borehole volumes _____ = _____ gals. Actual Gals. Purged _____ gals No. of BV's Purged _____ NA

Time	Cumulative Gallons Purged	Temperature C / F	Conductivity mS/cm	pH	Dissolved Oxygen	Redox/ORP (mV)	COMMENTS (i.e.- odor, sediment, color)	
<u>15:30</u>	<u>1</u>	<u>15.39</u>	<u>477</u>	<u>7.61</u>	<u>1.00</u>	<u>204.5</u>	<u>4.26</u>	<u>15.06</u>
<u>16:35</u>	<u>2</u>	<u>15.40</u>	<u>487</u>	<u>7.63</u>	<u>0.45</u>	<u>117.6</u>	<u>3.81</u>	<u>15.06</u>
<u>16:40</u>	<u>3</u>	<u>15.39</u>	<u>496</u>	<u>7.62</u>	<u>0.42</u>	<u>99.9</u>	<u>2.79</u>	<u>15.06</u>

SAMPLE DATA							
Sample I.D.	Time Collected	Container Type	Volume	Preservative	# Containers	Analysis Required	COMMENTS

TOC = top of PVC casing * Measured from TOC **see Casing / Annular Volume Factors Table

GROUNDWATER SAMPLING DATA SHEET

Project Name: Wishram	#	Well # <u>RMD4</u>
Field Personnel: Robinson/Sawdey	Date:	Page: 1 Of 1
Purge/Sampling Method: Peristaltic pump		Well Elev.(msl)*:
Water Containment Method: Drum		SWL*:
Field Instrument(s) Used: Geoprobe, YSI, Solinst		SWL Elev. (msl):

WATER LEVEL DATA*	WELL DATA	PURGE VOLUME CALCULATION
Well Depth / Length of Casing*	Casing Diameter (in.) NA	Calculated Borehole Volume (BV) = _____ Is L ₁ >L ₂ ? Yes _____ No _____
Initial SWL*	Borehole Diameter (in.) NA	Yes: BV = L ₁ _____ x V ₁ _____ + L ₂ _____ x V ₂ _____ = _____ gals.
Length of Water Column (L ₁)	Casing Volume Factor (V ₁)** Annular Volume Factor (V ₂) NA	No: BV = L ₁ _____ x V ₁ _____ + V ₂ _____
Sample Depth / Pump Intake*	Length of Water Column (ft.) = L ₁ NA	Total Purge Volume = BV _____ x no. of borehole volumes _____ = _____ gals.
Purge Rate (approx. gpm)	Length of Filter Pack (ft.) = L ₂	Actual Gals. Purged _____ gals
Well Stick-up (ft)	Porosity of Filter Pack (%)** NA	No. of BV's Purged NA

MICROPURGE

Time	Cumulative Gallons Purged	Temperature °/F	Conductivity mS/cm	pH	Dissolved Oxygen	Redox/ORP (mV)	COMMENTS (i.e.- odor, sediment, color)	Water here
1:05	1	15.78	531	7.44	2.60	242.3	no odor, turb 526	14.91
1:10	2	15.83	641	7.48	1.31	250.7	turb 4.31	14.92
1:15	3	15.82	659	7.50	1.21	257.2	turb 4.91	14.92
1:20	4	15.85	663	7.50	1.12	263.6	turb	

SAMPLE DATA

Sample I.D.	Time Collected	Container Type	Volume	Preservative	# Containers	Analysis Required	COMMENTS

TOC = top of PVC casing * Measured from TOC **see Casing / Annular Volume Factors Table

Kennedy/Jenks Consultants

GROUNDWATER SAMPLING DATA SHEET

Project Name: Wishram	#	Well # MW-1
Field Personnel: Robinson/Sawdey	Date: 11-16-16	Page: 1 Of 1
Purge/Sampling Method: Peristaltic pump		Well Elev. (msl)*:
Water Containment Method: Drum		SWL*:
Field Instrument(s) Used: Geoprobe, YSI, Solinst		SWL Elev. (msl):

WATER LEVEL DATA*	WELL DATA	PURGE VOLUME CALCULATION
Well Depth / Length of Casing*	Casing Diameter (in.) NA	MICROPURGE
Initial SWL*	Borehole Diameter (in.) NA	
Length of Water Column (L ₁)	Casing Volume Factor (V ₁)** Annular Volume Factor (V ₂)** NA	
Sample Depth / Pump Intake*	Length of Water Column (ft.) = L ₁ NA	
Purge Rate (approx. gpm)	Length of Filter Pack (ft.) = L ₂	Calculated Borehole Volume (BV) = Is L ₁ > L ₂ ? Yes ___ No ___ Yes: BV = L ₁ ___ x V ₁ ___ + L ₂ ___ x V ₂ ___ = ___ gals.
Well Stick-up (ft)	Porosity of Filter Pack (%)** NA	Total Purge Volume = BV ___ x no. of borehole volumes ___ = ___ gals.
		Actual Gals. Purged ___ gals
		No. of BV's Purged NA

Time	Cumulative Gallons Purged	Temperature C / F	Conductivity mS/cm	pH	Dissolved Oxygen	Redox/ORP (mV)	COMMENTS (i.e.- odor, sediment, color)
15:16	1	17.58	0.626	7.17	1.12	133.3	turb water level
15:18	2	18.67	0.621	7.03	0.28	24.7	7.80 10.71
15:20	3	18.80	0.622	7.01	0.19	6.0	2.95 10.80
15:25	4	18.67	0.622	6.99	0.22	4.4	1.48 10.52
							1.35 10.82

SAMPLE DATA							
Sample I.D.	Time Collected	Container Type	Volume	Preservative	# Containers	Analysis Required	COMMENTS

TOC = top of PVC casing * Measured from TOC **see Casing / Annular Volume Factors Table

Groundwater Purge and Sample Form

Date: 11/17

Kennedy/Jenks Consultants

PROJECT NAME: BUSF Wislum WELL NUMBER: WMW-3
 PROJECT NUMBER: 1696120 PERSONNEL: Sawley + Robinson
 STATIC WATER LEVEL (FT): 11.02 MEASURING POINT DESCRIPTION: TJC
 WATER LEVEL MEASUREMENT METHOD: Probe PURGE METHOD: Peristaltic
 TIME START PURGE: 1615 PURGE DEPTH (FT) ~16'
 TIME END PURGE: _____
 TIME SAMPLED: 1645
 COMMENTS: _____

WELL VOLUME CALCULATION (FILL IN BEFORE PURGING)	TOTAL DEPTH (FT)	-	DEPTH TO WATER (FT)	=	WATER COLUMN (FT)	X	MULTIPLIER FOR CASING DIAMETER (IN)			=	CASING VOLUME (GAL)
							2	4	6		
	<u>25</u>		<u>11.02</u>		<u>13.98</u>		<u>0.16</u>	<u>0.64</u>	<u>1.44</u>		<u>2.24</u>

TIME	1625	1630	1635	1640	1645		
VOLUME PURGED (GAL)	<u>1.0</u>	<u>1.5</u>	<u>2.0</u>	<u>2.5</u>	<u>3</u>		
PURGE RATE (GPM)	<u>~0.1</u>						
TEMPERATURE (°C)	<u>18.77</u>	<u>18.62</u>	<u>18.28</u>	<u>18.24</u>	<u>18.23</u>		
pH	<u>6.83</u>	<u>6.84</u>	<u>6.86</u>	<u>6.86</u>	<u>6.86</u>		
SPECIFIC CONDUCTIVITY (micromhos) (uncorrected) <small>cm</small>	<u>1556</u>	<u>1548</u>	<u>1534</u>	<u>1518</u>	<u>1520</u>		
DISSOLVED OXYGEN (mg/L)	<u>0.74</u>	<u>0.40</u>	<u>0.35</u>		<u>0.35</u>		
eH(MV)Pt-AgCl ref.	<u>-131.9</u>	<u>-147.7</u>	<u>-145.7</u>	<u>-143.2</u>	<u>-146.2</u>		
TURBIDITY/COLOR	<u>slight stain</u>	<u>clear 6.23</u>	<u>clear 9.49</u>	<u>clear 8.77</u>	<u>clear 9.55</u>		
ODOR	<u>Weak hydro. odor</u>	<u>Weak More odor</u>	<u>Weak odor</u>	<u>Weak odor</u>	<u>Weak odor</u>		
DEPTH OF PURGE INTAKE (FT)	<u>~16'</u>						
DEPTH TO WATER DURING PURGE (FT)	<u>11.22</u>	<u>11.22</u>	<u>11.22</u>	<u>11.22</u>	<u>11.22</u>		
NUMBER OF CASING VOLUMES REMOVED	<u><1</u>	<u><1</u>	<u><1</u>	<u>>1</u>	<u>>1</u>		
DEWATERED?	<u>N</u>	<u>N</u>	<u>N</u>	<u>N</u>	<u>N</u>		

Groundwater Purge and Sample Form

Date: 11/17

Kennedy/Jenks Consultants

PROJECT NAME: BNSF Wishram WELL NUMBER: WMW-5
 PROJECT NUMBER: 1696120 PERSONNEL: Sunday
 STATIC WATER LEVEL (FT): 10.61 MEASURING POINT DESCRIPTION: TVC
 WATER LEVEL MEASUREMENT METHOD: Piobar PURGE METHOD: Peristaltic
 TIME START PURGE: 1130 PURGE DEPTH (FT) ~16'
 TIME END PURGE: 1
 TIME SAMPLED: 1155
 COMMENTS: _____

WELL VOLUME CALCULATION (FILL IN BEFORE PURGING)	TOTAL DEPTH (FT)	-	DEPTH TO WATER (FT)	=	WATER COLUMN (FT)	X	MULTIPLIER FOR CASING DIAMETER (IN)			=	CASING VOLUME (GAL)
							2	4	6		
	<u>25</u>		<u>10.61</u>		<u>14.39</u>		<u>0.16</u>	<u>0.64</u>	<u>1.44</u>		<u>2.30</u>

TIME	1140	1145	1150	1155			
VOLUME PURGED (GAL)	<u>1</u>	<u>1.5</u>	<u>2.0</u>	<u>2.5</u>			
PURGE RATE (GPM)	<u>0.1</u>	—————→					
TEMPERATURE (°C)	<u>16.46</u>	<u>16.46</u>	<u>16.60</u>	<u>16.61</u>			
pH	<u>7.25</u>	<u>9.04</u>	<u>8.15</u>	<u>8.17</u>			
SPECIFIC CONDUCTIVITY (micromhos) (uncorrected) cm	<u>233</u>	<u>251</u>	<u>269</u>	<u>272</u>			
DISSOLVED OXYGEN (mg/L)	<u>4.20</u>	<u>3.90</u>	<u>3.77</u>	<u>3.71</u>			
eH(MV)Pt-AgCl ref.	<u>152.6</u>	<u>145.1</u>	<u>136.7</u>	<u>133.6</u>			
TURBIDITY/COLOR	<u>(Red) 12.53</u>	<u>(Clear) 9.01</u>	<u>(Clear) 3.86</u>	<u>(Clear) 7.06</u>			
ODOR	<u>None</u>	<u>None</u>	<u>None</u>	<u>None</u>			
DEPTH OF PURGE INTAKE (FT)	<u>~16</u>	—————→					
DEPTH TO WATER DURING PURGE (FT)	<u>10.65</u>	<u>10.66</u>	<u>10.66</u>	<u>10.66</u>			
NUMBER OF CASING VOLUMES REMOVED	<u><1</u>	<u><1</u>	<u><1</u>	<u>>1</u>			
DEWATERED?	<u>N</u>	<u>N</u>	<u>N</u>	<u>N</u>			

Groundwater Purge and Sample Form

Date: 11-17-16

Kennedy/Jenks Consultants

PROJECT NAME: _____ WELL NUMBER: WML-7

PROJECT NUMBER: _____ PERSONNEL: _____

STATIC WATER LEVEL (FT): _____ MEASURING POINT DESCRIPTION: _____

WATER LEVEL MEASUREMENT METHOD: _____ PURGE METHOD: _____

TIME START PURGE: 13:15 PURGE DEPTH (FT) _____

TIME END PURGE: _____

TIME SAMPLED: _____

COMMENTS: _____

WELL VOLUME CALCULATION (FILL IN BEFORE PURGING)	TOTAL DEPTH (FT)	-	DEPTH TO WATER (FT)	=	WATER COLUMN (FT)	X	MULTIPLIER FOR CASING DIAMETER (IN)			=	CASING VOLUME (GAL)
							2	4	6		
							0.16	0.64	1.44		

TIME	13:20	13:25	13:30	13:35			
VOLUME PURGED (GAL)	1	2	3	4			
PURGE RATE (GPM) $\frac{mL}{min}$	200	200	200	200			
TEMPERATURE (°C)	17.86	17.93	17.99	18.02			
pH	7.29	7.17	7.13	7.12			
SPECIFIC CONDUCTIVITY (micromhos) (uncorrected) $\frac{cm}{cm}$	0.661	0.669	0.677	0.677			
DISSOLVED OXYGEN (mg/L)	0.50	0.63	0.57	0.46			
eH(MV)Pt-AgCl ref.	189.5	181.0	166.8	154.5			
TURBIDITY/COLOR	4.15	2.96	2.71	2.23			
ODOR	strong HC sulf	→					
DEPTH OF PURGE INTAKE (FT)	15'	15'	15'	15'			
DEPTH TO WATER DURING PURGE (FT)	12.36	12.36	12.36	12.36			
NUMBER OF CASING VOLUMES REMOVED							
DEWATERED?							

Groundwater Purge and Sample Form

Date: 11/16

Kennedy/Jenks Consultants

PROJECT NAME: BVSE Wisham WELL NUMBER: WMW-9
 PROJECT NUMBER: 1696120 PERSONNEL: Sawdon
 STATIC WATER LEVEL (FT): 11.23 MEASURING POINT DESCRIPTION: TUC
 WATER LEVEL MEASUREMENT METHOD: Pipe PURGE METHOD: Perforator
 TIME START PURGE: 15:40 PURGE DEPTH (FT) ~16'
 TIME END PURGE: _____
 TIME SAMPLED: 16:05
 COMMENTS: _____

WELL VOLUME CALCULATION (FILL IN BEFORE PURGING)	TOTAL DEPTH (FT)	-	DEPTH TO WATER (FT)	=	WATER COLUMN (FT)	X	MULTIPLIER FOR CASING DIAMETER (IN)			=	CASING VOLUME (GAL)
							2	4	6		
	<u>28.5</u>	-	<u>11.23</u>	=	<u>11.27</u>	X	<u>0.16</u>	<u>0.64</u>	<u>1.44</u>	=	<u>1.26</u>

TIME	15:50	15:55	16:00	16:05		
VOLUME PURGED (GAL)	<u>1.0</u>	<u>1.5</u>	<u>2</u>	<u>2.5</u>		<u>RIVER @ 16:30</u>
PURGE RATE (GPM)	<u>~0.1</u>	→				
TEMPERATURE (°C)	<u>17.47</u>	<u>17.53</u>	<u>17.58</u>	<u>17.57</u>		<u>13.10</u>
pH	<u>7.17</u>	<u>7.17</u>	<u>7.17</u>	<u>7.17</u>		<u>8.59</u>
SPECIFIC CONDUCTIVITY (uncorrected) ^{µS/cm} (micromhos/cm)	<u>1093</u>	<u>1095</u>	<u>1095</u>	<u>1095</u>		<u>244</u>
DISSOLVED OXYGEN (mg/L)	<u>0.59</u>	<u>0.47</u>	<u>0.38</u>	<u>0.35</u>		<u>9.30</u>
eH(MV)PT-AgCl ref.	<u>177.6</u>	<u>174.4</u>	<u>173.9</u>	<u>173.2</u>		<u>137.3</u>
TURBIDITY/COLOR	<u>Clear 11.26</u>	<u>Clear 7.58</u>	<u>Clear 6.62</u>	<u>Clear 6.67</u>		<u>NA</u>
ODOR	<u>None</u>	<u>None</u>	<u>None</u>	<u>None</u>		↓
DEPTH OF PURGE INTAKE (FT)	<u>~16</u>	<u>~16</u>	<u>~16</u>	<u>~16</u>		
DEPTH TO WATER DURING PURGE (FT)	<u>11.27</u>	<u>11.27</u>	<u>11.27</u>	<u>11.27</u>		
NUMBER OF CASING VOLUMES REMOVED	<u><1</u>	<u><1</u>	<u>>1</u>	<u>>1</u>		
DEWATERED?	<u>N</u>	<u>N</u>	<u>N</u>	<u>N</u>		↓

Groundwater Purge and Sample Form

Date: 11/16

Kennedy/Jenks Consultants

PROJECT NAME: BUSF Wishram WELL NUMBER: WMW-9¹⁰
 PROJECT NUMBER: 1696120 PERSONNEL: Sandberg
 STATIC WATER LEVEL (FT): 11.05 MEASURING POINT DESCRIPTION: TUC
 WATER LEVEL MEASUREMENT METHOD: Probe PURGE METHOD: Peristaltic
 TIME START PURGE: 1440 PURGE DEPTH (FT) ~16'
 TIME END PURGE: _____
 TIME SAMPLED: 1505
 COMMENTS: WMW-9 (20161116)

WELL VOLUME CALCULATION (FILL IN BEFORE PURGING)	TOTAL DEPTH (FT)	DEPTH TO WATER (FT)	WATER COLUMN (FT)	X	MULTIPLIER FOR CASING DIAMETER (IN)			CASING VOLUME (GAL)
					2	4	6	
	<u>22.5</u>	<u>11.05</u>	<u>11.45</u>	<u>1</u>	<u>0.16</u>	<u>0.64</u>	<u>1.44</u>	<u>1.83</u>

TIME	1450	1455	1500	1505			
VOLUME PURGED (GAL)	<u>1</u>	<u>1.5</u>	<u>2</u>	<u>2.5</u>			
PURGE RATE (GPM)	<u>~0.1</u>						
TEMPERATURE (°C)	<u>16.80</u>	<u>16.78</u>	<u>16.82</u>	<u>16.76</u>			
pH	<u>7.37</u>	<u>7.38</u>	<u>7.38</u>	<u>7.38</u>			
SPECIFIC CONDUCTIVITY (uncorrected) ^{µS/cm} (micromhos/cm)	<u>856</u>	<u>880</u>	<u>885</u>	<u>887</u>			
DISSOLVED OXYGEN (mg/L)	<u>1.23</u>	<u>1.04</u>	<u>1.03</u>	<u>1.00</u>			
EH(MV)Pt-AgCl ref. <u>ORP</u>	<u>154.9</u>	<u>151.9</u>	<u>149.0</u>	<u>146.7</u>			
TURBIDITY/COLOR	<u>Clear</u>	<u>Clear</u> <u>3.17</u>	<u>Clear</u> <u>3.02</u>	<u>Clear</u> <u>2.26</u>			
ODOR	<u>None</u>	<u>None</u>	<u>None</u>	<u>None</u>			
DEPTH OF PURGE INTAKE (FT)	<u>~16'</u>						
DEPTH TO WATER DURING PURGE (FT)	<u>11.12</u>	<u>11.12</u>	<u>11.12</u>				
NUMBER OF CASING VOLUMES REMOVED	<u>< 1</u>	<u>< 1</u>	<u>> 1</u>	<u>> 1</u>			
DEWATERED?	<u>N</u>						

Kennedy/Jenks Consultants

GROUNDWATER SAMPLING DATA SHEET

Project Name: Wishram	#	Well # <u>UMW11</u>
Field Personnel: Robinson/Sawdey	Date: <u>11-16-16</u>	Page: 1 Of 1
Purge/Sampling Method: Peristaltic pump		Well Elev.(msl)*:
Water Containment Method: Drum		SWL*:
Field Instrument(s) Used: Geoprobe, YSI, Solinst		SWL Elev. (msl):

WATER LEVEL DATA*	WELL DATA	PURGE VOLUME CALCULATION
Well Depth / Length of Casing*	Casing Diameter (in.) NA	Calculated Borehole Volume (BV) = _____ Is L ₁ >L ₂ ? Yes ___ No ___
Initial SWL*	Borehole Diameter (in.) NA	Yes: BV = L ₁ _____ x V ₁ _____ + L ₂ _____ x V ₂ _____ = _____ gals.
Length of Water Column (L ₁)	Casing Volume Factor (V ₁)** Annular Volume Factor (V ₂)** NA	No: BV = L ₁ _____ x V ₁ _____ + V ₂ _____ = _____ gals.
Sample Depth / Pump Intake*	Length of Water Column (ft.) = L ₁ NA	Total Purge Volume = BV _____ x no. of borehole volumes _____ = _____ gals.
Purge Rate (approx. gpm)	Length of Filter Pack (ft.) = L ₂	Actual Gals. Purged _____ gals
Well Stick-up (ft)	Porosity of Filter Pack (%)** NA	No. of BV's Purged _____ NA

MICROPURGE

Time	Cumulative Gallons Purged	Temperature C / F	Conductivity mS/cm	pH	Dissolved Oxygen	Redox/ORP (mV)	COMMENTS (i.e.- odor, sediment, color)
<u>13:55</u>	<u>1</u>	<u>17.39</u>	<u>0.930</u>	<u>7.39</u>	<u>1.21</u>	<u>166.2</u>	<u>ml color</u> <u>10.27</u> <u>11.16</u>
<u>14:00</u>	<u>2</u>	<u>17.40</u>	<u>0.932</u>	<u>7.39</u>	<u>0.94</u>	<u>131.4</u>	<u>16.1</u> <u>11.16</u>
<u>14:05</u>	<u>3</u>	<u>17.70</u>	<u>0.929</u>	<u>7.38</u>	<u>1.17</u>	<u>92.8</u>	<u>8.60</u> <u>11.16</u>
<u>14:10</u>	<u>4</u>	<u>17.21</u>	<u>0.932</u>	<u>7.38</u>	<u>0.89</u>	<u>92.6</u>	<u>3.44</u> <u>11.17</u>

SAMPLE DATA

Sample I.D.	Time Collected	Container Type	Volume	Preservative	# Containers	Analysis Required	COMMENTS

TOC = top of PVC casing * Measured from TOC **see Casing / Annular Volume Factors Table

Groundwater Purge and Sample Form

Date: 11-17-16

Kennedy/Jenks Consultants

PROJECT NAME: _____ WELL NUMBER: WMLW-17

PROJECT NUMBER: _____ PERSONNEL: AMR

STATIC WATER LEVEL (FT): _____ MEASURING POINT DESCRIPTION: _____

WATER LEVEL MEASUREMENT METHOD: _____ PURGE METHOD: _____

TIME START PURGE: 3:12 PURGE DEPTH (FT) _____

TIME END PURGE: _____

TIME SAMPLED: 3:35 Inp at 3:54

COMMENTS: _____

11:54 - DUP

WELL VOLUME CALCULATION (FILL IN BEFORE PURGING)	TOTAL DEPTH (FT)	-	DEPTH TO WATER (FT)	=	WATER COLUMN (FT)	X	MULTIPLIER FOR CASING DIAMETER (IN)			=	CASING VOLUME (GAL)
							2	4	6		
							0.16	0.64	1.44		

TIME	3:17	3:22	3:27					
VOLUME PURGED (GAL) <u>L</u>	1	2	3					
PURGE RATE (GPM) <u>ML/min</u>	200	200	200					
TEMPERATURE (°C)	17.42	17.76	17.78					
pH	7.75	7.67	7.65					
SPECIFIC CONDUCTIVITY (uncorrected) <u>MS/cm</u> <u>microhos/cm</u>	0.718	0.719	0.721					
DISSOLVED OXYGEN (mg/L)	1.08	0.73	0.68					
eH(MV)Pt-AgCl ref.	202.8	204.2	205.3					
TURBIDITY/COLOR	4.06	2.61	1.91					
ODOR								
DEPTH OF PURGE INTAKE (FT)	15	15	15					
DEPTH TO WATER DURING PURGE (FT)	11.40	11.35	11.42					
NUMBER OF CASING VOLUMES REMOVED								
DEWATERED?								

Kennedy/Jenks Consultants

GROUNDWATER SAMPLING DATA SHEET

Project Name: Wishram	#	Well # <u>WMW-13</u>
Field Personnel: Robinson/Sawdey	Date: <u>11-16-16</u>	Page: 1 Of 1
Purge/Sampling Method: Peristaltic pump		Well Elev. (msl)*:
Water Containment Method: Drum		SWL*:
Field Instrument(s) Used: Geoprobe, YSI, Solinst		SWL Elev. (msl):

WATER LEVEL DATA*	WELL DATA	PURGE VOLUME CALCULATION
Well Depth / Length of Casing*	Casing Diameter (in.) NA	MICROPURGE
Initial SWL*	Borehole Diameter (in.) NA	
Length of Water Column (L ₁)	Casing Volume Factor (V ₁)** Annular Volume Factor (V ₂) NA	Calculated Borehole Volume (BV) = _____ Is L ₁ > L ₂ ? Yes _____ No _____ Yes: BV = L ₁ _____ x V ₁ _____ + L ₂ _____ x V ₂ _____ = _____ gals.
Sample Depth / Pump Intake*	Length of Water Column (ft.) = L ₁ NA	Total Purge Volume = BV _____ x no. of borehole volumes _____ = _____ gals.
Purge Rate (approx. gpm)	Length of Filter Pack (ft.) = L ₂	Actual Gals. Purged _____ gals
Well Stick-up (ft)	Porosity of Filter Pack (%)** NA	No. of BV's Purged NA

Time	Cumulative Gallons Purged	Temperature C/F	Conductivity mS/cm	pH	Dissolved Oxygen	Redox/ORP (mV)	COMMENTS (i.e. - odor, sediment, color)	
<u>16:40</u>	<u>1</u>	<u>17.30</u>	<u>0.606</u>	<u>7.64</u>	<u>0.70</u>	<u>129.9</u>	<u>16.6</u>	<u>11.85</u>
<u>16:45</u>	<u>2</u>	<u>17.89</u>	<u>0.634</u>	<u>7.65</u>	<u>0.21</u>	<u>127.7</u>	<u>1.87</u>	<u>11.86</u>
<u>16:50</u>	<u>3</u>	<u>17.29</u>	<u>0.644</u>	<u>7.67</u>	<u>0.5</u>	<u>131.7</u>	<u>1.21</u>	<u>11.85</u>
<u>16:55</u>	<u>4</u>	<u>17.17</u>	<u>0.655</u>	<u>7.69</u>	<u>0.47</u>	<u>135.1</u>	<u>1.86</u>	<u>11.85</u>

SAMPLE DATA

Sample I.D.	Time Collected	Container Type	Volume	Preservative	# Containers	Analysis Required	COMMENTS

TOC = top of PVC casing * Measured from TOC **see Casing / Annular Volume Factors Table

Groundwater Purge and Sample Form

Date: 11/16

Kennedy/Jenks Consultants

PROJECT NAME: RWSFWigbrown WELL NUMBER: MW-14
 PROJECT NUMBER: 1696170 PERSONNEL: Sunday
 STATIC WATER LEVEL (FT): 15.31 MEASURING POINT DESCRIPTION: Tox
 WATER LEVEL MEASUREMENT METHOD: Probe PURGE METHOD: Peristaltic
 TIME START PURGE: 1155 PURGE DEPTH (FT) ~20'
 TIME END PURGE: _____
 TIME SAMPLED: 1220
 COMMENTS: -

WELL VOLUME CALCULATION (FILL IN BEFORE PURGING)	TOTAL DEPTH (FT)	-	DEPTH TO WATER (FT)	=	WATER COLUMN (FT)	X	MULTIPLIER FOR CASING DIAMETER (IN)			=	CASING VOLUME (GAL)
							2	4	6		
	<u>27</u>		<u>15.31</u>		<u>11.69</u>		<u>0.16</u>	<u>0.64</u>	<u>1.44</u>		<u>1.87</u>

TIME	1205	1210	1215	1220			
VOLUME PURGED (GAL)	<u>1</u>	<u>1.5</u>	<u>2.0</u>	<u>2.5</u>			
PURGE RATE (GPM)	<u>0.1</u>	<u>0.1</u>	<u>0.1</u>	<u>0.1</u>			
TEMPERATURE (°C)	<u>16.51</u>	<u>16.37</u>	<u>16.35</u>	<u>16.36</u>			
pH	<u>7.83</u>	<u>7.85</u>	<u>7.85</u>	<u>7.85</u>			
SPECIFIC CONDUCTIVITY (uncorrected) ^{µS/cm} (micromhos/cm)	<u>408</u>	<u>406</u>	<u>405</u>	<u>405</u>			
DISSOLVED OXYGEN (mg/L)	<u>0.72</u>	<u>0.67</u>	<u>0.65</u>	<u>0.65</u>			
eH(MV)Pt-AgCl ref. <u>ORP</u>	<u>159.3</u>	<u>155.1</u>	<u>153.4</u>	<u>152.9</u>			
TURBIDITY/COLOR	<u>Clear</u>	<u>clear</u> <u>6.17</u>	<u>clear</u> <u>5.99</u>	<u>clear</u> <u>4.73</u>			
ODOR	<u>None</u>	<u>None</u>	<u>None</u>	<u>None</u>			
DEPTH OF PURGE INTAKE (FT)	<u>~20</u>	<u>~20</u>	<u>~20</u>	<u>~20</u>			
DEPTH TO WATER DURING PURGE (FT)	<u>15.36</u>	<u>15.36</u>	<u>15.36</u>	<u>15.36</u>			
NUMBER OF CASING VOLUMES REMOVED	<u><1</u>	<u><1</u>	<u>>1</u>	<u>>1</u>			
DEWATERED?	<u>No</u>	<u>No</u>	<u>No</u>	<u>No</u>			

Groundwater Purge and Sample Form

Date: _____

Kennedy/Jenks Consultants

PROJECT NAME: _____ WELL NUMBER: WMW-15

PROJECT NUMBER: _____ PERSONNEL: Robinson

STATIC WATER LEVEL (FT): 14.98 MEASURING POINT DESCRIPTION: _____

WATER LEVEL MEASUREMENT METHOD: _____ PURGE METHOD: _____

TIME START PURGE: 11:08 PURGE DEPTH (FT) 20

TIME END PURGE: _____

TIME SAMPLED: _____

COMMENTS: _____

WELL VOLUME CALCULATION (FILL IN BEFORE PURGING)	TOTAL DEPTH (FT)	-	DEPTH TO WATER (FT)	=	WATER COLUMN (FT)	X	MULTIPLIER FOR CASING DIAMETER (IN)			=	CASING VOLUME (GAL)
							2	4	6		
							0.16	0.64	1.44		

TIME	11:13	11:18	11:23	11:28			
VOLUME PURGED (GAL)	1	2	3	4			
PURGE RATE (GPM) ^{1 L} / _{min}	200	200	200	200			
TEMPERATURE (°C)	16.46	16.66	16.68	16.67			
pH	7.41	7.32	7.29	7.28			
SPECIFIC CONDUCTIVITY (uncorrected) ^{MS/cm} _(micromhos/cm)	0.751	0.751	0.750	0.748			
DISSOLVED OXYGEN (mg/L)	0.76	0.47	0.40	0.65			
eH(MV)Pt-AgCl ref.	199.8	168.3	144.8	132.1			
TURBIDITY/COLOR	5.46	9.12	3.96	2.32			
ODOR							
DEPTH OF PURGE INTAKE (FT)							
DEPTH TO WATER DURING PURGE (FT)	15.10	15.10	15.10	15.10			
NUMBER OF CASING VOLUMES REMOVED							
DEWATERED?							

GROUNDWATER SAMPLING DATA SHEET

son/Sawdey	#	Well # WMW16
Sampling Method: Peristaltic pump	Date: 11-16-16	Page: 1 Of 1
Water Containment Method: Drum		Well Elev. (msl)*:
Field Instrument(s) Used: Geoprobe, YSI, Solinst		SWL Elev. (msl):

WATER LEVEL DATA*		WELL DATA		PURGE VOLUME CALCULATION	
Well Depth / Length of Casing*		Casing Diameter (in.)	NA	Calculated Borehole Volume (BV) = _____ Is L ₁ >L ₂ ? Yes _____ No _____	
Initial SWL*		Borehole Diameter (in.)	NA	Yes: BV = L ₁ _____ x V ₁ _____ + L ₂ _____ x V ₂ _____ = _____ gals.	
Length of Water Column (L ₁)		Casing Volume Factor (V ₁)**	NA	BV = L ₁ _____ x V ₁ _____ + V ₂ _____	
Sample Depth / Pump Intake*		Annular Volume Factor (V ₂)**	NA	Total Purge Volume = BV _____ x no. of borehole volumes _____ = _____ gals.	
Purge Rate (approx. gpm)		Length of Water Column (ft.) = L ₂	NA	Actual Gals. Purged _____ gals	
Well Stick-up (ft)		Length of Filter Pack (ft.) = L ₂	NA	No. of BV's Purged _____ NA	
		Porosity of Filter Pack (%)**	NA		

MICROPURGE

Time	Cumulative Gallons Purged	Temperature C / F	Conductivity mS/cm *	pH	Dissolved Oxygen	Redox/ORP (mV)	COMMENTS (i.e.- odor, sediment, color)	
8:40	1	16.39	.522	6.86	2.38	187.5	mild odor	14.90
8:45	2	16.97	.527	6.88	1.87	150.1	clr	14.90
8:50	3	17.47	.532	6.87	0.96	121.6		14.91
8:55	4	17.49	.535	6.87	0.85	117.2		

SAMPLE DATA

Sample I.D.	Time Collected	Container Type	Volume	Preservative	# Containers	Analysis Required	COMMENTS

TOC = top of PVC casing * Measured from TOC **see Casing / Annular Volume Factors Table

GROUNDWATER SAMPLING DATA SHEET

Project Name: Wishram	#	Well # <u>W1W17</u>
Field Personnel: Robinson/Sawdey	Date: <u>11-16-16</u>	Page: 1 Of 1
Purge/Sampling Method: Peristaltic pump		Well Elev. (msl)*:
Water Containment Method: Drum		SWL*: <u>14.55</u>
Field Instrument(s) Used: Geoprobe, YSI, Solinst		SWL Elev. (msl):

WATER LEVEL DATA*		WELL DATA		PURGE VOLUME CALCULATION	
Well Depth / Length of Casing*		Casing Diameter (in.)	NA	Calculated Borehole Volume (BV) = _____ Is L ₁ >L ₂ ? Yes _____ No _____	
Initial SWL*		Borehole Diameter (in.)	NA	Yes: BV = L ₁ _____ x V ₁ _____ + L ₂ _____ x V ₂ _____ = _____ gals.	
Length of Water Column (L ₁)		Casing Volume Factor (V ₁)**	NA	No: BV = L ₁ _____ x V ₁ _____ + V ₂ _____	
		Annular Volume Factor (V ₂)**	NA	= _____ gals.	
Sample Depth / Pump Intake*		Length of Water Column (ft.) = L ₁	NA	Total Purge Volume = BV _____ x no. of borehole volumes _____ = _____ gals.	
Purge Rate (approx. gpm)		Length of Filter Pack (ft.) = L ₂		Actual Gals. Purged _____ gals	
Well Stick-up (ft)		Porosity of Filter Pack (%)**	NA	No. of BV's Purged _____ NA	

MICROPURGE

Time	Cumulative Gallons Purged	Temperature C / F	Conductivity mS/cm	pH	Dissolved Oxygen	Redox/ORP (mV)	COMMENTS (i.e. - odor, sediment, color)	
<u>10:45</u>	<u>1</u>	<u>16.27</u>	<u>0.329</u>	<u>7.39</u>	<u>1.59</u>	<u>240.1</u>	<u>13.0</u>	<u>14.56</u>
<u>11:50</u>	<u>2</u>	<u>16.89</u>	<u>0.315</u>	<u>7.20</u>	<u>0.70</u>	<u>171.1</u>	<u>5.42</u>	<u>14.56</u>
<u>11:55</u>	<u>3</u>	<u>16.99</u>	<u>0.307</u>	<u>7.14</u>	<u>0.65</u>	<u>146.6</u>	<u>3.78</u>	<u>14.56</u>

SAMPLE DATA

Sample I.D.	Time Collected	Container Type	Volume	Preservative	# Containers	Analysis Required	COMMENTS

TOC = top of PVC casing * Measured from TOC **see Casing / Annular Volume Factors Table

Kennedy/Jenks Consultants

GROUNDWATER SAMPLING DATA SHEET

Project Name: Wishram	#	Well # <i>WNW18</i>
Field Personnel: Robinson/Sawdey	Date:	Page: 1 Of 1
Purge/Sampling Method: Peristaltic pump		Well Elev. (msl)*:
Water Containment Method: Drum		SWL*:
Field Instrument(s) Used: Geoprobe, YSI, Solinst		SWL Elev. (msl):

WATER LEVEL DATA*		WELL DATA		PURGE VOLUME CALCULATION	
Well Depth / Length of Casing*		Casing Diameter (in.)	NA	Calculated Borehole Volume (BV) = _____ Is L ₁ > L ₂ ? Yes _____ No _____	
Initial SWL*		Borehole Diameter (in.)	NA	Yes: BV = L ₁ _____ x V ₁ _____ + L ₂ _____ x V ₂ _____ = _____ gals.	
Length of Water Column (L ₁)		Casing Volume Factor (V ₁)**	NA	No: BV = L ₁ _____ x V ₁ _____ + V ₂ _____	
		Annular Volume Factor (V ₂)**	NA	= _____ gals.	
Sample Depth / Pump Intake*		Length of Water Column (ft.) = L ₁	NA	Total Purge Volume = BV _____ x no. of borehole volumes _____ = _____ gals.	
Purge Rate (approx. gpm)		Length of Filter Pack (ft.) = L ₂	NA	Actual Gals. Purged	_____ gals.
Well Stick-up (ft)		Porosity of Filter Pack (%)**	NA	No. of BV's Purged	NA

MICROPURGE

Time	Cumulative Gallons Purged	Temperature °F	Conductivity mS/cm	pH	Dissolved Oxygen	Redox/ORP (mV)	COMMENTS (i.e.- odor, sediment, color)	
15:25	1	16.14	406	7.84	1.45	241.8	6.38	14.85'
15:30	2	16.09	402	7.45	1.29	260.9	5.71	14.86
15:35	3	16.61	401	7.37	1.01	270.1	5.87	14.88
15:40	4	16.64	401	7.35	0.96	274.6	2.87	14.89

SAMPLE DATA

Sample I.D.	Time Collected	Container Type	Volume	Preservative	# Containers	Analysis Required	COMMENTS

TOC = top of PVC casing * Measured from TOC **see Casing / Annular Volume Factors Table

FIELD FORM

Page 1 of 1

WATER TABLE/LNAPL THICKNESS MEASUREMENTS
BNSF WISHRAM

Monitoring Personnel:					
Well	Date / Time	Depth to LNAPL (ft bgs)	Depth to Water (ft bgs)	LNAPL Thickness (ft)	Well Status
RMD-1	11-17-16 8:50	—	14.93	—	
RMD-2	11-16-16 10:15	—	14.65	—	
RMD-3	11-15-16 16:27	—	15.06	—	
RMD-4	11-15-16 12:58	—	14.91	—	
WMW-1	11-16-16 15:03	—	10.92	—	
WMW-3	11-17-16 16:15	—	11.02	—	
WMW-5	11-17-16 11:30	—	10.61	—	
WMW-7	11-17-16 13:06	—	12.28	—	
WMW-8	11-17-16 14:45	11.76	11.80	.04	not sampled
WMW-9	11-16-16 15:40	—	11.23	—	
WMW-10	11-16-16 14:40	—	11.05	—	
WMW-11	11-16-16 13:45	—	10.98	—	
WMW-12	11-17-16 15:05	—	11.35	—	
WMW-13	11-16-16 16:30	—	11.66	—	
WMW-14	11-16-16 11:55	—	15.31	—	
WMW-15	11-17-16 11:08	—	14.98	—	
WMW-16	11-16-16 8:36	—	14.90	—	
WMW-17	11-16-16 11:40	—	14.55	—	
WMW-18	11-15-16 15:17	—	14.85	—	

27 January 2017

Groundwater Purge and Sample Form

Date: 1-27-17

Kennedy/Jenks Consultants

PROJECT NAME: Wishram WELL NUMBER: WMW-14
 PROJECT NUMBER: 1696120*00 PERSONNEL: Robinson
 STATIC WATER LEVEL (FT): 15.11 MEASURING POINT DESCRIPTION: TCO
 WATER LEVEL MEASUREMENT METHOD: Geotech interface probe PURGE METHOD: peristaltic pump
 TIME START PURGE: 4:55 PURGE DEPTH (FT) 20'
 TIME END PURGE: 5:10
 TIME SAMPLED: 5:10
 COMMENTS: _____

WELL VOLUME CALCULATION (FILL IN BEFORE PURGING)	TOTAL DEPTH (FT)	-	DEPTH TO WATER (FT)	-	WATER COLUMN (FT)	X	MULTIPLIER FOR CASING DIAMETER (IN)			CASING VOLUME (GAL)
							2	4	6	
							0.16	0.64	1.44	

TIME	4:55	5:00	5:05	5:10			
VOLUME PURGED (GAL)	1	2	3	4			
PURGE RATE (GPM) $\frac{ml}{min}$	200						
TEMPERATURE (°C)	13.82	14.63	14.81	14.82			
pH	7.73	7.76	7.79	7.79			
SPECIFIC CONDUCTIVITY (micromhos) (uncorrected) $\frac{cm}{cm}$	0.237	0.237	0.235	0.235			
DISSOLVED OXYGEN (mg/L)	1.38	1.11	0.92	0.83			
eH(MV)Pt-AgCl ref. OAP	-18.0	-18.2	-17.3	-16.3			
TURBIDITY/COLOR	1.01	0.81	0.98	0.79			
ODOR	none						
DEPTH OF PURGE INTAKE (FT)	20'						
DEPTH TO WATER DURING PURGE (FT)	15.40	15.40	15.41	15.41			
NUMBER OF CASING VOLUMES REMOVED							
DEWATERED?	no						

Groundwater Purge and Sample Form

Date: 1-27-17

Kennedy/Jenks Consultants

PROJECT NAME: Wishram WELL NUMBER: WMW-15
 PROJECT NUMBER: 1696120*00 PERSONNEL: Robinson
 STATIC WATER LEVEL (FT): 14.96 MEASURING POINT DESCRIPTION: TOC
 WATER LEVEL MEASUREMENT METHOD: Geotech interface probe PURGE METHOD: peristaltic pump
 TIME START PURGE: 3:34 PURGE DEPTH (FT) 20'
 TIME END PURGE: 3:59
 TIME SAMPLED: 4:00
 COMMENTS: DUP

WELL VOLUME CALCULATION (FILL IN BEFORE PURGING)	TOTAL DEPTH (FT)	-	DEPTH TO WATER (FT)	-	WATER COLUMN (FT)	X	MULTIPLIER FOR CASING DIAMETER (IN)			CASING VOLUME (GAL)
							2	4	6	
							0.16	0.64	1.44	

TIME	3:39	3:44	3:49	3:54	3:59		
VOLUME PURGED (GAL)	1	2	3	4	5		
PURGE RATE (GPM) ^{ml} / _{min}	200				→		
TEMPERATURE (°C)	13.95	14.87	15.04	15.05	14.97		
pH	7.21	7.19	7.18	7.17	7.17		
SPECIFIC CONDUCTIVITY (micromhos/cm) (uncorrected)	0.880	0.889	0.894	0.897	0.897		
DISSOLVED OXYGEN (mg/L)	1.95	1.19	0.95	0.79	0.71		
eH(MV)Pt-AgCl ref. ORP	60.6	58.2	54.6	49.4	41.3		
TURBIDITY/COLOR	11.4	4.60	3.24	3.22	2.42		
ODOR	mild	mild			→		
DEPTH OF PURGE INTAKE (FT)	20'				→		
DEPTH TO WATER DURING PURGE (FT)	15.28	15.29	15.29	15.29	15.30		
NUMBER OF CASING VOLUMES REMOVED							
DEWATERED?							

Groundwater Purge and Sample Form

Date: 1-27-17

Kennedy/Jenks Consultants

PROJECT NAME: Wishram WELL NUMBER: WMLW-16
 PROJECT NUMBER: 1696120400 PERSONNEL: Robinson
 STATIC WATER LEVEL (FT): 14.70 MEASURING POINT DESCRIPTION: TOC
 WATER LEVEL MEASUREMENT METHOD: Geotech interface probe PURGE METHOD: peristaltic pump
 TIME START PURGE: 12:56 PURGE DEPTH (FT) 20'
 TIME END PURGE: 13:16
 TIME SAMPLED: 13:20
 COMMENTS: turbidity probe died mid-purge so two measurements are missing

WELL VOLUME CALCULATION (FILL IN BEFORE PURGING)	TOTAL DEPTH (FT)	-	DEPTH TO WATER (FT)	=	WATER COLUMN (FT)	X	MULTIPLIER FOR CASING DIAMETER (IN)			CASING VOLUME (GAL)
							2	4	6	
							0.16	0.64	1.44	

TIME	13:01	13:06	13:11	13:16			
VOLUME PURGED (GAL)	1	2	3	4			
PURGE RATE (GPM)	200			→			
TEMPERATURE (°C)	14.30	15.21	15.41	15.50			
pH	7.01	6.88	6.84	6.82			
SPECIFIC CONDUCTIVITY (micromhos) (uncorrected)	0.501	0.501	0.501	0.500			
DISSOLVED OXYGEN (mg/L)	0.44	0.37	0.38	0.35			
eH(MV)Pt-AgCl ref.	38.6	32.9	10.2	-7.2			
TURBIDITY/COLOR	3.05	NA	NA	1.27			
ODOR	none	none	→				
DEPTH OF PURGE INTAKE (FT)	20'			→			
DEPTH TO WATER DURING PURGE (FT)	14.82	14.83	14.84	14.84			
NUMBER OF CASING VOLUMES REMOVED							
DEWATERED?	NO			→			

Groundwater Purge and Sample Form

Date: 1-27-17

Kennedy/Jenks Consultants

PROJECT NAME: Wishram WELL NUMBER: WMLW-17
 PROJECT NUMBER: 1696120-00 PERSONNEL: Robinson
 STATIC WATER LEVEL (FT): 14.58 MEASURING POINT DESCRIPTION: TOC
 WATER LEVEL MEASUREMENT METHOD: Geotech interface probe PURGE METHOD: peristaltic pump
 TIME START PURGE: 10:56 PURGE DEPTH (FT) 20'
 TIME END PURGE: 11:31
 TIME SAMPLED: 11:30
 COMMENTS: _____

WELL VOLUME CALCULATION (FILL IN BEFORE PURGING)	TOTAL DEPTH (FT)	-	DEPTH TO WATER (FT)	=	WATER COLUMN (FT)	X	MULTIPLIER FOR CASING DIAMETER (IN)			=	CASING VOLUME (GAL)
							2	4	6		
							0.16	0.64	1.44		

TIME	11:01	11:06	11:11	11:16	11:21	11:26	11:31
VOLUME PURGED (GAL)	1	2	3	4	5	6	7
PURGE RATE (GPM) $\frac{mL}{min}$	~200	~200	~200	~200	~200	~200	~200
TEMPERATURE (°C)	13.98	14.35	14.35	14.35	14.48	14.48	14.45
pH	6.93	6.93	6.94	6.94	6.93	6.93	6.93
SPECIFIC CONDUCTIVITY (micromhos) (uncorrected) $\frac{cm}{cm}$	0.639	0.645	0.643	0.637	0.633	0.629	0.622
DISSOLVED OXYGEN (mg/L)	0.78	1.12	0.83	0.71	0.60	0.48	0.44
eH(MV)Pt-AgCl ref. ORP	158.2	146.0	111.0	83.0	62.9	49.2	34.2
TURBIDITY/COLOR	33.3	22	10.60	6.74	5.05	3.02	2.37
ODOR	mild, white particles	→	→	mild or	→	→	→
DEPTH OF PURGE INTAKE (FT)	20'	→	→	→	→	→	→
DEPTH TO WATER DURING PURGE (FT)	14.82	14.82	14.82	14.82	14.82	14.83	14.83
NUMBER OF CASING VOLUMES REMOVED							
DEWATERED?	NO	→	→	→	→	→	→

Groundwater Purge and Sample Form

Date: 1-27-17

Kennedy/Jenks Consultants

PROJECT NAME: Wisham WELL NUMBER: WMLW-18
 PROJECT NUMBER: 1696120*00 PERSONNEL: Robinson

STATIC WATER LEVEL (FT): 14.69' MEASURING POINT DESCRIPTION: TOC
 WATER LEVEL MEASUREMENT METHOD: Geotech interface probe PURGE METHOD: peristaltic pump
 TIME START PURGE: 9:27 PURGE DEPTH (FT) 20'
 TIME END PURGE: 9:48
 TIME SAMPLED: 10:50 9:50
 COMMENTS: _____

WELL VOLUME CALCULATION (FILL IN BEFORE PURGING)	TOTAL DEPTH (FT)	-	DEPTH TO WATER (FT)	=	WATER COLUMN (FT)	X	MULTIPLIER FOR CASING DIAMETER (IN)			=	CASING VOLUME (GAL)
							2	4	6		
							0.16	0.64	1.44		

TIME	9:32	9:37	9:42	9:47			
VOLUME PURGED (GAL)	1	2	3	4			
PURGE RATE (GPM) <i>ml/min</i>	~200	~200	~200	~200			
TEMPERATURE (°C)	12.77	13.77	13.98	13.87			
pH	6.80	7.18	7.29	7.30			
SPECIFIC CONDUCTIVITY (micromhos) (uncorrected) $\frac{\text{cm}}{\text{cm}}$	0.539	0.549	0.548	0.549			
DISSOLVED OXYGEN (mg/L)	0.450	1.47	1.08	1.03			
eH(MV)Pt-AgCl ref. <i>ORP</i>	106.4	113.7	125.9	130.2			
TURBIDITY/COLOR	1.63	0.79	0.42	0.47			
ODOR	none	none	none	none			
DEPTH OF PURGE INTAKE (FT)	20'	20'	20'	20'			
DEPTH TO WATER DURING PURGE (FT)	14.72	14.72	14.72	14.72			
NUMBER OF CASING VOLUMES REMOVED							
DEWATERED?							

17 to 18 April 2017

FIELD FORM

WATER TABLE/LNAPL THICKNESS MEASUREMENTS
BNSF WISHRAM

Monitoring Personnel:					
Well	Date / Time	Depth to LNAPL (ft bgs)	Depth to Water (ft bgs)	LNAPL Thickness (ft)	Well Status
A ✓ OHM-1					
A ✓ OHM-2					
A ✓ OHM-3					
A ✓ OHM-4					
X RMD-1					
X RMD-2					
X RMD-3					
X RMD-4					
A ✓ WMW-1	10:35	-	9.93	-	good
A ✓ WMW-3	10:24	-	10.08	-	good
A ✓ WMW-5	10:39	-	9.74	-	good
- WMW-7					
- WMW-8					
A ✓ WMW-9	10:17	-	10.30	-	good
A ✓ WMW-10	10:20	-	10.44	-	good
A ✓ WMW-11	10:30	-	10.39	-	good
- WMW-12					
A ✓ WMW-13	10:14	-	10.81	-	good
A ✓ WMW-14					
X WMW-15					
X WMW-16					
X WMW-17					
X WMW-18					
Additional Notes:					

FIELD FORM

WATER TABLE/LNAPL THICKNESS MEASUREMENTS
BNSF WISHRAM

Monitoring Personnel: <i>AML/AR</i>					
Well	Date / Time	Depth to LNAPL (ft bgs)	Depth to Water (ft bgs)	LNAPL Thickness (ft)	Well Status
OHM-1					
OHM-2					
OHM-3					
OHM-4					
RMD-1	<i>1015</i>	<i>—</i>	<i>14.58</i>	<i>—</i>	<i>Good</i>
RMD-2	<i>1020</i>	<i>—</i>	<i>14.28</i>	<i>—</i>	<i>Good</i>
RMD-3	<i>1023</i>	<i>—</i>	<i>14.53</i>	<i>—</i>	<i>Good</i>
RMD-4	<i>1027</i>	<i>—</i>	<i>14.42</i>	<i>—</i>	<i>Good</i>
WMW-1					
WMW-3					
WMW-5					
WMW-7	<i>1000</i>	<i>—</i>	<i>10.91</i>	<i>—</i>	<i>Good</i>
WMW-8	<i>1005</i>	<i>—</i>	<i>10.45</i>	<i>—</i>	<i>Good</i>
WMW-9					
WMW-10					
WMW-11					
WMW-12	<i>10:00</i>	<i>—</i>	<i>10.13</i>	<i>—</i>	<i>good</i>
WMW-13					
WMW-14	<i>1012</i>	<i>—</i>	<i>14.74</i>	<i>—</i>	<i>good</i>
WMW-15	<i>1014</i>	<i>—</i>	<i>14.60</i>	<i>—</i>	<i>good</i>
WMW-16	<i>1017</i>	<i>—</i>	<i>14.36</i>	<i>—</i>	<i>good</i>
WMW-17	<i>1021</i>	<i>—</i>	<i>14.54</i>	<i>—</i>	<i>good</i>
WMW-18	<i>1025</i>	<i>—</i>	<i>14.41</i>	<i>—</i>	<i>good</i>
Additional Notes:					

Groundwater Purge and Sample Form (Minimal Drawdown)

Kennedy/Jenks Consultants

Date: 4-18-17
 Project Name: BNSF Wishram
 Project Number: 1796120*00
 Sampling Personnel: AMC
 Water Level Meter: Solinst OWI
 Purging Equipment: Peristaltic Pump, Tubing
 Sampling Equipment: Peristaltic Pump, Tubing
 Sampling Time: 1150
 Total Discharge (gal): 2.0
 Water Disposal: On-Site 55-gallon drums

Well Number: RMD-1
 Monument Type: Stickup (ft PVC) Flush: X
 Well Diameter (in): 2
 Well Condition:
 Total Casing Depth (ft): 44.5
 Screened Interval (ft): _____
 Purge Depth (ft): 37.5
 Depth to Groundwater (ft): 14.58
 Depth to LNAPL (ft): _____
 Water Column (ft): _____

Weather: Cloudy

Water Quality Meter(s)	Model	Calibration Date/Time	QA/QC Samples		
Temp/pH/SC/ORP/DO:	YSI 556	<u>4-17</u>	Type	Sample ID	Time
Turbidity:	Micro TPI	<u>4-17</u>			
Other:					

Sample ID	Sample Containers				Field Filtered	Analysis Requested	MS/MSD & Comments
	No.	Type	Pres.	Vol.			
<u>RMD-1-20170418</u>	2	VOA	HCl	40 mL	No	BTEX 8260	
	2	VOA	HCl	40 mL	No	NWTPH-Gx	
	2	VOA	HCl	40 mL	No	NWTPH-Dx w/o SGC	
	2	VOA	--	40 mL	No	PAHs 8270 SIM	
		Amber	--	100 mL	No	OMP Cresols 8270	
	2	VOA	HCl	40 mL	No	Methane RSK 175	
	1	HDPE	H2SO4	125 mL	No	Ammonia	
	1	HDPE	H2SO4	250 mL	No	Nitrate-Nitrite	
	1	HDPE	none	125 mL	No	Sulfate	
	1	HDPE	NaOH/ZnAc	125 mL	No	Sulfide	
1	HDPE	HNO3	250 mL	No	Tot. Metals (Pb)		
1	HDPE	HNO3	250 mL	Yes	Dis. Metals (Pb, Mn, Fe)		
Total		16					

Time	1125	1130	1135	1140	1145			
Start <u>1120</u>								
Parameter (every 5 min)	5 min	5 min	5 min	5 min	5 min	min	min	min
Flow Rate (L/min)	<u>0.1</u>	<u>→</u>	<u>→</u>	<u>→</u>	<u>→</u>			
Volume Purged (Liters)	<u>0.5</u>	<u>1.0</u>	<u>1.5</u>	<u>2.0</u>	<u>2.5</u>			
Water Depth (ft)	<u>14.31</u>	<u>14.32</u>	<u>14.41</u>	<u>14.43</u>	<u>14.44</u>			
Temperature (°C), (± 0.2)	<u>13.82</u>	<u>13.82</u>	<u>14.58</u>	<u>14.69</u>	<u>14.23</u>			
pH, (± 0.1)	<u>7.80</u>	<u>7.80</u>	<u>7.84</u>	<u>7.84</u>	<u>7.83</u>			
Sp. Conductance (uS/cm), (± 3%)	<u>1090</u>	<u>1095</u>	<u>1098</u>	<u>1097</u>	<u>1097</u>			
DO (mg/L), (± 10% or 10% of 0.2mg/l)	<u>32.50</u>	<u>0.65</u>	<u>0.52</u>	<u>0.51</u>	<u>0.46</u>			
ORP (mV), (± 10%)	<u>-69.7</u>	<u>-91.1</u>	<u>-100.9</u>	<u>-101.0</u>	<u>-100.8</u>			
Turbidity (NTU), (± 10% or 3 < 10 NTUs)	<u>32.52</u>	<u>13.82</u>	<u>11.40</u>	<u>9.08</u>	<u>8.59</u>			
Color	<u>Slight Turbid → Clear →</u>							
Odor/Evidence of LNAPL	<u>None →</u>							

Notes: (i.e. actions taken if well dewater, difficulties in sampling through LNAPL, problems during purging/sampling, etc.)

1 US Gallon = 3.8 Liters.

Groundwater Purge and Sample Form (Minimal Drawdown)

Kennedy/Jenks Consultants

Date: 4-18-17
 Project Name: BNSF Wishram
 Project Number: 1796120*00
 Sampling Personnel: AMM
 Water Level Meter: Solinst OWI
 Purging Equipment: Peristaltic Pump, Tubing
 Sampling Equipment: Peristaltic Pump, Tubing
 Sampling Time: 930
 Total Discharge (gal): 1.5
 Water Disposal: On-Site 55-gallon drums

Well Number: RMD-2
 Monument Type: Stickup (ft PVC) Flush: X
 Well Diameter (in): 2
 Well Condition:
 Total Casing Depth (ft): 50.0
 Screened Interval (ft):
 Purge Depth (ft): 40
 Depth to Groundwater (ft): 14.28
 Depth to LNAPL (ft): -
 Water Column (ft):

TOC

Weather:

Water Quality Meter(s)	Model	Calibration Date/Time	QA/QC Samples		
Temp/pH/SC/ORP/DO:	YSI 556	4-2017	Type	Sample ID	Time
Turbidity:	Micro TPI	4-2017	Duplicate	D-2-20170418	--
Other:					

Sample ID	Sample Containers				Field Filtered	Analysis Requested	MS/MSD & Comments
	No.	Type	Pres.	Vol.			
RMD-2-20170418	2	VOA	HCl	40 mL	No	BTEX 8260	
	2	VOA	HCl	40 mL	No	NWTPH-Gx	
	2	VOA	HCl	40 mL	No	NWTPH-Dx w/o SGC	
	2	VOA	--	40 mL	No	PAHs 8270 SIM	
		Amber	--	100 mL	No	OMP Cresols 8270	
	2	VOA	HCl	40 mL	No	Methane RSK 175	
	1	HDPE	H2SO4	125 mL	No	Ammonia	
	1	HDPE	H2SO4	250 mL	No	Nitrate-Nitrite	
	1	HDPE	none	125 mL	No	Sulfate	
	1	HDPE	NaOH/ZnAc	125 mL	No	Sulfide	
1	HDPE	HNO3	250 mL	No	Tot. Metals (Pb)		
1	HDPE	HNO3	250 mL	Yes	Dis. Metals (Pb, Mn, Fe)		

Total 16

Start	Time	910	915	920	925				
Start 905	Time	910	915	920	925				
Parameter (every 5 min)		5 min	5 min	5 min	5 min	min	min	min	min
Flow Rate (L/min)		0.1							
Volume Purged (Liters)		0.5	1.0	1.5	2.0				
Water Depth (ft)		13.71	13.71	13.71	13.71				
Temperature (°C), (± 0.2)		12.65	12.72	12.80	12.93				
pH, (± 0.1)		7.37	7.56	7.61	7.70				
Sp. Conductance (uS/cm), (± 3%)		1326	1334	1334	1334				
DO (mg/L), (± 10% or 10% of 0.2mg/l)		2.07	0.91	0.81	0.65				
ORP (mV), (± 10%)		-99.2	-115.2	-118.5	122.0				
Turbidity (NTU), (± 10% or 3 <10 NTUs)		4.59	0.93	0.88	0.68				
Color		Clr							
Odor/Evidence of LNAPL		No							

Notes: (i.e. actions taken if well dewateres, difficulties in sampling through LNAPL, problems during purging/sampling, etc.)

1 US Gallon = 3.8 Liters.

Groundwater Purge and Sample Form (Minimal Drawdown)

Kennedy/Jenks Consultants

Date: 4-17-17
 Project Name: BNSF Wishram
 Project Number: 1796120*00
 Sampling Personnel: AML
 Water Level Meter: Solinst OWI
 Purging Equipment: Peristaltic Pump, Tubing
 Sampling Equipment: Peristaltic Pump, Tubing
 Sampling Time: 1400
 Total Discharge (gal): 4.5
 Water Disposal: On-Site 55-gallon drums

Well Number: RMD-3
 Monument Type: Stickup (ft PVC) Flush: X
 Well Diameter (in): 2
 Well Condition:
 Total Casing Depth (ft): 60.0
 Screened Interval (ft):
 Purge Depth (ft): 50
 Depth to Groundwater (ft): 17.55
 Depth to LNAPL (ft):
 Water Column (ft):

TOC

Weather:

Water Quality Meter(s)	Model	Calibration Date/Time	QA/QC Samples		
Temp/pH/SC/ORP/DO:	YSI 556	4-17-17	Type	Sample ID	Time
Turbidity:	Micro TPI	4-17-17	—		
Other:					

Sample ID	Sample Containers				Field Filtered	Analysis Requested	MS/MSD & Comments
	No.	Type	Pres.	Vol.			
RMD-3-20170417	2	VOA	HCl	40 mL	No	BTEX 8260	
	2	VOA	HCl	40 mL	No	NWTPH-Gx	✓
	2	VOA	HCl	40 mL	No	NWTPH-Dx w/o SGC	
	2	VOA	--	40 mL	No	PAHs 8270 SIM	
		Amber	--	100 mL	No	OMP Cresols 8270	
	2	VOA	HCl	40 mL	No	Methane RSK 175	
	1	HDPE	H2SO4	125 mL	No	Ammonia	
	1	HDPE	H2SO4	250 mL	No	Nitrate-Nitrite	
	1	HDPE	none	125 mL	No	Sulfate	
	1	HDPE	NaOH/ZnAc	125 mL	No	Sulfide	
1	HDPE	HNO3	250 mL	No	Tot. Metals (Pb)		
1	HDPE	HNO3	250 mL	Yes	Dis. Metals (Pb, Mn, Fe)		

Total 16

Time	1335	1340	1345	1350	1355			
Parameter (every 5 min)	5 min	5 min	5 min	5 min	5 min	min	min	min
Flow Rate (L/min)	0.1	→			→			
Volume Purged (Liters)	0.5	1.0	1.5	2.0	2.5			
Water Depth (ft)	14.53	14.58	14.57	14.57	14.58			
Temperature (°C), (± 0.2)	14.97	14.70	14.67	14.78	14.86			
pH, (± 0.1)	8.51	8.49	8.44	8.37	8.29			
Sp. Conductance (uS/cm), (± 3%)	600	684	701	705	706			
DO (mg/L), (± 10% or 10% of 0.2mg/l)	3.57	1.08	0.73	0.61	0.50			
ORP (mV), (± 10%)	-58.9	-70.4	-105.0	-119.7	-130.0			
Turbidity (NTU), (± 10% or 3 < 10 NTUs)	4.87	4.43	1.97	4.81	0.76			
Color	Ch	→			→			
Odor/Evidence of LNAPL	None	→			→			

Notes: (i.e. actions taken if well dewateres, difficulties in sampling through LNAPL, problems during purging/sampling, etc.)

1 US Gallon = 3.8 Liters.

Groundwater Purge and Sample Form (Minimal Drawdown)

Kennedy/Jenks Consultants

Date: 4-17-17
 Project Name: BNSF Wishram
 Project Number: 1796120*00
 Sampling Personnel: AML
 Water Level Meter: Solinst OWI
 Purging Equipment: Peristaltic Pump, Tubing
 Sampling Equipment: Peristaltic Pump, Tubing
 Sampling Time: 1740
 Total Discharge (gal): ~1.5
 Water Disposal: On-Site 55-gallon drums

Well Number: RMD-4
 Monument Type: Stickup (ft PVC) Flush: X
 Well Diameter (in): 2
 Well Condition:
 Total Casing Depth (ft): 65.0
 Screened Interval (ft): 55
 Purge Depth (ft): 14.42
 Depth to Groundwater (ft): 14.42
 Depth to LNAPL (ft): 14.42
 Water Column (ft): 14.42

TOC

Weather: Cloudy

Water Quality Meter(s)	Model	Calibration Date/Time	QA/QC Samples		
Temp/pH/SC/ORP/DO:	YSI 556	4-17-17	Type	Sample ID	Time
Turbidity:	Micro TPI	4-17-17			
Other:					

Sample ID	Sample Containers				Field Filtered	Analysis Requested	MS/MSD & Comments
	No.	Type	Pres.	Vol.			
RMD-4-20170417	2	VOA	HCl	40 mL	No	BTEX*8260	
	2	VOA	HCl	40 mL	No	NWTPH-Gx	
	2	VOA	HCl	40 mL	No	NWTPH-Dx w/o SGC	
	2	VOA	--	40 mL	No	PAHs 8270 SIM	
		Amber	--	100 mL	No	OMP Cresols 8270	
	2	VOA	HCl	40 mL	No	Methane RSK 175	
	1	HDPE	H2SO4	125 mL	No	Ammonia	
	1	HDPE	H2SO4	250 mL	No	Nitrate-Nitrite	
	1	HDPE	none	125 mL	No	Sulfate	
	1	HDPE	NaOH/ZnAc	125 mL	No	Sulfide	
	1	HDPE	HNO3	250 mL	No	Tot. Metals (Pb)	
1	HDPE	HNO3	250 mL	Yes	Dis. Metals (Pb, Mn, Fe)		

Total 16

Parameter (every 5 min)	Time	1720	1725	1730	1735				
		5 min	5 min	5 min	5 min	min	min	min	min
Flow Rate (L/min)	1715 start	0.1							
Volume Purged (Liters)		0.5	1.0	1.5	2.0				
Water Depth (ft)		14.34	14.35	14.35	14.35				
Temperature (°C), (± 0.2)		14.73	14.54	14.48	14.39				
pH, (± 0.1)		8.02	8.00	7.98	7.93				
Sp. Conductance (uS/cm), (± 3%)		528	527	527	527				
DO (mg/L), (± 10% or 10% of 0.2mg/l)		3.06	3.04	3.04	3.06				
ORP (mV), (± 10%)		59.9	60.0	60.1	60.3				
Turbidity (NTU), (± 10% or 3 <10 NTUs)		7.85	3.56	2.77	1.54				
Color		Clr							
Odor/Evidence of LNAPL		No							

Notes: (i.e. actions taken if well dewater, difficulties in sampling through LNAPL, problems during purging/sampling, etc.)

1 US Gallon = 3.8 Liters.

Groundwater Purge and Sample Form (Minimal Drawdown)

Kennedy/Jenks Consultants

Date: 4-18-17
 Project Name: BNSF Wishram
 Project Number: 1796120*00
 Sampling Personnel: Robinson
 Water Level Meter: Solinst OWI
 Purging Equipment: Peristaltic Pump, Tubing
 Sampling Equipment: Peristaltic Pump, Tubing
 Sampling Time: 12:20
 Total Discharge (gal): ~1.5L
 Water Disposal: On-Site 55-gallon drums

Well Number: WMW-01
 Monument Type: Stickup (ft PVC) Flush: X
 Well Diameter (in): 2
 Well Condition: good
 Total Casing Depth (ft): 20.0
 Screened Interval (ft):
 Purge Depth (ft): 1.5'
 Depth to Groundwater (ft): 9.69'
 Depth to LNAPL (ft):
 Water Column (ft):

TOC

Weather: partly cloudy

Water Quality Meter(s)	Model	Calibration Date/Time	QA/QC Samples		
Temp/pH/SC/ORP/DO:	YSI 556	4-17-17	Type	Sample ID	Time
Turbidity:	Micro TPI	4-17-17			
Other:					

Sample ID	Sample Containers				Field Filtered	Analysis Requested	MS/MSD & Comments	
	No.	Type	Pres.	Vol.				
Total	2	VOA	HCl	40 mL	No	BTEX 8260		
	2	VOA	HCl	40 mL	No	NWTPH-Gx		
	2	VOA	HCl	40 mL	No	NWTPH-Dx w/o SGC		
		VOA	--	40 mL	No	PAHs 8270 SIM		
		Amber	--	100 mL	No	OMP Cresols 8270		
	2	VOA	HCl	40 mL	No	Methane RSK 175		
	1	HDPE	H2SO4	125 mL	No	Ammonia (350.1)		
	1	HDPE	H2SO4	250 mL	No	Nitrate-Nitrite (353.2)		
	1	HDPE	none	125 mL	No	Sulfate (300.0)		
	1	HDPE	NaOH/ZnAc	125 mL	No	Sulfide (376.2)		
	1	HDPE	HNO3	250 mL	No	Tot. Metals (Pb)		
	1	HDPE	HNO3	250 mL	Yes	Dis. Metals (Pb,Mn,Fe)		
	Total		14					

Parameter (every 5 min)	Time	min	min	min	min	min	min	min	min
Flow Rate (L/min)	11:51	~.2	~.2	~.2	~.2	~.2	~.2		
Volume Purged (Liters)	11:56	.2	.4	.6	.8	1	1.2		
Water Depth (ft)	12:01	9.80	9.80	9.81	9.81	9.81	9.81		
Temperature (°C), (± 0.2)	12:06	15.84	15.79	16.08	15.99	15.92	16.01		
pH, (± 0.1)	12:11	6.85	6.84	6.83	6.81	6.80	6.81		
Sp. Conductance (uS/cm), (± 3%)	12:16	970	970	969	969	969	967		
DO (mg/L), (± 10% or 10% of 0.2mg/l)		0.56	0.45	0.22	0.16	0.12	0.11		
ORP (mV), (± 10%)		218.1	203.2	180.1	158.6	139.2	113.4		
Turbidity (NTU), (± 10% or 3 < 10 NTUs)		16.71	16.80	12.10	7.67	8.15	4.41		
Color		rust colored particles				clear			
Odor/Evidence of LNAPL		mild				mild			

Notes: (i.e. actions taken if well dewater, difficulties in sampling through LNAPL, problems during purging/sampling, etc.)

1 US Gallon = 3.8 Liters.

Groundwater Purge and Sample Form (Minimal Drawdown)

Kennedy/Jenks Consultants

Date: 4-18-17
 Project Name: BNSF Wishram
 Project Number: 1796120*00
 Sampling Personnel: Robinson
 Water Level Meter: Solinst OWI
 Purging Equipment: Peristaltic Pump, Tubing
 Sampling Equipment: Peristaltic Pump, Tubing
 Sampling Time: 10:15
 Total Discharge (gal): ~1.8
 Water Disposal: On-Site 55-gallon drums
 Weather: cloudy/light rain

Well Number: WMW-03
 Monument Type: Stickup (ft PVC) Flush: X
 Well Diameter (in): 2
 Well Condition: good
 Total Casing Depth (ft): 20.0
 Screened Interval (ft):
 Purge Depth (ft): 15
 Depth to Groundwater (ft): 10.04
 Depth to LNAPL (ft):
 Water Column (ft):

TOC

Water Quality Meter(s)	Model	Calibration Date/Time	QA/QC Samples		
Temp/pH/SC/ORP/DO:	YSI 556	4/17/17	Type	Sample ID	Time
Turbidity:	Micro TPI	4/17/17			
Other:					

Sample ID	Sample Containers				Field Filtered	Analysis Requested	MS/MSD & Comments
	No.	Type	Pres.	Vol.			
	2	VOA	HCl	40 mL	No	BTEX 8260	
	2	VOA	HCl	40 mL	No	NWTPH-Gx	
	2	VOA	HCl	40 mL	No	NWTPH-Dx w/o SGC	
		VOA	--	40 mL	No	PAHs 8270 SIM	
		Amber	--	100 mL	No	OMP Cresols 8270	
	2	VOA	HCl	40 mL	No	Methane RSK 175	
	1	HDPE	H2SO4	125 mL	No	Ammonia (350.1)	
	1	HDPE	H2SO4	250 mL	No	Nitrate-Nitrite (353.2)	
	1	HDPE	none	125 mL	No	Sulfate (300.0)	
	1	HDPE	NaOH/ZnAc	125 mL	No	Sulfide (376.2)	
	1	HDPE	HNO3	250 mL	No	Tot. Metals (Pb)	
	1	HDPE	HNO3	250 mL	Yes	Dis. Metals (Pb, Mn, Fe)	
Total	14						

	Time	9:38	9:43	9:48	9:53	9:58	10:03	10:08	10:13
Parameter (every 5 min)	min	min	min	min	min	min	min	min	min
Flow Rate (L/min)		~.2	~.2	~.2	~.2	~.2	~.2	~.2	~.2
Volume Purged (Liters)		.2	.4	.6	.8	1.0	1.2	1.4	1.6
Water Depth (ft)		10.15	10.16	10.16	10.16	10.16	10.16	10.16	10.16
Temperature (°C), (± 0.2)		15.63	16.14	16.31	16.35	16.23	16.29	16.34	16.32
pH, (± 0.1)		6.98	7.03	7.06	7.06	7.06	7.06	7.06	7.06
Sp. Conductance (uS/cm), (± 3%)		1606	1609	1613	1615	1617	1617	1617	1617
DO (mg/L), (± 10% or 10% of 0.2mg/l)		0.90	0.52	0.33	0.28	0.28	0.27	0.19	0.22
ORP (mV), (± 10%)		409.0	374.4	344.4	330.6	314.0	304.3	289.9	280.3
Turbidity (NTU), (± 10% or 3 < 10 NTUs)		31.36	35.57	20.25	42.81	16.25	11.30	9.37	7.70
Color		small particles	→	→	→	→	→	→	→
Odor/Evidence of LNAPL		mild	→	→	→	→	→	→	→

Notes: (i.e. actions taken if well dewateres, difficulties in sampling through LNAPL, problems during purging/sampling, etc.)

1 US Gallon = 3.8 Liters.

Groundwater Purge and Sample Form (Minimal Drawdown)

Kennedy/Jenks Consultants

Date: 4-18-17
 Project Name: BNSF Wishram
 Project Number: 1796120*00
 Sampling Personnel: AML
 Water Level Meter: Solinst OWI
 Purging Equipment: Peristaltic Pump, Tubing
 Sampling Equipment: Peristaltic Pump, Tubing
 Sampling Time: 1435
 Total Discharge (gal): 1.5
 Water Disposal: On-Site 55-gallon drums

Well Number: WMW-05
 Monument Type: Stickup (ft PVC) Flush: X
 Well Diameter (in): 2
 Well Condition: Good
 Total Casing Depth (ft): 25.0
 Screened Interval (ft):
 Purge Depth (ft): 20.0
 Depth to Groundwater (ft): 9.74
 Depth to LNAPL (ft):
 Water Column (ft):

Weather: Partly Sunny

Water Quality Meter(s)	Model	Calibration Date/Time	QA/QC Samples		
Temp/pH/SC/ORP/DO:	YSI 556	4-17	Type	Sample ID	Time
Turbidity:	Micro TPI	4-17			
Other:					

Sample ID	Sample Containers				Field Filtered	Analysis Requested	MS/MSD & Comments	
	No.	Type	Pres.	Vol.				
WMW-05-20170418	2	VOA	HCl	40 mL	No	BTEX 8260		
	2	VOA	HCl	40 mL	No	NWTPH-Gx		
	2	VOA	HCl	40 mL	No	NWTPH-Dx w/o SGC		
		VOA	--	40 mL	No	PAHs 8270 SIM		
		Amber	--	100 mL	No	OMP Cresols 8270		
	2	VOA	HCl	40 mL	No	Methane RSK 175		
	1	HDPE	H2SO4	125 mL	No	Ammonia (350.1)		
	1	HDPE	H2SO4	250 mL	No	Nitrate-Nitrite (353.2)		
	1	HDPE	none	125 mL	No	Sulfate (300.0)		
	1	HDPE	NaOH/ZnAc	125 mL	No	Sulfide (376.2)		
	1	HDPE	HNO3	250 mL	No	Tot. Metals (Pb)		
	1	HDPE	HNO3	250 mL	Yes	Dis.Metals (Pb,Mn,Fe)		
	Total		14					

Parameter (every 5 min)	Time	1415	1420	1425	1430				
Flow Rate (L/min)	5 min	0.1	0.5	1.0	1.5	2.0			
Volume Purged (Liters)		0.5	1.0	1.5	2.0				
Water Depth (ft)		9.65	9.66	9.66	9.65				
Temperature (°C), (± 0.2)		15.86	15.50	15.97	16.07				
pH, (± 0.1)		8.95	8.88	8.83	8.74				
Sp. Conductance (uS/cm), (± 3%)		540	539	539	539				
DO (mg/L), (± 10% or 10% of 0.2mg/l)		2.18	1.68	0.99	0.93				
ORP (mV), (± 10%)		74.9	64.1	41.6	38.6				
Turbidity (NTU), (± 10% or 3 < 10 NTUs)		4.28	3.40	3.49	3.48				
Color		Clear	Clear						
Odor/Evidence of LNAPL		None	None						

Notes: (i.e. actions taken if well dewatered, difficulties in sampling through LNAPL, problems during purging/sampling, etc.)
 1 US Gallon = 3.8 Liters.

Groundwater Purge and Sample Form (Minimal Drawdown)

Kennedy/Jenks Consultants

Date: 4-17-17
 Project Name: BNSF Wishram
 Project Number: 1796120*00
 Sampling Personnel: Robinson
 Water Level Meter: Solinst OWI
 Purging Equipment: Peristaltic Pump, Tubing
 Sampling Equipment: Peristaltic Pump, Tubing
 Sampling Time: _____
 Total Discharge (gal): _____
 Water Disposal: On-Site 55-gallon drums

Well Number: WMW-07
 Monument Type: Stickup: _____ (ft PVC) Flush: X
 Well Diameter (in): 2
 Well Condition: _____
 Total Casing Depth (ft): 20.0
 Screened Interval (ft): _____
 Purge Depth (ft): _____
 Depth to Groundwater (ft): _____
 Depth to LNAPL (ft): _____
 Water Column (ft): _____

Weather: _____

Water Quality Meter(s)	Model	Calibration Date/Time	QA/QC Samples		
Temp/pH/SC/ORP/DO:	YSI 556		Type	Sample ID	Time
Turbidity:	Micro TPI				
Other:					

Sample ID	Sample Containers				Field Filtered	Analysis Requested	MS/MSD & Comments
	No.	Type	Pres.	Vol.			
	2	VOA	HCl	40 mL	No	BTEX 8260	
	2	VOA	HCl	40 mL	No	NWTPH-Gx	
	2	VOA	HCl	40 mL	No	NWTPH-Dx w/o SGC	
		VOA	--	40 mL	No	PAHs 8270 SIM	
		Amber	--	100 mL	No	OMP Cresols 8270	
	2	VOA	HCl	40 mL	No	Methane RSK 175	
	1	HDPE	H2SO4	125 mL	No	Ammonia (350.1)	
	1	HDPE	H2SO4	250 mL	No	Nitrate-Nitrite (353.2)	
	1	HDPE	none	125 mL	No	Sulfate (300.0)	
	1	HDPE	NaOH/ZnAc	125 mL	No	Sulfide (376.2)	
	1	HDPE	HNO3	250 mL	No	Tot. Metals (Pb)	
	1	HDPE	HNO3	250 mL	Yes	Dis. Metals (Pb,Mn,Fe)	
Total		14					

Parameter (every 5 min)	min	min	min	min	min	min	min
Flow Rate (L/min)							
Volume Purged (Liters)							
Water Depth (ft)							
Temperature (°C), (± 0.2)							
pH, (± 0.1)							
Sp. Conductance (uS/cm),(± 3%)							
DO (mg/L), (± 10% or 10% of 0.2mg/l)							
ORP (mV), (± 10%)							
Turbidity (NTU), (± 10% or 3 <10 NTUs)							
Color							
Odor/Evidence of LNAPL							

*Net sample lead -
Screen in well*

Notes: (i.e. actions taken if well dewater, difficulties in sampling through LNAPL, problems during purging/sampling, etc.)

1 US Gallon = 3.8 Liters.

Groundwater Purge and Sample Form (Minimal Drawdown)

Kennedy/Jenks Consultants

Date: 4-17-17
 Project Name: BNSF Wishram
 Project Number: 1796120*00
 Sampling Personnel: Robinson
 Water Level Meter: Solinst OWI
 Purging Equipment: Peristaltic Pump, Tubing
 Sampling Equipment: Peristaltic Pump, Tubing
 Sampling Time: _____
 Total Discharge (gal): _____
 Water Disposal: On-Site 55-gallon drums

Well Number: WMW-08
 Monument Type: Stickup (ft PVC) Flush: X
 Well Diameter (in): 2
 Well Condition: _____
 Total Casing Depth (ft): 25.0
 Screened Interval (ft): _____
 Purge Depth (ft): _____
 Depth to Groundwater (ft): _____
 Depth to LNAPL (ft): _____
 Water Column (ft): _____

TOC

Weather: _____

Water Quality Meter(s)	Model	Calibration Date/Time	QA/QC Samples		
Temp/pH/SC/ORP/DO:	YSI 556		Type	Sample ID	Time
Turbidity:	Micro TPI				
Other:					

Sample ID	Sample Containers				Field Filtered	Analysis Requested	MS/MSD & Comments
	No.	Type	Pres.	Vol.			
	2	VOA	HCl	40 mL	No	BTEX 8260	
	2	VOA	HCl	40 mL	No	NWTPH-Gx	
	2	VOA	HCl	40 mL	No	NWTPH-Dx w/o SGC	
		VOA	--	40 mL	No	PAHs 8270 SIM	
		Amber	--	100 mL	No	OMP Cresols 8270	
	2	VOA	HCl	40 mL	No	Methane RSK 175	
	1	HDPE	H2SO4	125 mL	No	Ammonia (350.1)	
	1	HDPE	H2SO4	250 mL	No	Nitrate-Nitrite (353.2)	
	1	HDPE	none	125 mL	No	Sulfate (300.0)	
	1	HDPE	NaOH/ZnAc	125 mL	No	Sulfide (376.2)	
	1	HDPE	HNO3	250 mL	No	Tot. Metals (Pb)	
	1	HDPE	HNO3	250 mL	Yes	Dis. Metals (Pb, Mn, Fe)	
Total	14						

Parameter (every 5 min)	Time							
	min	min	min	min	min	min	min	min
Flow Rate (L/min)								
Volume Purged (Liters)								
Water Depth (ft)								
Temperature (°C), (± 0.2)								
pH, (± 0.1)								
Sp. Conductance (uS/cm), (± 3%)								
DO (mg/L), (± 10% or 10% of 0.2mg/l)								
ORP (mV), (± 10%)								
Turbidity (NTU), (± 10% or 3 < 10 NTUs)								
Color								
Odor/Evidence of LNAPL								

*Not sampled -
Screen in well*

Notes: (i.e. actions taken if well dewater, difficulties in sampling through LNAPL, problems during purging/sampling, etc.)

1 US Gallon = 3.8 Liters.

Groundwater Purge and Sample Form (Minimal Drawdown)

Kennedy/Jenks Consultants

Date: 4-17-17
 Project Name: BNSF Wishram
 Project Number: 1796120*00
 Sampling Personnel: Robinson
 Water Level Meter: Solinst OWI
 Purging Equipment: Peristaltic Pump, Tubing
 Sampling Equipment: Peristaltic Pump, Tubing
 Sampling Time: 14:35
 Total Discharge (gal): .8
 Water Disposal: On-Site 55-gallon drums

Well Number: WMW-09
 Monument Type: Stickup (ft PVC) Flush: X
 Well Diameter (in): 2
 Well Condition: good
 Total Casing Depth (ft): 25.0
 Screened Interval (ft):
 Purge Depth (ft): 15
 Depth to Groundwater (ft): 10.33
 Depth to LNAPL (ft):
 Water Column (ft):

TOC

Weather: partly cloudy

Water Quality Meter(s)	Model	Calibration Date/Time	QA/QC Samples		
Temp/pH/SC/ORP/DO:	YSI 556	4-17-17	Type	Sample ID	Time
Turbidity:	Micro TPI	4-17-17			
Other:					

Sample ID	Sample Containers				Field Filtered	Analysis Requested	MS/MSD & Comments
	No.	Type	Pres.	Vol.			
	2	VOA	HCl	40 mL	No	BTEX 8260	
	2	VOA	HCl	40 mL	No	NWTPH-Gx	
	2	VOA	HCl	40 mL	No	NWTPH-Dx w/o SGC	
		VOA	--	40 mL	No	PAHs 8270 SIM	
		Amber	--	100 mL	No	OMP Cresols 8270	
	2	VOA	HCl	40 mL	No	Methane RSK 175	
	1	HDPE	H2SO4	125 mL	No	Ammonia (350.1)	
	1	HDPE	H2SO4	250 mL	No	Nitrate-Nitrite (353.2)	
	1	HDPE	none	125 mL	No	Sulfate (300.0)	
	1	HDPE	NaOH/ZnAc	125 mL	No	Sulfide (376.2)	
	1	HDPE	HNO3	250 mL	No	Tot. Metals (Pb)	
	1	HDPE	HNO3	250 mL	Yes	Dis. Metals (Pb, Mn, Fe)	

Total 14

Parameter (every 5 min)	Time	min	min	min	min	min	min	min	min
Flow Rate (L/min)	14:18	~.2	~.2	~.2	~.2				
Volume Purged (Liters)		.2	.4	.6	.8				
Water Depth (ft)		10.39	10.40	10.40	10.40				
Temperature (°C), (± 0.2)		14.93	15.08	15.11	15.01				
pH, (± 0.1)		7.12	7.08	7.08	7.07				
Sp. Conductance (uS/cm), (± 3%)		1070	1068	1063	1062				
DO (mg/L), (± 10% or 10% of 0.2mg/l)		0.72	0.41	0.38	0.38				
ORP (mV), (± 10%)		388.8	390.7	391.9	393.2				
Turbidity (NTU), (± 10% or 3 < 10 NTUs)		3.33	3.74	5.32	4.35				
Color		none	none	none	none				
Odor/Evidence of LNAPL		none	none	none	none				

Notes: (i.e. actions taken if well dewater, difficulties in sampling through LNAPL, problems during purging/sampling, etc.)

1 US Gallon = 3.8 Liters.

Groundwater Purge and Sample Form (Minimal Drawdown)

Kennedy/Jenks Consultants

Date: 4-17-17
 Project Name: BNSF Wishram
 Project Number: 1796120*00
 Sampling Personnel: Robin Neer
 Water Level Meter: Solinst OWI
 Purging Equipment: Peristaltic Pump, Tubing
 Sampling Equipment: Peristaltic Pump, Tubing
 Sampling Time: 13:30
 Total Discharge (gal): ~8L
 Water Disposal: On-Site 55-gallon drums

Well Number: WMW-10
 Monument Type: Stickup (ft PVC) Flush: X
 Well Diameter (in): 2
 Well Condition: good
 Total Casing Depth (ft): 25.0
 Screened Interval (ft): _____
 Purge Depth (ft): 151
 Depth to Groundwater (ft): 10.46
 Depth to LNAPL (ft): —
 Water Column (ft): _____

TOC

Weather: partly cloudy

Water Quality Meter(s)	Model	Calibration Date/Time	QA/QC Samples		
Temp/pH/SC/ORP/DO:	YSI 556	4-17-17	Type	Sample ID	Time
Turbidity:	Micro TPI	4-17-17			
Other:					

Sample ID	Sample Containers				Field Filtered	Analysis Requested	MS/MSD & Comments
	No.	Type	Pres.	Vol.			
	2	VOA	HCl	40 mL	No	BTEX 8260	
	2	VOA	HCl	40 mL	No	NWTPH-Gx	
	2	VOA	HCl	40 mL	No	NWTPH-Dx w/o SGC	
		VOA	--	40 mL	No	PAHs 8270 SIM	
		Amber	--	100 mL	No	OMP Cresols 8270	
	2	VOA	HCl	40 mL	No	Methane RSK 175	
	1	HDPE	H2SO4	125 mL	No	Ammonia (350.1)	
	1	HDPE	H2SO4	250 mL	No	Nitrate-Nitrite (353.2)	
	1	HDPE	none	125 mL	No	Sulfate (300.0)	
	1	HDPE	NaOH/ZnAc	125 mL	No	Sulfide (376.2)	
	1	HDPE	HNO3	250 mL	No	Tot. Metals (Pb)	
	1	HDPE	HNO3	250 mL	Yes	Dis. Metals (Pb, Mn, Fe)	

Total 14

Parameter (every 5 min)	Time	min	min	min	min	min	min	min	min
Flow Rate (L/min)	13:15	~.2	~.2	~.2	~.2				
Volume Purged (Liters)		.2	.4	.6	.8				
Water Depth (ft)		10.54	10.55	10.55	10.55				
Temperature (°C), (± 0.2)		14.64	14.57	14.60	14.55				
pH, (± 0.1)		7.31	7.30	7.29	7.30				
Sp. Conductance (uS/cm), (± 3%)		1010	1009	1007	1004				
DO (mg/L), (± 10% or 10% of 0.2mg/l)		1.61	1.44	1.34	1.26				
ORP (mV), (± 10%)		393.8	393.9	394.1	393.9				
Turbidity (NTU), (± 10% or 3 < 10 NTUs)		1.76	0.888	0.50	0.84				
Color		none	none	none	none				
Odor/Evidence of LNAPL		none	none	none	none				

Notes: (i.e. actions taken if well dewateres, difficulties in sampling through LNAPL, problems during purging/sampling, etc.)

1 US Gallon = 3.8 Liters.

Groundwater Purge and Sample Form (Minimal Drawdown)

Kennedy/Jenks Consultants

Date: 4-17-17
 Project Name: BNSF Wishram
 Project Number: 1796120*00

Well Number: WMW-11
 Monument Type: Stickup (ft PVC) 2 Flush: X
 Well Diameter (in): 2

Sampling Personnel: _____
 Water Level Meter: Solinst OWI
 Purging Equipment: Peristaltic Pump, Tubing
 Sampling Equipment: Peristaltic Pump, Tubing

Well Condition: good
 Total Casing Depth (ft): 25.0
 Screened Interval (ft): _____
 Purge Depth (ft): 15'

Sampling Time: 14:55 15:55
 Total Discharge (gal): 1.2

Depth to Groundwater (ft): 10.43
 Depth to LNAPL (ft): _____

Water Disposal: On-Site 55-gallon drums

Water Column (ft): _____

Weather: partly cloudy

TOC

Water Quality Meter(s)	Model	Calibration Date/Time	QA/QC Samples		
Temp/pH/SC/ORP/DO:	YSI 556	4-17-17	Type	Sample ID	Time
Turbidity:	Micro TPI	4-17-17			
Other:					

Sample ID	Sample Containers				Field Filtered	Analysis Requested	MS/MSD & Comments
	No.	Type	Pres.	Vol.			
	2	VOA	HCl	40 mL	No	BTEX 8260	
	2	VOA	HCl	40 mL	No	NWTPH-Gx	
	2	VOA	HCl	40 mL	No	NWTPH-Dx w/o SGC	
		VOA	--	40 mL	No	PAHs 8270 SIM	
		Amber	--	100 mL	No	OMP Cresols 8270	
	2	VOA	HCl	40 mL	No	Methane RSK 175	
	1	HDPE	H2SO4	125 mL	No	Ammonia (350.1)	
	1	HDPE	H2SO4	250 mL	No	Nitrate-Nitrite (353.2)	
	1	HDPE	none	125 mL	No	Sulfate (300.0)	
	1	HDPE	NaOH/ZnAc	125 mL	No	Sulfide (376.2)	
	1	HDPE	HNO3	250 mL	No	Tot. Metals (Pb)	
	1	HDPE	HNO3	250 mL	Yes	Dis. Metals (Pb, Mn, Fe)	
Total	14						

	Time	15:29	15:33	15:38	15:43	15:48	15:53		
Parameter (every 5 min)		min	min	min	min	min	min	min	min
Flow Rate (L/min)		~.2	~.2	~.2	~.2	~.2	~.2		
Volume Purged (Liters)		.2	.4	.6	.8	1	1.2		
Water Depth (ft)		10.59	10.59	10.59	10.59	10.59	10.60		
Temperature (°C), (± 0.2)		14.92	14.94	14.98	15.02	14.95	14.93		
pH, (± 0.1)		7.21	7.19	7.19	7.19	7.18	7.18		
Sp. Conductance (uS/cm), (± 3%)		1590	1592	1592	1593	1593	1593		
DO (mg/L), (± 10% or 10% of 0.2mg/l)		0.63	0.38	0.27	0.21	.16	.17		
ORP (mV), (± 10%)		388.6	389.8	390.0	388.4	385.2	386.7		
Turbidity (NTU), (± 10% or 3 < 10 NTUs)		48.17	15.82	15.16	8.17	5.95	5.37		
Color		most colored particles →			RW particles	dr	clear		
Odor/Evidence of LNAPL		none	none	none	none	none	none		

Notes: (i.e. actions taken if well dewater, difficulties in sampling through LNAPL, problems during purging/sampling, etc.)

1 US Gallon = 3.8 Liters.

Groundwater Purge and Sample Form (Minimal Drawdown)

Kennedy/Jenks Consultants

Date: 4-17-17
 Project Name: BNSF Wishram
 Project Number: 1796120*00
 Sampling Personnel: Robinson
 Water Level Meter: Solinst OWI
 Purging Equipment: Peristaltic Pump, Tubing
 Sampling Equipment: Peristaltic Pump, Tubing
 Sampling Time: 17:15
 Total Discharge (gal): 212
 Water Disposal: On-Site 55-gallon drums

Well Number: WMW-12
 Monument Type: Stickup (ft PVC) Flush: X
 Well Diameter (in): 2
 Well Condition: good
 Total Casing Depth (ft): 25.0
 Screened Interval (ft): _____
 Purge Depth (ft): 15'
 Depth to Groundwater (ft): 10.11
 Depth to LNAPL (ft): _____
 Water Column (ft): _____

TOC

Weather: partly cloudy

Water Quality Meter(s)	Model	Calibration Date/Time	QA/QC Samples		
			Type	Sample ID	Time
Temp/pH/SC/ORP/DO:	YSI 556	4-17-17			
Turbidity:	Micro TPI	4-17-17			
Other: <u>IT-5</u>					

Sample ID	Sample Containers				Field Filtered	Analysis Requested	MS/MSD & Comments
	No.	Type	Pres.	Vol.			
	2	VOA	HCl	40 mL	No	BTEX 8260	
	2	VOA	HCl	40 mL	No	NWTPH-Gx	
	2	VOA	HCl	40 mL	No	NWTPH-Dx w/o SGC	
	2	VOA	--	40 mL	No	PAHs 8270 SIM	
	2	Amber	--	100 mL	No	OMP Cresols 8270	
	2	VOA	HCl	40 mL	No	Methane RSK 175	
	1	HDPE	H2SO4	125 mL	No	Ammonia	
	1	HDPE	H2SO4	250 mL	No	Nitrate-Nitrite	
	1	HDPE	none	125 mL	No	Sulfate	
	1	HDPE	NaOH/ZnAc	125 mL	No	Sulfide	
	1	HDPE	HNO3	250 mL	No	Tot. Metals (Pb)	
	1	HDPE	HNO3	250 mL	Yes	Dis. Metals (Pb, Mn, Fe)	
Total	18						

	Time	16:57	17:02	17:07	17:12				
Parameter (every 5 min)	min	min	min	min	min	min	min	min	min
Flow Rate (L/min)	~.2	~2	~2	~2					
Volume Purged (Liters)	.2	.4	.6	.8					
Water Depth (ft)	10.19	10.20	10.20	10.21					
Temperature (°C), (± 0.2)	14.67	14.66	14.65	14.57					
pH, (± 0.1)	7.61	7.57	7.54	7.52					
Sp. Conductance (uS/cm), (± 3%)	1350	1349	1350	1350					
DO (mg/L), (± 10% or 10% of 0.2mg/l)	2.43	2.23	2.00	1.97					
ORP (mV), (± 10%)	377.6	381.0	384.2	386.9					
Turbidity (NTU), (± 10% or 3 <10 NTUs)	2.64	2.73	3.10	2.69					
Color	clear	clear	clear	clear					
Odor/Evidence of LNAPL	none	none	none	none					

Notes: (i.e. actions taken if well dewateres, difficulties in sampling through LNAPL, problems during purging/sampling, etc.)

1 US Gallon = 3.8 Liters.

Groundwater Purge and Sample Form (Minimal Drawdown)

Kennedy/Jenks Consultants

Date: 4-17-17
 Project Name: BNSF Wishram
 Project Number: 1796120*00
 Sampling Personnel: Reidinger
 Water Level Meter: Solinst OWI
 Purging Equipment: Peristaltic Pump, Tubing
 Sampling Equipment: Peristaltic Pump, Tubing
 Sampling Time: 12:25
 Total Discharge (gal): 1
 Water Disposal: On-Site 55-gallon drums

Well Number: WMW-13
 Monument Type: Stickup (ft PVC) Flush: X
 Well Diameter (in): 2
 Well Condition: good
 Total Casing Depth (ft): 25.0
 Screened Interval (ft): _____
 Purge Depth (ft): 15
 Depth to Groundwater (ft): 10.81
 Depth to LNAPL (ft): _____
 Water Column (ft): _____

TOC

Weather: partly cloudy

Water Quality Meter(s)	Model	Calibration Date/Time	QA/QC Samples		
			Type	Sample ID	Time
Temp/pH/SC/ORP/DO:	YSI 556	4-17-17			
Turbidity:	Micro TPI	4-17-17			
Other:					

Sample ID	Sample Containers				Field Filtered	Analysis Requested	MS/MSD & Comments
	No.	Type	Pres.	Vol.			
	2	VOA	HCl	40 mL	No	BTEX 8260	
	2	VOA	HCl	40 mL	No	NWTPH-Gx	
	2	VOA	HCl	40 mL	No	NWTPH-Dx w/o SGC	
	2	VOA	--	40 mL	No	PAHs 8270 SIM	
	2	Amber	--	100 mL	No	OMP Cresols 8270	
	2	VOA	HCl	40 mL	No	Methane RSK 175	
	1	HDPE	H2SO4	125 mL	No	Ammonia	
	1	HDPE	H2SO4	250 mL	No	Nitrate-Nitrite	
	1	HDPE	none	125 mL	No	Sulfate	
	1	HDPE	NaOH/ZnAc	125 mL	No	Sulfide	
	1	HDPE	HNO3	250 mL	No	Tot. Metals (Pb)	
	1	HDPE	HNO3	250 mL	Yes	Dis. Metals- (Pb, Mn, Fe)	
Total		18					

	Time	12:05	12:10	12:15	12:20	12:25			
Parameter (every 5 min)	min	min	min	min	min	min	min	min	min
Flow Rate (L/min)		~.2	~.2	~.2	~.2	~.2			
Volume Purged (Liters)		.2	.4	.6	~.8	1			
Water Depth (ft)		10.92	10.93	10.93	10.94	10.94			
Temperature (°C), (± 0.2)		15.66	15.52	15.46	15.54	15.54			
pH, (± 0.1)		7.23	7.38	7.43	7.43	7.44			
Sp. Conductance (uS/cm), (± 3%)		1214	1211	1208	1205	1204			
DO (mg/L), (± 10% or 10% of 0.2mg/l)		0.79	0.68	0.58	0.49	0.49			
ORP (mV), (± 10%)		377.9	384.0	388.3	391.5	393.0			
Turbidity (NTU), (± 10% or 3 < 10 NTUs)		3.03	2.10	3.13	2.79	2.35			
Color		none	none	none	none	none			
Odor/Evidence of LNAPL		none	none	none	none	none			

Notes: (i.e. actions taken if well dewatered, difficulties in sampling through LNAPL, problems during purging/sampling, etc.)

1 US Gallon = 3.8 Liters.

Groundwater Purge and Sample Form (Minimal Drawdown)

Kennedy/Jenks Consultants

Date: 4-18-17 Well Number: WMW-14
 Project Name: BNSF Wishram Monument Type: Stickup (ft PVC) Flush: X
 Project Number: 1796120*00 Well Diameter (in): 2
 Sampling Personnel: AML Well Condition: Good
 Water Level Meter: Solinst OWI Total Casing Depth (ft): 30.0
 Purging Equipment: Peristaltic Pump, Tubing Screened Interval (ft): _____
 Sampling Equipment: Peristaltic Pump, Tubing Purge Depth (ft): 20.0
 Sampling Time: 1340 Depth to Groundwater (ft): 14.74
 Total Discharge (gal): 1.5 Depth to LNAPL (ft): -
 Water Disposal: On-Site 55-gallon drums Water Column (ft): -
 Weather: Partly Cloudy

TOC

Water Quality Meter(s)	Model	Calibration Date/Time	QA/QC Samples		
Temp/pH/SC/ORP/DO:	YSI 556	4.2017	Type	Sample ID	Time
Turbidity:	Micro TPI	4.2017			
Other:					

Sample ID	Sample Containers				Field Filtered	Analysis Requested	MS/MSD & Comments
	No.	Type	Pres.	Vol.			
WMW-14-20170418	2	VOA	HCl	40 mL	No	BTEX 8260	
	2	VOA	HCl	40 mL	No	NWTPH-Gx	
	2	VOA	HCl	40 mL	No	NWTPH-Dx w/o SGC	
		VOA	--	40 mL	No	PAHs 8270 SIM	
		Amber	--	100 mL	No	OMP Cresols 8270	
	2	VOA	HCl	40 mL	No	Methane RSK 175	
	1	HDPE	H2SO4	125 mL	No	Ammonia (350.1)	
	1	HDPE	H2SO4	250 mL	No	Nitrate-Nitrite (353.2)	
	1	HDPE	none	125 mL	No	Sulfate (300.0)	
	1	HDPE	NaOH/ZnAc	125 mL	No	Sulfide (376.2)	
	1	HDPE	HNO3	250 mL	No	Tot. Metals (Pb)	
1	HDPE	HNO3	250 mL	Yes	Dis. Metals (Pb, Mn, Fe)		
Total		14					

Parameter (every 5 min)	1315	1320	1325	1330	1335				
	Time	5 min	5 min	5 min	5 min	min	min	min	min
Flow Rate (L/min)		0.1							
Volume Purged (Liters)		0.5	1.0	1.5	2.0				
Water Depth (ft)		14.35	14.36	14.36	15.02				
Temperature (°C), (± 0.2)		14.91	15.01	14.96	14.87				
pH, (± 0.1)		8.74	8.71	8.66	8.64				
Sp. Conductance (uS/cm), (± 3%)		384	384	383	384				
DO (mg/L), (± 10% or 10% of 0.2mg/l)		2.21	2.02	1.95	1.86				
ORP (mV), (± 10%)		40.2	36.7	33.5	30.6				
Turbidity (NTU), (± 10% or 3 < 10 NTUs)		3.76	5.20	5.75	5.01				
Color		Clr							
Odor/Evidence of LNAPL		No							

Notes: (i.e. actions taken if well dewater, difficulties in sampling through LNAPL, problems during purging/sampling, etc.)

1 US Gallon = 3.8 Liters.

Groundwater Purge and Sample Form (Minimal Drawdown)

Kennedy/Jenks Consultants

Date: 4-8-17
 Project Name: BNSF Wishram
 Project Number: 1796120*00
 Sampling Personnel: AML
 Water Level Meter: Solinst OWI
 Purging Equipment: Peristaltic Pump, Tubing
 Sampling Equipment: Peristaltic Pump, Tubing
 Sampling Time: 1255
 Total Discharge (gal): 1.5
 Water Disposal: On-Site 55-gallon drums

Well Number: WMW-15
 Monument Type: Stickup (ft PVC) Flush: X
 Well Diameter (in): 2
 Well Condition:
 Total Casing Depth (ft): 30.0
 Screened Interval (ft):
 Purge Depth (ft): 20
 Depth to Groundwater (ft): 14.60
 Depth to LNAPL (ft):
 Water Column (ft):

TOC

Weather: Partly Sunny

Water Quality Meter(s)	Model	Calibration Date/Time	QA/QC Samples		
Temp/pH/SC/ORP/DO:	YSI 556	4-17	Type	Sample ID	Time
Turbidity:	Micro TPI	4-17			
Other:					

Sample ID	Sample Containers				Field Filtered	Analysis Requested	MS/MSD & Comments	
	No.	Type	Pres.	Vol.				
WMW-15-20170418	2	VOA	HCl	40 mL	No	BTEX 8260		
	2	VOA	HCl	40 mL	No	NWTPH-Gx		
	2	VOA	HCl	40 mL	No	NWTPH-Dx w/o SGC		
		VOA	--	40 mL	No	PAHs 8270 SIM		
		Amber	--	100 mL	No	OMP Cresols 8270		
	2	VOA	HCl	40 mL	No	Methane RSK 175		
	1	HDPE	H2SO4	125 mL	No	Ammonia (350.1)		
	1	HDPE	H2SO4	250 mL	No	Nitrate-Nitrite (353.2)		
	1	HDPE	none	125 mL	No	Sulfate (300.0)		
	1	HDPE	NaOH/ZnAc	125 mL	No	Sulfide (376.2)		
	1	HDPE	HNO3	250 mL	No	Tot. Metals (Pb)		
	1	HDPE	HNO3	250 mL	Yes	Dis. Metals (Pb, Mn, Fe)		
	Total		14					

Parameter (every 5 min)	Time	1235	1240	1245	1250					
Flow Rate (L/min)	Start 1230	0.1	→							
Volume Purged (Liters)		0.5	1.0	1.5	2.0					
Water Depth (ft)		14.84	14.84	14.24	14.24					
Temperature (°C), (± 0.2)		14.98	14.48	14.32	14.27					
pH, (± 0.1)		8.06	7.90	7.85	7.81					
Sp. Conductance (uS/cm), (± 3%)		1117	1118	1118	1117					
DO (mg/L), (± 10% or 10% of 0.2mg/l)		1.51	0.78	0.63	0.61					
ORP (mV), (± 10%)		34.7	38.7	39.0	39.5					
Turbidity (NTU), (± 10% or 3 < 10 NTUs)		4.80	1.24	0.98	1.05					
Color		Clr	→							
Odor/Evidence of LNAPL		No	→							

Notes: (i.e. actions taken if well dewater, difficulties in sampling through LNAPL, problems during purging/sampling, etc.)

1 US Gallon = 3.8 Liters.

Groundwater Purge and Sample Form (Minimal Drawdown)

Kennedy/Jenks Consultants

Date: 4-18-17
 Project Name: BNSF Wishram
 Project Number: 1796120*00
 Sampling Personnel: AML
 Water Level Meter: Solinst OWI
 Purging Equipment: Peristaltic Pump, Tubing
 Sampling Equipment: Peristaltic Pump, Tubing
 Sampling Time: 1035
 Total Discharge (gal): 1.5
 Water Disposal: On-Site 55-gallon drums

Well Number: WMW-16
 Monument Type: Stickup (ft PVC) Flush: X
 Well Diameter (in): 2
 Well Condition:
 Total Casing Depth (ft): 30.0
 Screened Interval (ft): _____
 Purge Depth (ft): 20
 Depth to Groundwater (ft): 14.36
 Depth to LNAPL (ft): -
 Water Column (ft): _____

TOC

Weather: _____

Water Quality Meter(s)	Model	Calibration Date/Time	QA/QC Samples		
Temp/pH/SC/ORP/DO:	YSI 556	4.2017	Type	Sample ID	Time
Turbidity:	Micro TPI	4.2017			
Other:					

Sample ID	Sample Containers				Field Filtered	Analysis Requested	MS/MSD & Comments
	No.	Type	Pres.	Vol.			
WMW-16-20170418	2	VOA	HCl	40 mL	No	BTEX 8260	
	2	VOA	HCl	40 mL	No	NWTPH-Gx	
	2	VOA	HCl	40 mL	No	NWTPH-Dx w/o SGC	
	2	VOA	--	40 mL	No	PAHs 8270 SIM	
	2	Amber	--	100 mL	No	OMP Cresols 8270	
	2	VOA	HCl	40 mL	No	Methane RSK 175	
	1	HDPE	H2SO4	125 mL	No	Ammonia	
	1	HDPE	H2SO4	250 mL	No	Nitrate-Nitrite	
	1	HDPE	none	125 mL	No	Sulfate	
	1	HDPE	NaOH/ZnAc	125 mL	No	Sulfide	
	1	HDPE	HNO3	250 mL	No	Tot. Metals (Pb)	
	1	HDPE	HNO3	250 mL	Yes	Dis. Metals (Pb,Mn,Fe)	

Total 18

Parameter (every 5 min)	Time	1015	1020	1025	1030				
		5 min	5 min	5 min	5 min	min	min	min	min
Flow Rate (L/min)	Start 1010	0.1							
Volume Purged (Liters)		0.5	1.0	1.5	2.0				
Water Depth (ft)		13.76	13.76	13.76	13.76				
Temperature (°C), (± 0.2)		12.33	12.53	12.66	12.66				
pH, (± 0.1)		7.83	7.45	7.32	7.29				
Sp. Conductance (uS/cm), (± 3%)		445	423	417	415				
DO (mg/L), (± 10% or 10% of 0.2mg/l)		3.93	3.60	3.41	3.51				
ORP (mV), (± 10%)		34.4	66.9	75.6	77.9				
Turbidity (NTU), (± 10% or 3 <10 NTUs)		3.89	3.11	2.38	2.19				
Color		Clr							
Odor/Evidence of LNAPL		None							

Notes: (i.e. actions taken if well dewatered, difficulties in sampling through LNAPL, problems during purging/sampling, etc.)

1 US Gallon = 3.8 Liters.

Groundwater Purge and Sample Form (Minimal Drawdown)

Kennedy/Jenks Consultants

Date: 4/17/17
 Project Name: BNSF Wishram
 Project Number: 1796120*00
 Sampling Personnel: AML
 Water Level Meter: Solinst OWI
 Purging Equipment: Peristaltic Pump, Tubing
 Sampling Equipment: Peristaltic Pump, Tubing
 Sampling Time: 1235
 Total Discharge (gal): ~2.0
 Water Disposal: On-Site 55-gallon drums

Well Number: WMW-17
 Monument Type: Stickup (ft PVC) Flush: X
 Well Diameter (in): 2
 Well Condition: Good
 Total Casing Depth (ft): 30.0
 Screened Interval (ft): _____
 Purge Depth (ft): 20
 Depth to Groundwater (ft): 14.54
 Depth to LNAPL (ft): -
 Water Column (ft): _____

Weather: Most Sunny

TOC

Water Quality Meter(s)	Model	Calibration Date/Time	QA/QC Samples		
Temp/pH/SC/ORP/DO:	YSI 556	<u>5/17/17</u>	Type	Sample ID	Time
Turbidity:	Micro TPI	<u>4/17/17</u>	<u>Duplicate</u>	<u>D-1-201704 17</u>	--
Other:					

Sample ID	Sample Containers				Field Filtered	Analysis Requested	MS/MSD & Comments
	No.	Type	Pres.	Vol.			
<u>WMW-17-20170417</u>	2	VOA	HCl	40 mL	No	BTEX 8260	
	2	VOA	HCl	40 mL	No	NWTPH-Gx	
	2	VOA	HCl	40 mL	No	NWTPH-Dx w/o SGC	
	2	VOA	--	40 mL	No	PAHs 8270 SIM	
		Amber	--	100 mL	No	OMP Cresols 8270	
	2	VOA	HCl	40 mL	No	Methane RSK 175	
	1	HDPE	H2SO4	125 mL	No	Ammonia	
	1	HDPE	H2SO4	250 mL	No	Nitrate-Nitrite	
	1	HDPE	none	125 mL	No	Sulfate	
	1	HDPE	NaOH/ZnAc	125 mL	No	Sulfide	
	1	HDPE	HNO3	250 mL	No	Tot. Metals (Pb, As)	
	1	HDPE	HNO3	250 mL	Yes	Dis. Metals (Pb, As, Mn, Fe)	
Total		16					

Parameter (every 5 min)	Time	1210	1215	1220	1225	1230			
Flow Rate (L/min)	<u>1205 start</u>	0.1	→	→	→	→			
Volume Purged (Liters)		0.5	1.0	1.5	2.0	2.5			
Water Depth (ft)		14.60	14.63	14.63	14.64	14.64			
Temperature (°C), (± 0.2)		16.35	16.05	15.56	15.49	14.52			
pH, (± 0.1)		8.15	8.13	7.98	8.04	7.92			
Sp. Conductance (uS/cm), (± 3%)		1,255	1,221	1,083	1,047	980			
DO (mg/L), (± 10% or 10% of 0.2mg/l)		0.75	0.68	0.55	0.49	0.41			
ORP (mV), (± 10%)		-117.6	-122.7	-124.4	-123.8	-126.1			
Turbidity (NTU), (± 10% or 3 < 10 NTUs)		2.70	2.39	4.62	3.24	2.47			
Color		Clr	→	→	→	→			
Odor/Evidence of LNAPL		None	→	→	→	→			

Notes: (i.e. actions taken if well dewateres, difficulties in sampling through LNAPL, problems during purging/sampling, etc.)

1 US Gallon = 3.8 Liters.

Groundwater Purge and Sample Form (Minimal Drawdown)

Kennedy/Jenks Consultants

Date: 4-17-17
 Project Name: BNSF Wishram
 Project Number: 1796120*00
 Sampling Personnel: AML
 Water Level Meter: Solinst OWI
 Purging Equipment: Peristaltic Pump, Tubing
 Sampling Equipment: Peristaltic Pump, Tubing
 Sampling Time: 1610
 Total Discharge (gal): 2.0
 Water Disposal: On-Site 55-gallon drums

Well Number: WMW-18
 Monument Type: Stickup (ft PVC) Flush: X
 Well Diameter (in): 2
 Well Condition:
 Total Casing Depth (ft): 30.0
 Screened Interval (ft): _____
 Purge Depth (ft): 20
 Depth to Groundwater (ft): 14.41
 Depth to LNAPL (ft): _____
 Water Column (ft): _____

TOC

Weather: _____

Water Quality Meter(s)	Model	Calibration Date/Time	QA/QC Samples		
Temp/pH/SC/ORP/DO:	YSI 556	4-17-17	Type	Sample ID	Time
Turbidity:	Micro TPI	4-17-17	MS	WMW-18-20170417MS	
Other:			MSD	WMW-18-20170417MSD	

Sample ID	Sample Containers				Field Filtered	Analysis Requested	MS/MSD & Comments
	No.	Type	Pres.	Vol.			
WMW-18-20170417	2	VOA	HCl	40 mL	No	BTEX 8260	
	2	VOA	HCl	40 mL	No	NWTPH-Gx	
	2	VOA	HCl	40 mL	No	NWTPH-Dx w/o SGC	
	2	VOA	--	40 mL	No	PAHs 8270 SIM	
	2	Amber	--	100 mL	No	OMP Cresols 8270	
	2	VOA	HCl	40 mL	No	Methane RSK 175	
	1	HDPE	H2SO4	125 mL	No	Ammonia	
	1	HDPE	H2SO4	250 mL	No	Nitrate-Nitrite	
	1	HDPE	none	125 mL	No	Sulfate	
	1	HDPE	NaOH/ZnAc	125 mL	No	Sulfide	
	1	HDPE	HNO3	250 mL	No	Tot. Metals (Pb,As)	
1	HDPE	HNO3	250 mL	Yes	Dis.Metals (Pb,As,Mn,Fe)		

Total 18

Time	1505	1510	1515	1600	1605			
Parameter (every 5 min)	5 min	5 min	45 min	5 min	min	min	min	min
Flow Rate (L/min)	0.1	→			→			
Volume Purged (Liters)	0.5	1.0	5.0	6.0	6.5			
Water Depth (ft)	14.55	14.58	14.44	14.44	14.49			
Temperature (°C), (± 0.2)	14.65	14.22	14.13	14.21	14.29			
pH, (± 0.1)	9.01	8.75	8.21	8.18	8.15			
Sp. Conductance (uS/cm), (± 3%)	658	657	653	654	654			
DO (mg/L), (± 10% or 10% of 0.2mg/l)	4.53	2.43	0.79	0.50	0.45			
ORP (mV), (± 10%)	76.4	55.7	28.0	27.3	26.9			
Turbidity (NTU), (± 10% or 3 < 10 NTUs)	3.10	1.89	2.88	1.84	1.52			
Color	Clr	_____						
Odor/Evidence of LNAPL	No	_____						

Notes: (i.e. actions taken if well dewatered, difficulties in sampling through LNAPL, problems during purging/sampling, etc.)

1 US Gallon = 3.8 Liters.

18 to 20 September 2017

Groundwater Purge and Sample Form (Minimal Drawdown)

Kennedy/Jenks Consultants

Date: 9-14-17
 Project Name: BNSF Wishram
 Project Number: 1796120*00
 Sampling Personnel: Robinson
 Water Level Meter: Sofinst OWI
 Purging Equipment: Peristaltic Pump, Tubing
 Sampling Equipment: Peristaltic Pump, Tubing
 Sampling Time: 12:05
 Total Discharge (gal): _____
 Water Disposal: On-Site 55-gallon drums

Well Number: RMD-1
 Monument Type: Stickup (ft PVC) Flush: X
 Well Diameter (in): 2
 Well Condition: _____
 Total Casing Depth (ft): 44.5
 Screened Interval (ft): 29.6-44.6
 Purge Depth (ft): 37.5
 Depth to Groundwater (ft): 14.93'
 Depth to LNAPL (ft): —
 Water Column (ft): _____

TOC

Weather: cloudy

Water Quality Meter(s)	Model	Calibration Date/Time	QA/QC Samples		
Temp/pH/SC/ORP/DO:	YSI 556		Type	Sample ID	Time
Turbidity:	Micro TPI				
Other:					

Sample ID	Sample Containers				Field Filtered	Analysis Requested	MS/MSD & Comments
	No.	Type	Pres.	Vol.			
	2	VOA	HCl	40 mL	No	BTEX 8260	
	2	VOA	HCl	40 mL	No	NWTPH-Gx	
	2	VOA	HCl	40 mL	No	NWTPH-Dx w/o SGC	
	2	VOA	--	40 mL	No	PAHs 8270 SIM	
		Amber	--	100 mL	No	OMP Cresols 8270	
	2	VOA	HCl	40 mL	No	Methane RSK 175	
	1	HDPE	H2SO4	125 mL	No	Ammonia	
	1	HDPE	H2SO4	250 mL	No	Nitrate-Nitrite	
	1	HDPE	none	125 mL	No	Sulfate	
	1	HDPE	NaOH/ZnAc	125 mL	No	Sulfide	
	1	HDPE	HNO3	250 mL	No	Tot. Metals (Pb)	
	1	HDPE	HNO3	250 mL	Yes	Dis. Metals (Pb,Mn,Fe)	
Total		16					

	Time	11:50	11:55	12:00	12:05				
Parameter (every 5 min)		min	min	min	min	min	min	min	min
Flow Rate (L/min)		~1.2	~2	~2	~2				
Volume Purged (Liters)		~1	~2	~3	~4				
Water Depth (ft)		15.42	15.53	15.59	15.61				
Temperature (°C), (± 0.2)		17.08	16.83	16.65	16.90				
pH, (± 0.1)		7.21	7.22	7.21	7.21				
Sp. Conductance (uS/cm), (± 3%)		966	964	961	958				
DO (mg/L), (± 10% or 10% of 0.2mg/l)		1.01	0.57	0.41	0.35				
ORP (mV), (± 10%)		210.6	207.5	206.3	191.1				
Turbidity (NTU), (± 10% or 3 <10 NTUs)		3.58	2.12	2.98	2.76				
Color		clear	clear	clear	clear				
Odor/Evidence of LNAPL		none	none	none	none				

otes: (i.e. actions taken if well dewaterers, difficulties in sampling through LNAPL, problems during purging/sampling, etc.)

1 US Gallon = 3.8 Liters.

Groundwater Purge and Sample Form (Minimal Drawdown)

Kennedy/Jenks Consultants

Date: 9-19-17
 Project Name: BNSF Wishram
 Project Number: 1796120*00
 Sampling Personnel: Robinson
 Water Level Meter: Solinst OWI
 Purging Equipment: Peristaltic Pump, Tubing
 Sampling Equipment: Peristaltic Pump, Tubing
 Sampling Time: 18:52
 Total Discharge (gal): _____
 Water Disposal: On-Site 55-gallon drums

Well Number: RMD-2
 Monument Type: Stickup: _____ (ft PVC) Flush:
 Well Diameter (in): 2
 Well Condition: _____
 Total Casing Depth (ft): 50.0
 Screened Interval (ft): 30-50
 Purge Depth (ft): 40.0
 Depth to Groundwater (ft): 14.60
 Depth to LNAPL (ft): _____
 Water Column (ft): _____

TOC

Weather: _____

Water Quality Meter(s)	Model	Calibration Date/Time	QA/QC Samples		
Temp/pH/SC/ORP/DO:	YSI 556		Type	Sample ID	Time
Turbidity:	Micro TPI		Duplicate	D-2-201709 <u>19</u>	--
Other:					

Sample ID	Sample Containers				Field Filtered	Analysis Requested	MS/MSD & Comments
	No.	Type	Pres.	Vol.			
	2	VOA	HCl	40 mL	No	BTEX 8260	
	2	VOA	HCl	40 mL	No	NWTPH-Gx	
	2	VOA	HCl	40 mL	No	NWTPH-Dx w/o SGC	
	2	VOA	--	40 mL	No	PAHs 8270 SIM	
		Amber	--	100 mL	No	OMP Cresols 8270	
	2	VOA	HCl	40 mL	No	Methane RSK 175	
	1	HDPE	H2SO4	125 mL	No	Ammonia	
	1	HDPE	H2SO4	250 mL	No	Nitrate-Nitrite	
	1	HDPE	none	125 mL	No	Sulfate	
	1	HDPE	NaOH/ZnAc	125 mL	No	Sulfide	
	1	HDPE	HNO3	250 mL	No	Tot. Metals (Pb)	
	1	HDPE	HNO3	250 mL	Yes	Dis.Metals (Pb,Mn,Fe)	
Total	16						

Parameter (every 5 min)	Time	15:32	15:37	15:42	15:47	15:52			
		min	min	min	min	min	min	min	min
Flow Rate (L/min)		~2	~2	~2	~2	~2			
Volume Purged (Liters)		~1	~2	~3	~4	~5			
Water Depth (ft)		14.62	14.63	14.63	14.63	14.63			
Temperature (°C), (± 0.2)		17.35	17.13	17.22	17.26	17.25			
pH, (± 0.1)		7.38	7.37	7.34	7.39	7.39			
Sp. Conductance (uS/cm), (± 3%)		1163	1165	1165	1166	1168			
DO (mg/L), (± 10% or 10% of 0.2mg/l)		0.81	0.85	0.39	0.27	0.24			
ORP (mV), (± 10%)		103.0	102.4	101.0	94.2	90.2			
Turbidity (NTU), (± 10% or 3 < 10 NTUs)		3.31	2.73	1.97	2.21	2.13			
Color		clr	clr	clr	clr	clr			
Odor/Evidence of LNAPL		mid	mid	mid	mid	mid			

Notes: (i.e. actions taken if well dewater, difficulties in sampling through LNAPL, problems during purging/sampling, etc.)

1 US Gallon = 3.8 Liters.

Groundwater Purge and Sample Form (Minimal Drawdown)

Kennedy/Jenks Consultants

Date: 9/20/17
 Project Name: BNSF Wishram
 Project Number: 1796120*00
 Sampling Personnel: KET
 Water Level Meter: Solinst OWI
 Purging Equipment: Peristaltic Pump, Tubing
 Sampling Equipment: Peristaltic Pump, Tubing
 Sampling Time: 1835
 Total Discharge (gal): _____
 Water Disposal: On-Site 55-gallon drums
 Weather: Windy

Well Number: RMD-3
 Monument Type: Stickup: _____ (ft PVC) Flush:
 Well Diameter (in): 2
 Well Condition: good
 Total Casing Depth (ft): 60.0
 Screened Interval (ft): 40-60
 Purge Depth (ft): 50.0
 Depth to Groundwater (ft): 14.71
 Depth to LNAPL (ft): _____
 Water Column (ft): _____

TOC

Water Quality Meter(s)	Model	Calibration Date/Time	QA/QC Samples		
Temp/pH/SC/ORP/DO:	YSI 556		Type	Sample ID	Time
Turbidity:	Micro TPI				
Other:					

Sample ID	Sample Containers				Field Filtered	Analysis Requested	MS/MSD & Comments
	No.	Type	Pres.	Vol.			
	2	VOA	HCl	40 mL	No	BTEX 8260	
	2	VOA	HCl	40 mL	No	NWTPH-Gx	
	2	VOA	HCl	40 mL	No	NWTPH-Dx w/o SGC	
	2	VOA	--	40 mL	No	PAHs 8270 SIM	
		Amber	--	100 mL	No	OMP Cresols 8270	
	2	VOA	HCl	40 mL	No	Methane RSK 175	
	1	HDPE	H2SO4	125 mL	No	Ammonia	
	1	HDPE	H2SO4	250 mL	No	Nitrate-Nitrite	
	1	HDPE	none	125 mL	No	Sulfate	
	1	HDPE	NaOH/ZnAc	125 mL	No	Sulfide	
	1	HDPE	HNO3	250 mL	No	Tot. Metals (Pb)	
	1	HDPE	HNO3	250 mL	Yes	Dis. Metals (Pb,Mn,Fe)	

Total 16

Time	1810	1815	1820	1825	1830			
Parameter (every 5 min)	5 min	10 min	15 min	20 min	25 min	min	min	min
Flow Rate (L/min)	0.1							
Volume Purged (Liters)	0.5	1.0	1.5	2.0	2.5			
Water Depth (ft)	14.71	14.71	14.71	14.71	14.71			
Temperature (°C), (± 0.2)	16.18	16.11	16.09	16.06	15.96			
pH, (± 0.1)	7.54	7.45	7.43	7.43	7.42			
Sp. Conductance (uS/cm), (± 3%)	0.580	0.579	0.578	0.579	0.579			
DO (mg/L), (± 10% or 10% of 0.2mg/l)	1.07	0.47	0.39	0.37	0.39			
ORP (mV), (± 10%)	111.6	113.1	115.4	115.8	114.9			
Turbidity (NTU), (± 10% or 3 <10 NTUs)	2.21	1.93	1.11	1.34	1.81			
Color	clear							
Odor/Evidence of LNAPL	NO O/S							

Notes: (i.e. actions taken if well dewater, difficulties in sampling through LNAPL, problems during purging/sampling, etc.)

1 US Gallon = 3.8 Liters.

Groundwater Purge and Sample Form (Minimal Drawdown)

Kennedy/Jenks Consultants

Date: 2/20/17
 Project Name: BNSF Wishram
 Project Number: 1796120*00
 Sampling Personnel: KEF
 Water Level Meter: Solinst OWI
 Purging Equipment: Peristaltic Pump, Tubing
 Sampling Equipment: Peristaltic Pump, Tubing
 Sampling Time: 1715
 Total Discharge (gal): _____
 Water Disposal: On-Site 55-gallon drums
 Weather: windy, cloudy, rain

Well Number: RMD-4
 Monument Type: Stickup (ft PVC) Flush: X
 Well Diameter (in): 2
 Well Condition: good
 Total Casing Depth (ft): 65.0
 Screened Interval (ft): 45-65
 Purge Depth (ft): 55.0
 Depth to Groundwater (ft): 14.60
 Depth to LNAPL (ft): —
 Water Column (ft): _____

TOC

Water Quality Meter(s)	Model	Calibration Date/Time	QA/QC Samples		
Temp/pH/SC/ORP/DO:	YSI 556		Type	Sample ID	Time
Turbidity:	Micro TPI				
Other:					

Sample ID	Sample Containers				Field Filtered	Analysis Requested	MS/MSD & Comments
	No.	Type	Pres.	Vol.			
	2	VOA	HCl	40 mL	No	BTEX 8260	
	2	VOA	HCl	40 mL	No	NWTPH-Gx	
	2	VOA	HCl	40 mL	No	NWTPH-Dx w/o SGC	
	2	VOA	--	40 mL	No	PAHs 8270 SIM	
		Amber	--	100 mL	No	OMP Cresols 8270	
	2	VOA	HCl	40 mL	No	Methane RSK 175	
	1	HDPE	H2SO4	125 mL	No	Ammonia	
	1	HDPE	H2SO4	250 mL	No	Nitrate-Nitrite	
	1	HDPE	none	125 mL	No	Sulfate	
	1	HDPE	NaOH/ZnAc	125 mL	No	Sulfide	
	1	HDPE	HNO3	250 mL	No	Tot. Metals (Pb)	
	1	HDPE	HNO3	250 mL	Yes	Dis.Metals (Pb,Mn,Fe)	
Total	16						

Time	1655	1700	1705	1710	1715			
Parameter (every 5 min)	5 min	10 min	15 min	20 min	25 min	min	min	min
Flow Rate (L/min)	0.1							
Volume Purged (Liters)	0.5	1.0	1.5	2.0	2.5			
Water Depth (ft)	14.61	14.61	14.61	14.61				
Temperature (°C), (± 0.2)	16.37	16.48	16.15	16.13				
pH, (± 0.1)	7.41	7.35	7.36	7.36				
Sp. Conductance (µS/cm), (± 3%)	0.788	0.790	0.791	0.790				
DO (mg/L), (± 10% or 10% of 0.2mg/l)	1.16	0.62	0.58	0.55				
ORP (mV), (± 10%)	110.8	111.5	110.5	110.2				
Turbidity (NTU), (± 10% or 3 < 10 NTUs)	6.40	6.54	5.55	3.30				
Color	clear							
Odor/Evidence of LNAPL	no odors							

Conditions taken if well dewateres, difficulties in sampling through LNAPL, problems during purging/sampling, etc.)
 3.8 Liters.

Groundwater Purge and Sample Form (Minimal Drawdown)

Kennedy/Jenks Consultants

Date: 9/20/17 Well Number: WMW-01
 Project Name: BNSF Wishram Monument Type: Stickup: _____ (ft PVC) Flush:
 Project Number: 1796120*00 Well Diameter (in): 2
 Sampling Personnel: KBT Well Condition: good
 Water Level Meter: Solinst OWI Total Casing Depth (ft): 20.0
 Purging Equipment: Peristaltic Pump, Tubing Screened Interval (ft): 10-20
 Sampling Equipment: Peristaltic Pump, Tubing Purge Depth (ft): 15.0
 Sampling Time: 1020 Depth to Groundwater (ft): 10.39
 Total Discharge (gal): _____ Depth to LNAPL (ft): —
 Water Disposal: On-Site 55-gallon drums Water Column (ft): _____
 Weather: rainy

TOC

Water Quality Meter(s)	Model	Calibration Date/Time	QA/QC Samples		
Temp/pH/SC/ORP/DO:	YSI 556		Type	Sample ID	Time
Turbidity:	Micro TPI				
Other:					

Sample ID	Sample Containers				Field Filtered	Analysis Requested	MS/MSD & Comments
	No.	Type	Pres.	Vol.			
	2	VOA	HCl	40 mL	No	BTEX 8260	
	2	VOA	HCl	40 mL	No	NWTPH-Gx	
	2	VOA	HCl	40 mL	No	NWTPH-Dx w/o SGC	
		VOA	--	40 mL	No	PAHs 8270 SIM	
		Amber	--	100 mL	No	OMP Cresols 8270	
	2	VOA	HCl	40 mL	No	Methane RSK 175	
	1	HDPE	H2SO4	125 mL	No	Ammonia (350.1)	
	1	HDPE	H2SO4	250 mL	No	Nitrate-Nitrite (353.2)	
	1	HDPE	none	125 mL	No	Sulfate (300.0)	
	1	HDPE	NaOH/ZnAc	125 mL	No	Sulfide (376.2)	
	1	HDPE	HNO3	250 mL	No	Tot. Metals (Pb)	
	1	HDPE	HNO3	250 mL	Yes	Dis. Metals (Pb, Mn, Fe)	
Total	14						

	0935 Time	0940	0945	0950	0955	1000	1005	1010	1015
Parameter (every 5 min)	5 min	10 min	15 min	20 min	25 min	30 min	35 min	40 min	
Flow Rate (L/min)	0.1	—	—	—	—	—	—	—	—
Volume Purged (Liters)	0.5	1.0	1.5	2.0	2.5	3.0	3.5	4.0	
Water Depth (ft)	10.48	10.48	10.48	10.48	10.49	10.50	10.51	10.51	
Temperature (°C), (± 0.2)	18.01	18.03	18.09	18.39	18.40	18.00	17.88	18.00	
pH, (± 0.1)	7.02	7.00	6.98	6.97	6.97	6.97	6.95	6.95	
Sp. Conductance (µS/cm), (± 3%)	0.834	0.832	0.830	0.828	0.832	0.833	0.833	0.832	
DO (mg/L), (± 10% or 10% of 0.2mg/l)	1.06	1.03	0.77	0.67	0.54	0.42	0.53	0.41	
ORP (mV), (± 10%)	-133.7	-130.4	-112.7	-127.5	133.2	139.6	142.6	139.5	
Turbidity (NTU), (± 10% or 3 <10 NTUs)	6.55	8.67	7.85	13.27	13.05	10.88	10.80	13.69	
Color	clear	clear	—	—	—	—	—	—	
Odor/Evidence of LNAPL	no o/s	no o/s	—	—	—	—	—	—	

Notes: (i.e. actions taken if well dewateres, difficulties in sampling through LNAPL, problems during purging/sampling, etc.)
 1 US Gallon = 3.8 Liters.

Groundwater Purge and Sample Form (Minimal Drawdown)

Kennedy/Jenks Consultants

Date: 9/20/17
 Project Name: BNSF Wishram
 Project Number: 1796120*00
 Sampling Personnel: KET
 Water Level Meter: Solinst OWI
 Purging Equipment: Peristaltic Pump, Tubing
 Sampling Equipment: Peristaltic Pump, Tubing
 Sampling Time: 1220
 Total Discharge (gal): _____
 Water Disposal: On-Site 55-gallon drums
 Weather: cloudy

Well Number: WMW-03
 Monument Type: Stickup: _____ (ft PVC) Flush:
 Well Diameter (in): 2
 Well Condition: OK
 Total Casing Depth (ft): 20.0
 Screened Interval (ft): 10-20
 Purge Depth (ft): 15.0
 Depth to Groundwater (ft): 10.76
 Depth to LNAPL (ft): _____
 Water Column (ft): _____

TOC

Water Quality Meter(s)	Model	Calibration Date/Time	QA/QC Samples		
Temp/pH/SC/ORP/DO:	YSI 556		Type	Sample ID	Time
Turbidity:	Micro TPI				
Other:					

Sample ID	Sample Containers				Field Filtered	Analysis Requested	MS/MSD & Comments
	No.	Type	Pres.	Vol.			
	2	VOA	HCl	40 mL	No	BTEX 8260	
	2	VOA	HCl	40 mL	No	NWTPH-Gx	
	2	VOA	HCl	40 mL	No	NWTPH-Dx w/o SGC	
		VOA	--	40 mL	No	PAHs 8270 SIM	
		Amber	--	100 mL	No	OMP Cresols 8270	
	2	VOA	HCl	40 mL	No	Methane RSK 175	
	1	HDPE	H2SO4	125 mL	No	Ammonia (350.1)	
	1	HDPE	H2SO4	250 mL	No	Nitrate-Nitrite (353.2)	
	1	HDPE	none	125 mL	No	Sulfate (300.0)	
	1	HDPE	NaOH/ZnAc	125 mL	No	Sulfide (376.2)	
	1	HDPE	HNO3	250 mL	No	Tot. Metals (Pb)	
	1	HDPE	HNO3	250 mL	Yes	Dis. Metals (Pb, Mn, Fe)	
Total		14					

Time	1135	1140	1145	1150	1155	1200	1205	1210	1215
Parameter (every 5 min)		5 min	10 min	15 min	20 min	25 min	30 min	35 min	40 min
Flow Rate (L/min)		0.1							
Volume Purged (Liters)		0.5	1.0	1.5	2.0	2.5	3.0	3.5	4.0
Water Depth (ft)		10.82	10.82	10.82	10.82	10.82	10.82	10.82	10.82
Temperature (°C), (± 0.2)		20.22	19.82	19.78	19.68	19.62	19.28	19.09	19.41
pH, (± 0.1)		7.01	6.97	6.96	6.96	6.97	6.96	6.96	6.99
Sp. Conductance (µS/cm), (± 3%)		1.209	1.209	1.210	1.211	1.212	1.207	1.207	1.204
DO (mg/L), (± 10% or 10% of 0.2mg/l)		0.67	0.47	0.42	0.57	0.51	0.43	0.26	0.38
ORP (mV), (± 10%)		-113.4	-118.3	-114.7	-116.0	-108.7	-113.8	-114.7	-100.3
Turbidity (NTU), (± 10% or 3 < 10 NTUs)		15.59	8.11	8.02	8.81	9.67	10.57	11.01	10.10
Color		clear							
Odor/Evidence of LNAPL		no oil							

Notes: (i.e. actions taken if well dewater, difficulties in sampling through LNAPL, problems during purging/sampling, etc.)
 1 US Gallon = 3.8 Liters.

Groundwater Purge and Sample Form (Minimal Drawdown)

Kennedy/Jenks Consultants

Date: 9-20-17
 Project Name: BNSF Wishram
 Project Number: 1796120*00
 Sampling Personnel: Hobinson
 Water Level Meter: Solinst OWI
 Purging Equipment: Peristaltic Pump, Tubing
 Sampling Equipment: Peristaltic Pump, Tubing
 Sampling Time: 16:45
 Total Discharge (gal): _____
 Water Disposal: On-Site 55-gallon drums

Well Number: WMW-05
 Monument Type: Stickup (ft PVC) Flush: X
 Well Diameter (in): 2
 Well Condition: _____
 Total Casing Depth (ft): 25.0
 Screened Interval (ft): 15-25
 Purge Depth (ft): 20.0
 Depth to Groundwater (ft): 19.32
 Depth to LNAPL (ft): —
 Water Column (ft): _____

TOC

Weather: _____

Water Quality Meter(s)	Model	Calibration Date/Time	QA/QC Samples		
Temp/pH/SC/ORP/DO:	YSI 556		Type	Sample ID	Time
Turbidity:	Micro TPI				
Other:					

Sample ID	Sample Containers				Field Filtered	Analysis Requested	MS/MSD & Comments
	No.	Type	Pres.	Vol.			
	2	VOA	HCl	40 mL	No	BTEX 8260	
	2	VOA	HCl	40 mL	No	NWTPH-Gx	
	2	VOA	HCl	40 mL	No	NWTPH-Dx w/o SGC	
		VOA	--	40 mL	No	PAHs 8270 SIM	
		Amber	--	100 mL	No	OMP Cresols 8270	
	2	VOA	HCl	40 mL	No	Methane RSK 175	
	1	HDPE	H2SO4	125 mL	No	Ammonia (350.1)	
	1	HDPE	H2SO4	250 mL	No	Nitrate-Nitrite (353.2)	
	1	HDPE	none	125 mL	No	Sulfate (300.0)	
	1	HDPE	NaOH/ZnAc	125 mL	No	Sulfide (376.2)	
	1	HDPE	HNO3	250 mL	No	Tot. Metals (Pb)	
	1	HDPE	HNO3	250 mL	Yes	Dis. Metals (Pb, Mn, Fe)	

Total 14

Parameter (every 5 min)	Time	4:25	4:30	4:35	4:40				
		min	min	min	min	min	min	min	min
Flow Rate (L/min)		~.2	~.2	~.2	~.2	~.2			
Volume Purged (Liters)		~1	~2	~3	~4	~5			
Water Depth (ft)		10.33	10.34	10.34	10.34	10.35			
Temperature (°C), (± 0.2)		16.37	16.57	16.33	16.35	16.41			
pH, (± 0.1)		7.44	7.57	7.64	7.63	7.82			
Sp. Conductance (uS/cm), (± 3%)		1500	1660	1930	2250	240			
DO (mg/L), (± 10% or 10% of 0.2mg/l)		6.59	6.91	7.61	7.97	7.14			
ORP (mV), (± 10%)		291.5	286.3	294.8	278.5	279.8			
Turbidity (NTU), (± 10% or 3 < 10 NTUs)		35.86	24.96	13.50	10.82	9.67			
Color		clr	clr	clr	clr	clr			
Odor/Evidence of LNAPL		none							

Notes: (i.e. actions taken if well dewateres, difficulties in sampling through LNAPL, problems during purging/sampling, etc.)

1 US Gallon = 3.8 Liters. small white particles in water

Groundwater Purge and Sample Form (Minimal Drawdown)

Kennedy/Jenks Consultants

Date: 9/19/17 Well Number: WMW-07
 Project Name: BNSF Wishram Monument Type: Stickup (ft PVC) Flush: X
 Project Number: 1796120*00 Well Diameter (in): 2
 Sampling Personnel: KET Well Condition: okay
 Water Level Meter: Solinst OWI Total Casing Depth (ft): 20.0
 Purging Equipment: Peristaltic Pump, Tubing Screened Interval (ft): 10-20
 Sampling Equipment: Peristaltic Pump, Tubing Purge Depth (ft): ~15
 Sampling Time: _____ Depth to Groundwater (ft): 11.81
 Total Discharge (gal): _____ Depth to LNAPL (ft): —
 Water Disposal: On-Site 55-gallon drums Water Column (ft): 8.19

Weather: _____

Water Quality Meter(s)	Model	Calibration Date/Time	QA/QC Samples		
Temp/pH/SC/ORP/DO:	YSI 556	9/15/17	Type	Sample ID	Time
Turbidity:	Micro TPI				
Other:					

Sample ID	Sample Containers				Field Filtered	Analysis Requested	MS/MSD & Comments
	No.	Type	Pres.	Vol.			
	2	VOA	HCl	40 mL	No	BTEX 8260	
	2	VOA	HCl	40 mL	No	NWTPH-Gx	
	2	VOA	HCl	40 mL	No	NWTPH-Dx w/o SGC	
		VOA	--	40 mL	No	PAHs 8270 SIM	
		Amber	--	100 mL	No	OMP Cresols 8270	
	2	VOA	HCl	40 mL	No	Methane RSK 175	
	1	HDPE	H2SO4	125 mL	No	Ammonia (350.1)	
	1	HDPE	H2SO4	250 mL	No	Nitrate-Nitrite (353.2)	
	1	HDPE	none	125 mL	No	Sulfate (300.0)	
	1	HDPE	NaOH/ZnAc	125 mL	No	Sulfide (376.2)	
	1	HDPE	HNO3	250 mL	No	Tot. Metals (Pb)	
	1	HDPE	HNO3	250 mL	Yes	Dis. Metals (Pb,Mn,Fe)	
Total	14						

Time	0820	0825	0830	0835	0840			
Parameter (every 5 min)	5 min	10 min	15 min	20 min	25 min	min	min	min
Flow Rate (L/min)	0.1	—	—	—	—			
Volume Purged (Liters)	0.5	1	1.5	2.0	2.5			
Water Depth (ft)	11.85	11.86	11.86	11.86	11.86			
Temperature (°C), (± 0.2)	17.26	17.38	17.55	17.63	11.66			
pH, (± 0.1)	6.99	7.09	7.10	7.11	7.11			
Sp. Conductance (µS/cm), (± 3%)	1.308	1.315	1.315	1.318	1.323			
DO (mg/L), (± 10% or 10% of 0.2mg/l)	0.93	1.41	0.94	0.80	0.67			
ORP (mV), (± 10%)	-107.4	-105.4	-106.9	-114.0	-111.6			
Turbidity (NTU), (± 10% or 3 <10 NTUs)	2.45	1.31	1.59	2.03	1.83			
Color	clear	clear	clear	clear	clear			
Odor/Evidence of LNAPL	slight sheen	sheen	—	—	—			

Notes: (i.e. actions taken if well dewater, difficulties in sampling through LNAPL, problems during purging/sampling, etc.)

1 US Gallon = 3.8 Liters.

sheen in water, called Ryan. did not sample

Groundwater Purge and Sample Form (Minimal Drawdown)

Kennedy/Jenks Consultants

Date: 9/19/17
 Project Name: BNSF Wishram
 Project Number: 1796120*00
 Sampling Personnel: KET
 Water Level Meter: Solinst OWI
 Purging Equipment: Peristaltic Pump, Tubing
 Sampling Equipment: Peristaltic Pump, Tubing
 Sampling Time:
 Total Discharge (gal):
 Water Disposal: On-Site 55-gallon drums

Well Number: WMW-08
 Monument Type: Stickup: (ft PVC) Flush: X
 Well Diameter (in): 2
 Well Condition: good
 Total Casing Depth (ft): 25.0
 Screened Interval (ft): 7-22
 Purge Depth (ft): ~15
 Depth to Groundwater (ft): 11.41
 Depth to LNAPL (ft):
 Water Column (ft):

TOC

Weather: cloudy

Water Quality Meter(s)	Model	Calibration Date/Time	QA/QC Samples		
Temp/pH/SC/ORP/DO:	YSI 556		Type	Sample ID	Time
Turbidity:	Micro TPI				
Other:					

Sample ID	Sample Containers				Field Filtered	Analysis Requested	MS/MSD & Comments
	No.	Type	Pres.	Vol.			
	2	VOA	HCl	40 mL	No	BTEX 8260	
	2	VOA	HCl	40 mL	No	NWTPH-Gx	
	2	VOA	HCl	40 mL	No	NWTPH-Dx w/o SGC	
		VOA	--	40 mL	No	PAHs 8270 SIM	
		Amber	--	100 mL	No	OMP Cresols 8270	
	2	VOA	HCl	40 mL	No	Methane RSK 175	
	1	HDPE	H2SO4	125 mL	No	Ammonia (350.1)	
	1	HDPE	H2SO4	250 mL	No	Nitrate-Nitrite (353.2)	
	1	HDPE	none	125 mL	No	Sulfate (300.0)	
	1	HDPE	NaOH/ZnAc	125 mL	No	Sulfide (376.2)	
	1	HDPE	HNO3	250 mL	No	Tot. Metals (Pb)	
	1	HDPE	HNO3	250 mL	Yes	Dis. Metals (Pb,Mn,Fe)	

Total 14

Parameter (every 5 min)	Time	9:10	9:15						
		5 min	10 min	min	min	min	min	min	min
Flow Rate (L/min)	0905	0.1	—						
Volume Purged (Liters)		0.5	1.0						
Water Depth (ft)		11.46	11.46						
Temperature (°C), (± 0.2)		7.19	17.72						
pH, (± 0.1)		7.76	7.18						
Sp. Conductance (uS/cm), (± 3%)		1.232	1.237						
DO (mg/L), (± 10% or 10% of 0.2mg/l)		0.89	0.65						
ORP (mV), (± 10%)		-106.3	-107.6						
Turbidity (NTU), (± 10% or 3 <10 NTUs)		2.85	2.25						
Color		clear	clear						
Odor/Evidence of LNAPL		slight	sheen						

Notes: (i.e. actions taken if well dewateres, difficulties in sampling through LNAPL, problems during purging/sampling, etc.)

1 US Gallon = 3.8 Liters.

sheen. did not sample

Groundwater Purge and Sample Form (Minimal Drawdown)

Kennedy/Jenks Consultants

Date: 9/19/17 Well Number: WMW-09
 Project Name: BNSF Wishram Monument Type: Stickup: _____ (ft PVC) Flush:
 Project Number: 1796120*00 Well Diameter (in): 2
 Sampling Personnel: KBT Well Condition: good
 Water Level Meter: Solinst OWI Total Casing Depth (ft): 25.0
 Purging Equipment: Peristaltic Pump, Tubing Screened Interval (ft): 8.5-23.5
 Sampling Equipment: Peristaltic Pump, Tubing Purge Depth (ft): 15.0
 Sampling Time: 1100 Depth to Groundwater (ft): 10.94
 Total Discharge (gal): _____ Depth to LNAPL (ft): —
 Water Disposal: On-Site 55-gallon drums Water Column (ft): _____
 Weather: cloudy

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Water Quality Meter(s)	Model	Calibration Date/Time	QA/QC Samples		
Temp/pH/SC/ORP/DO:	YSI 556		Type	Sample ID	Time
Turbidity:	Micro TPI				
Other:					

Sample ID	Sample Containers				Field Filtered	Analysis Requested	MS/MSD & Comments
	No.	Type	Pres.	Vol.			
	2	VOA	HCl	40 mL	No	BTEX 8260	
	2	VOA	HCl	40 mL	No	NWTPH-Gx	
	2	VOA	HCl	40 mL	No	NWTPH-Dx w/o SGC	
		VOA	--	40 mL	No	PAHs 8270 SIM	
		Amber	--	100 mL	No	OMP Cresols 8270	
	2	VOA	HCl	40 mL	No	Methane RSK 175	
	1	HDPE	H2SO4	125 mL	No	Ammonia (350.1)	
	1	HDPE	H2SO4	250 mL	No	Nitrate-Nitrite (353.2)	
	1	HDPE	none	125 mL	No	Sulfate (300.0)	
	1	HDPE	NaOH/ZnAc	125 mL	No	Sulfide (376.2)	
	1	HDPE	HNO3	250 mL	No	Tot. Metals (Pb)	
	1	HDPE	HNO3	250 mL	Yes	Dis. Metals (Pb, Mn, Fe)	
Total	14						

Time	1535	1540	1545	1550	1555			
Parameter (every 5 min)	5 min	10 min	15 min	20 min	25 min	min	min	min
Flow Rate (L/min)	0.1							
Volume Purged (Liters)	0.5	1.0	1.5	2.0	2.5			
Water Depth (ft)	11.03	11.03	11.03	11.03	11.03			
Temperature (°C), (± 0.2)	19.19	19.08	18.98	18.80	18.76			
pH, (± 0.1)	7.51	7.45	7.42	7.42	7.42			
Sp. Conductance (µS/cm), (± 3%)	0.552	0.548	0.549	0.551	0.552			
DO (mg/L), (± 10% or 10% of 0.2mg/l)	2.10	1.02	0.81	0.89	0.87			
ORP (mV), (± 10%)	85.2	91.6	95.9	97.4	100.6			
Turbidity (NTU), (± 10% or 3 < 10 NTUs)	1.85	1.88	0.68	1.29	1.42			
Color	clear	—	—	—	—			
Odor/Evidence of LNAPL	no	—	—	—	—			

Notes: (i.e. actions taken if well dewater, difficulties in sampling through LNAPL, problems during purging/sampling, etc.)
 1 US Gallon = 3.8 Liters.

Groundwater Purge and Sample Form (Minimal Drawdown)

Kennedy/Jenks Consultants

Date: 9/19/17 Well Number: WMW-10
 Project Name: BNSF Wishram Monument Type: Stickup: (ft PVC) Flush: X
 Project Number: 1796120*00 Well Diameter (in): 2
 Sampling Personnel: KEP Well Condition: good
 Water Level Meter: Solinst OWI Total Casing Depth (ft): 25.0
 Purging Equipment: Peristaltic Pump, Tubing Screened Interval (ft): 7.5-22.5
 Sampling Equipment: Peristaltic Pump, Tubing Purge Depth (ft): 15.0
 Sampling Time: 1440 Depth to Groundwater (ft): 10.96
 Total Discharge (gal): _____ Depth to LNAPL (ft): —
 Water Disposal: On-Site 55-gallon drums Water Column (ft): _____

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Weather: _____

Water Quality Meter(s)	Model	Calibration Date/Time	QA/QC Samples		
Temp/pH/SC/ORP/DO:	YSI 556		Type	Sample ID	Time
Turbidity:	Micro TPI				
Other:					

Sample ID	Sample Containers				Field Filtered	Analysis Requested	MS/MSD & Comments
	No.	Type	Pres.	Vol.			
	2	VOA	HCl	40 mL	No	BTEX 8260	
	2	VOA	HCl	40 mL	No	NWTPH-Gx	
	2	VOA	HCl	40 mL	No	NWTPH-Dx w/o SGC	
		VOA	--	40 mL	No	PAHs 8270 SIM	
		Amber	--	100 mL	No	OMP Cresols 8270	
	2	VOA	HCl	40 mL	No	Methane RSK 175	
	1	HDPE	H2SO4	125 mL	No	Ammonia (350.1)	
	1	HDPE	H2SO4	250 mL	No	Nitrate-Nitrite (353.2)	
	1	HDPE	none	125 mL	No	Sulfate (300.0)	
	1	HDPE	NaOH/ZnAc	125 mL	No	Sulfide (376.2)	
	1	HDPE	HNO3	250 mL	No	Tot. Metals (Pb)	
	1	HDPE	HNO3	250 mL	Yes	Dis.Metals (Pb,Mn,Fe)	
Total	14						

Parameter (every 5 min)	Time	1420	1425	1430	1435				
	5 min	10 min	15 min	20 min	min	min	min	min	min
Flow Rate (L/min)	0.1	—	—	—	—	—	—	—	—
Volume Purged (Liters)	0.5	1.0	1.5	2.0	—	—	—	—	—
Water Depth (ft)	10.99	11.00	11.00	11.00	—	—	—	—	—
Temperature (°C), (± 0.2)	18.54	19.09	19.11	19.23	—	—	—	—	—
pH, (± 0.1)	7.57	7.48	7.48	7.47	—	—	—	—	—
Sp. Conductance (µS/cm), (± 3%)	0.784	0.775	0.777	0.773	—	—	—	—	—
DO (mg/L), (± 10% or 10% of 0.2mg/l)	2.38	1.75	1.91	1.72	—	—	—	—	—
ORP (mV), (± 10%)	81.4	88.2	89.2	90.0	—	—	—	—	—
Turbidity (NTU), (± 10% or 3 <10 NTUs)	1.79	0.93	1.53	1.03	—	—	—	—	—
Color	clear	—	—	—	—	—	—	—	—
Odor/Evidence of LNAPL	no o/s	—	—	—	—	—	—	—	—

Notes: (i.e. actions taken if well dewater, difficulties in sampling through LNAPL, problems during purging/sampling, etc.)

1 US Gallon = 3.8 Liters.

Groundwater Purge and Sample Form (Minimal Drawdown)

Kennedy/Jenks Consultants

Date: 9/20/17
 Project Name: BNSF Wishram
 Project Number: 1796120*00
 Sampling Personnel: KBT
 Water Level Meter: Solinst OWI
 Purging Equipment: Peristaltic Pump, Tubing
 Sampling Equipment: Peristaltic Pump, Tubing
 Sampling Time: 0815
 Total Discharge (gal): _____
 Water Disposal: On-Site 55-gallon drums
 Weather: YUMMY

Well Number: WMW-11
 Monument Type: Stickup: _____ (ft PVC) Flush:
 Well Diameter (in): 2
 Well Condition: good
 Total Casing Depth (ft): 25.0
 Screened Interval (ft): 7-22
 Purge Depth (ft): 15.0
 Depth to Groundwater (ft): 10.92
 Depth to LNAPL (ft): —
 Water Column (ft): _____

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Water Quality Meter(s)	Model	Calibration Date/Time	QA/QC Samples		
Temp/pH/SC/ORP/DO:	YSI 556		Type	Sample ID	Time
Turbidity:	Micro TPI				
Other:					

Sample ID	Sample Containers				Field Filtered	Analysis Requested	MS/MSD & Comments
	No.	Type	Pres.	Vol.			
	2	VOA	HCl	40 mL	No	BTEX 8260	
	2	VOA	HCl	40 mL	No	NWTPH-Gx	
	2	VOA	HCl	40 mL	No	NWTPH-Dx w/o SGC	
		VOA	--	40 mL	No	PAHs 8270 SIM	
		Amber	--	100 mL	No	OMP Cresols 8270	
	2	VOA	HCl	40 mL	No	Methane RSK 175	
	1	HDPE	H2SO4	125 mL	No	Ammonia (350.1)	
	1	HDPE	H2SO4	250 mL	No	Nitrate-Nitrite (353.2)	
	1	HDPE	none	125 mL	No	Sulfate (300.0)	
	1	HDPE	NaOH/ZnAc	125 mL	No	Sulfide (376.2)	
	1	HDPE	HNO3	250 mL	No	Tot. Metals (Pb)	
	1	HDPE	HNO3	250 mL	Yes	Dis. Metals (Pb, Mn, Fe)	
Total				14			

Time	0735	0740	0745	0750	0755	0800	0805	0810
<u>0730</u> Parameter (every 5 min)	5 min	10 min	15 min	20 min	25 min	30 min	35 min	40 min
Flow Rate (L/min)	0.1	—	—	—	—	—	—	—
Volume Purged (Liters)	0.5	1.0	1.5	2.0	2.5	3.0	3.5	4.0
Water Depth (ft)	10.95	10.96	10.96	10.96	10.96	10.97	10.97	10.97
Temperature (°C), (± 0.2)	15.41	15.51	15.73	15.87	16.00	16.08	15.91	16.08
pH, (± 0.1)	7.42	7.40	7.41	7.42	7.43	7.43	7.44	7.44
Sp. Conductance (µS/cm), (± 3%)	1.046	1.060	1.060	1.059	1.062	1.063	1.064	1.061
DO (mg/L), (± 10% or 10% of 0.2mg/l)	0.77	0.71	0.82	0.79	0.68	0.66	0.59	0.44
ORP (mV), (± 10%)	-99.7	-129.0	-141.1	-133.0	-141.7	-148.0	-139.1	-139.6
Turbidity (NTU), (± 10% or 3 <10 NTUs)	11.65	7.42	9.62	9.87	9.27	10.97	7.17	6.61
Color	clear	—	—	—	—	—	—	—
Odor/Evidence of LNAPL	NO O/S	—	—	—	—	—	—	—

Notes: (i.e. actions taken if well dewater, difficulties in sampling through LNAPL, problems during purging/sampling, etc.)
 1 US Gallon = 3.8 Liters.

Groundwater Purge and Sample Form (Minimal Drawdown)

Kennedy/Jenks Consultants

Date: 9/19/17
 Project Name: BNSF Wishram
 Project Number: 1796120*00
 Sampling Personnel: KEE
 Water Level Meter: Solinst OWI
 Purging Equipment: Peristaltic Pump, Tubing
 Sampling Equipment: Peristaltic Pump, Tubing
 Sampling Time: 1020
 Total Discharge (gal): _____
 Water Disposal: On-Site 55-gallon drums

Well Number: WMW-12
 Monument Type: Stickup: _____ (ft PVC) Flush:
 Well Diameter (in): 2
 Well Condition: good
 Total Casing Depth (ft): 25.0
 Screened Interval (ft): 6-21
 Purge Depth (ft): 15.0
 Depth to Groundwater (ft): 11-10
 Depth to LNAPL (ft): —
 Water Column (ft): _____

TOC

Weather: cloudy

Water Quality Meter(s)	Model	Calibration Date/Time	QA/QC Samples		
Temp/pH/SC/ORP/DO:	YSI 556		Type	Sample ID	Time
Turbidity:	Micro TPI				
Other:					

Sample ID	Sample Containers				Field Filtered	Analysis Requested	MS/MSD & Comments
	No.	Type	Pres.	Vol.			
	2	VOA	HCl	40 mL	No	BTEX 8260	
	2	VOA	HCl	40 mL	No	NWTPH-Gx	
	2	VOA	HCl	40 mL	No	NWTPH-Dx w/o SGC	
	2	VOA	--	40 mL	No	PAHs 8270 SIM	
	2	Amber	--	100 mL	No	OMP Cresols 8270	
	2	VOA	HCl	40 mL	No	Methane RSK 175	
	1	HDPE	H2SO4	125 mL	No	Ammonia	
	1	HDPE	H2SO4	250 mL	No	Nitrate-Nitrite	
	1	HDPE	none	125 mL	No	Sulfate	
	1	HDPE	NaOH/ZnAc	125 mL	No	Sulfide	
	1	HDPE	HNO3	250 mL	No	Tot. Metals (Pb)	
	1	HDPE	HNO3	250 mL	Yes	Dis. Metals (Pb, Mn, Fe)	

Total 18

Time	0940	0945	0950	0955	1000	1005	1010	1015
Parameter (every 5 min)	5 min	10 min	15 min	20 min	25 min	30 min	35 min	40 min
Flow Rate (L/min)	0.1							
Volume Purged (Liters)	0.5	1.0	1.5	2.0	2.5	3.0	3.5	4.0
Water Depth (ft)	11.12	11.13	11.14	11.14	11.14	11.14	11.14	11.14
Temperature (°C), (± 0.2)	17.84	17.95	17.82	17.87	17.63	17.50	17.61	17.83
pH, (± 0.1)	7.70	7.73	7.71	7.73	7.71	7.69	7.69	7.68
Sp. Conductance (µS/cm), (± 3%)	0.964	0.962	0.961	0.962	0.963	0.958	0.958	0.958
DO (mg/L), (± 10% or 10% of 0.2mg/l)	0.47	0.67	0.60	0.52	0.47	0.44	0.57	0.58
ORP (mV), (± 10%)	19.6	29.9	30.6	30.5	31.5	34.0	38.5	39.0
Turbidity (NTU), (± 10% or 3 < 10 NTUs)	2.00	2.17	2.58	2.47	2.81	2.82	2.06	1.58
Color	clear	—	—	—	—	—	—	—
Odor/Evidence of LNAPL	no o/s	—	—	—	—	—	—	—

Notes: (i.e. actions taken if well dewater, difficulties in sampling through LNAPL, problems during purging/sampling, etc.)
 1 US Gallon = 3.8 Liters.

Groundwater Purge and Sample Form (Minimal Drawdown)

Kennedy/Jenks Consultants

Date: 9/19/17 Well Number: WMW-13
 Project Name: BNSF Wishram Monument Type: Stickup (ft PVC) Flush: X
 Project Number: 1796120*00 Well Diameter (in): 2
 Sampling Personnel: KET Well Condition: good
 Water Level Meter: Solinst OWI Total Casing Depth (ft): 25.0
 Purging Equipment: Peristaltic Pump, Tubing Screened Interval (ft): 6-21
 Sampling Equipment: Peristaltic Pump, Tubing Purge Depth (ft): 15.0
 Sampling Time: 1155 Depth to Groundwater (ft): 11.53
 Total Discharge (gal): _____ Depth to LNAPL (ft): _____
 Water Disposal: On-Site 55-gallon drums Water Column (ft): _____
 Weather: _____

TOC

Water Quality Meter(s)	Model	Calibration Date/Time	QA/QC Samples		
Temp/pH/SC/ORP/DO:	YSI 556		Type	Sample ID	Time
Turbidity:	Micro TPI				
Other:					

Sample ID	Sample Containers				Field Filtered	Analysis Requested	MS/MSD & Comments
	No.	Type	Pres.	Vol.			
	2	VOA	HCl	40 mL	No	BTEX 8260	
	2	VOA	HCl	40 mL	No	NWTPH-Gx	
	2	VOA	HCl	40 mL	No	NWTPH-Dx w/o SGC	
	2	VOA	--	40 mL	No	PAHs 8270 SIM	
	2	Amber	--	100 mL	No	OMP Cresols 8270	
	2	VOA	HCl	40 mL	No	Methane RSK 175	
	1	HDPE	H2SO4	125 mL	No	Ammonia	
	1	HDPE	H2SO4	250 mL	No	Nitrate-Nitrite	
	1	HDPE	none	125 mL	No	Sulfate	
	1	HDPE	NaOH/ZnAc	125 mL	No	Sulfide	
	1	HDPE	HNO3	250 mL	No	Tot. Metals (Pb)	
	1	HDPE	HNO3	250 mL	Yes	Dis. Metals (Pb, Mn, Fe)	
Total	18						

Time	1130	1135	1140	1145	1150			
Parameter (every 5 min)	5 min	10 min	15 min	20 min	25 min	min	min	min
Flow Rate (L/min)	0.1							
Volume Purged (Liters)	0.5	1.0	1.5	2.0	2.5			
Water Depth (ft)	11.57	11.59	11.59	11.59	11.59			
Temperature (°C), (± 0.2)	19.03	18.89	18.61	18.66	18.55			
pH, (± 0.1)	7.79	7.75	7.74	7.74	7.73			
Sp. Conductance (µS/cm), (± 3%)	0.706	0.702	0.704	0.703	0.706			
DO (mg/L), (± 10% or 10% of 0.2mg/l)	3.31	2.80	3.25	3.10	3.38			
ORP (mV), (± 10%)	92.6	90.7	95.0	99.0	102.2			
Turbidity (NTU), (± 10% or 3 < 10 NTUs)	1.65	1.58	1.78	1.90	1.80			
Color	clear							
Odor/Evidence of LNAPL	no							

Notes: (i.e. actions taken if well dewater, difficulties in sampling through LNAPL, problems during purging/sampling, etc.)

1 US Gallon = 3.8 Liters.

Groundwater Purge and Sample Form (Minimal Drawdown)

Kennedy/Jenks Consultants

Date: 9-19-17
 Project Name: BNSF Wishram
 Project Number: 1796120*00
 Sampling Personnel: Robinson
 Water Level Meter: Solinst OWI
 Purging Equipment: Peristaltic Pump, Tubing
 Sampling Equipment: Peristaltic Pump, Tubing
 Sampling Time: 9:00
 Total Discharge (gal): _____
 Water Disposal: On-Site 55-gallon drums

Well Number: WMW-14
 Monument Type: Stickup (ft PVC) Flush: X
 Well Diameter (in): 2
 Well Condition: _____
 Total Casing Depth (ft): 30.0
 Screened Interval (ft): 12-27
 Purge Depth (ft): 20.0
 Depth to Groundwater (ft): 15.17
 Depth to LNAPL (ft): _____
 Water Column (ft): _____

Weather: cloudy

Water Quality Meter(s)	Model	Calibration Date/Time	QA/QC Samples		
Temp/pH/SC/ORP/DO:	YSI 556		Type	Sample ID	Time
Turbidity:	Micro TPI				
Other:					

Sample ID	Sample Containers				Field Filtered	Analysis Requested	MS/MSD & Comments
	No.	Type	Pres.	Vol.			
	2	VOA	HCl	40 mL	No	BTEX 8260	
	2	VOA	HCl	40 mL	No	NWTPH-Gx	
	2	VOA	HCl	40 mL	No	NWTPH-Dx w/o SGC	
		VOA	--	40 mL	No	PAHs 8270 SIM	
		Amber	--	100 mL	No	OMP Cresols 8270	
	2	VOA	HCl	40 mL	No	Methane RSK 175	
	1	HDPE	H2SO4	125 mL	No	Ammonia (350.1)	
	1	HDPE	H2SO4	250 mL	No	Nitrate-Nitrite (353.2)	
	1	HDPE	none	125 mL	No	Sulfate (300.0)	
	1	HDPE	NaOH/ZnAc	125 mL	No	Sulfide (376.2)	
	1	HDPE	HNO3	250 mL	No	Tot. Metals (Pb)	
	1	HDPE	HNO3	250 mL	Yes	Dis. Metals (Pb, Mn, Fe)	

Total 14

Time	6:50	8:55	8:9:00					
Parameter (every 5 min)	min	min	min	min	min	min	min	min
Flow Rate (L/min)	~.2	~.2	~.2					
Volume Purged (Liters)	~.24	~.24	~.23					
Water Depth (ft)	15.23	15.24	15.24					
Temperature (°C), (± 0.2)	16.42	16.93	16.67					
pH, (± 0.1)	9.30	7.84	7.83					
Sp. Conductance (uS/cm), (± 3%)	586	601	612					
DO (mg/L), (± 10% or 10% of 0.2mg/l)	2.95	2.56	2.37					
ORP (mV), (± 10%)	174.7	182.1	187.6					
Turbidity (NTU), (± 10% or 3 <10 NTUs)	1.77	1.48	0.65					
Color	clear	clear	clear					
Odor/Evidence of LNAPL	none	none	none					

Notes: (i.e. actions taken if well dewaterers, difficulties in sampling through LNAPL, problems during purging/sampling, etc.)

1 US Gallon = 3.8 Liters. switched to stand alone probe for pH after first timepoint

Groundwater Purge and Sample Form (Minimal Drawdown)

Kennedy/Jenks Consultants

Date: 9-19-17
 Project Name: BNSF Wishram
 Project Number: 1796120*00
 Sampling Personnel: Robinson
 Water Level Meter: Solinst OWI
 Purging Equipment: Peristaltic Pump, Tubing
 Sampling Equipment: Peristaltic Pump, Tubing
 Sampling Time: 10:45
 Total Discharge (gal): _____
 Water Disposal: On-Site 55-gallon drums

Well Number: WMW-15
 Monument Type: Stickup (ft PVC) Flush: X
 Well Diameter (in): 2
 Well Condition: _____
 Total Casing Depth (ft): 30.0
 Screened Interval (ft): 12-27
 Purge Depth (ft): 20.0
 Depth to Groundwater (ft): 15.0'
 Depth to LNAPL (ft): —
 Water Column (ft): _____

TOC

Weather: _____

Water Quality Meter(s)	Model	Calibration Date/Time	QA/QC Samples		
Temp/pH/SC/ORP/DO:	YSI 556		Type	Sample ID	Time
Turbidity:	Micro TPI				
Other:					

Sample ID	Sample Containers				Field Filtered	Analysis Requested	MS/MSD & Comments
	No.	Type	Pres.	Vol.			
	2	VOA	HCl	40 mL	No	BTEX 8260	
	2	VOA	HCl	40 mL	No	NWTPH-Gx	
	2	VOA	HCl	40 mL	No	NWTPH-Dx w/o SGC	
		VOA	--	40 mL	No	PAHs 8270 SIM	
		Amber	--	100 mL	No	OMP Cresols 8270	
	2	VOA	HCl	40 mL	No	Methane RSK 175	
	1	HDPE	H2SO4	125 mL	No	Ammonia (350.1)	
	1	HDPE	H2SO4	250 mL	No	Nitrate-Nitrite (353.2)	
	1	HDPE	none	125 mL	No	Sulfate (300.0)	
	1	HDPE	NaOH/ZnAc	125 mL	No	Sulfide (376.2)	
	1	HDPE	HNO3	250 mL	No	Tot. Metals (Pb)	
	1	HDPE	HNO3	250 mL	Yes	Dis. Metals (Pb, Mn, Fe)	

Total 14

	Time	10:35	10:40	10:45					
Parameter (every 5 min)		min	min	min	min	min	min	min	min
Flow Rate (L/min)		~.2	~.2	~.2					
Volume Purged (Liters)		~2	~2	~3					
Water Depth (ft)		19.13	19.13	16.13					
Temperature (°C), (± 0.2)		17.34	17.37	17.35					
pH, (± 0.1)		7.30	7.27	7.27					
Sp. Conductance (uS/cm), (± 3%)		828	852	858					
DO (mg/L), (± 10% or 10% of 0.2mg/l)		2.01	0.37	0.33					
ORP (mV), (± 10%)		225.3	230.6	233.3					
Turbidity (NTU), (± 10% or 3 <10 NTUs)		14.88	2.77	6.90					
Color		clear	clear	→					
Odor/Evidence of LNAPL		Yield	→	→					

Notes: (i.e. actions taken if well dewatered, difficulties in sampling through LNAPL, problems during purging/sampling, etc.)

1 US Gallon = 3.8 Liters.

Groundwater Purge and Sample Form (Minimal Drawdown)

Kennedy/Jenks Consultants

Date: 9-19-17
 Project Name: BNSF Wishram
 Project Number: 1796120*00
 Sampling Personnel: Robinson
 Water Level Meter: Solinst OWI
 Purging Equipment: Peristaltic Pump, Tubing
 Sampling Equipment: Peristaltic Pump, Tubing
 Sampling Time: 14:26
 Total Discharge (gal): _____
 Water Disposal: On-Site 55-gallon drums

Well Number: WMW-16
 Monument Type: Stickup (ft PVC) Flush: X
 Well Diameter (in): 2
 Well Condition: _____
 Total Casing Depth (ft): 30.0
 Screened Interval (ft): 11.33-26.33
 Purge Depth (ft): 20.0
 Depth to Groundwater (ft): 14.74
 Depth to LNAPL (ft): _____
 Water Column (ft): _____

TOC

Weather: light rain

Water Quality Meter(s)	Model	Calibration Date/Time	QA/QC Samples		
Temp/pH/SC/ORP/DO:	YSI 556		Type	Sample ID	Time
Turbidity:	Micro TPI				
Other:					

Sample ID	Sample Containers				Field Filtered	Analysis Requested	MS/MSD & Comments
	No.	Type	Pres.	Vol.			
	2	VOA	HCl	40 mL	No	BTEX 8260	
	2	VOA	HCl	40 mL	No	NWTPH-Gx	
	2	VOA	HCl	40 mL	No	NWTPH-Dx w/o SGC	
	2	VOA	--	40 mL	No	PAHs 8270 SIM	
	2	Amber	--	100 mL	No	OMP Cresols 8270	
	2	VOA	HCl	40 mL	No	Methane RSK 175	
	1	HDPE	H2SO4	125 mL	No	Ammonia	
	1	HDPE	H2SO4	250 mL	No	Nitrate-Nitrite	
	1	HDPE	none	125 mL	No	Sulfate	
	1	HDPE	NaOH/ZnAc	125 mL	No	Sulfide	
	1	HDPE	HNO3	250 mL	No	Tot. Metals (Pb)	
	1	HDPE	HNO3	250 mL	Yes	Dis. Metals (Pb, Mn, Fe)	
Total	18						

	Time	2:11	2:16	2:21	2:26				
Parameter (every 5 min)		min	min	min	min	min	min	min	min
Flow Rate (L/min)		~.2	~.2	~.2	~.2				
Volume Purged (Liters)		~1	~2	~3	~4				
Water Depth (ft)		14.79	14.80	14.80	14.90				
Temperature (°C), (± 0.2)		18.48	18.40	18.32	18.53				
pH, (± 0.1)		6.76	6.76	6.76	6.76				
Sp. Conductance (uS/cm), (± 3%)		503	512	528	533				
DO (mg/L), (± 10% or 10% of 0.2mg/l)		1.31	0.66	0.36	0.21				
ORP (mV), (± 10%)		157.4	152.0	155.7	151.5				
Turbidity (NTU), (± 10% or 3 < 10 NTUs)		7.69	4.97	2.84	2.51				
Color		none	none	none	none				
Odor/Evidence of LNAPL									

Notes: (i.e. actions taken if well dewateres, difficulties in sampling through LNAPL, problems during purging/sampling, etc.)

1 US Gallon = 3.8 Liters.

Groundwater Purge and Sample Form (Minimal Drawdown)

Kennedy/Jenks Consultants

Date: 9-20-17
 Project Name: BNSF Wishram
 Project Number: 1796120*00
 Sampling Personnel: Rehman
 Water Level Meter: Solinst OWI
 Purging Equipment: Peristaltic Pump, Tubing
 Sampling Equipment: Peristaltic Pump, Tubing
 Sampling Time: 18:25
 Total Discharge (gal): _____
 Water Disposal: On-Site 55-gallon drums

Well Number: WMW-17
 Monument Type: Stickup: _____ (ft PVC) Flush:
 Well Diameter (in): 2
 Well Condition: _____
 Total Casing Depth (ft): 30.0
 Screened Interval (ft): 12-27
 Purge Depth (ft): 20.0
 Depth to Groundwater (ft): 14.28'
 Depth to LNAPL (ft): _____
 Water Column (ft): _____

TOC

Weather: _____

Water Quality Meter(s)	Model	Calibration Date/Time	QA/QC Samples		
Temp/pH/SC/ORP/DO:	YSI 556		Type	Sample ID	Time
Turbidity:	Micro TPI		Duplicate	D-1-201709 <u>10</u>	--
Other:					

Sample ID	Sample Containers				Field Filtered	Analysis Requested	MS/MSD & Comments
	No.	Type	Pres.	Vol.			
	2	VOA	HCl	40 mL	No	BTEX 8260	
	2	VOA	HCl	40 mL	No	NWTPH-Gx	
	2	VOA	HCl	40 mL	No	NWTPH-Dx w/o SGC	
	2	VOA	--	40 mL	No	PAHs 8270 SIM	
		Amber	--	100 mL	No	OMP Cresols 8270	
	2	VOA	HCl	40 mL	No	Methane RSK 175	
	1	HDPE	H2SO4	125 mL	No	Ammonia	
	1	HDPE	H2SO4	250 mL	No	Nitrate-Nitrite	
	1	HDPE	none	125 mL	No	Sulfate	
	1	HDPE	NaOH/ZnAc	125 mL	No	Sulfide	
	1	HDPE	HNO3	250 mL	No	Tot. Metals (Pb, As)	
	1	HDPE	HNO3	250 mL	Yes	Dis. Metals (Pb,As,Mn,Fe)	
Total	16						

Parameter (every 5 min)	Time	6:13	6:18	6:23					
		min	min	min	min	min	min	min	min
Flow Rate (L/min)		~.2	~.2	~.2					
Volume Purged (Liters)		1	2	3					
Water Depth (ft)		14.30	14.30	14.30					
Temperature (°C), (± 0.2)		17.17	17.22	17.17					
pH, (± 0.1)		7.02	6.99	6.99					
Sp. Conductance (uS/cm), (± 3%)		690	634	620					
DO (mg/L), (± 10% or 10% of 0.2mg/l)		0.83	0.35	0.30					
ORP (mV), (± 10%)		-141.5	-161.4	-170.6					
Turbidity (NTU), (± 10% or 3 <10 NTUs)		29.09	5.24	1.04					
Color		particly white	clear	clear					
Odor/Evidence of LNAPL		H2S odor	odor	odor					

Notes: (i.e. actions taken if well dewaterers, difficulties in sampling through LNAPL, problems during purging/sampling, etc.)

1 US Gallon = 3.8 Liters.

Groundwater Purge and Sample Form (Minimal Drawdown)

Kennedy/Jenks Consultants

Date: 9/20/17 Well Number: WMW-18
 Project Name: BNSF Wishram Monument Type: Stickup: (ft PVC) Flush: X
 Project Number: 1796120*00 Well Diameter (in): 2
 Sampling Personnel: _____ Well Condition: good
 Water Level Meter: Solinst OWI Total Casing Depth (ft): 30.0
 Purging Equipment: Peristaltic Pump, Tubing Screened Interval (ft): 12-27
 Sampling Equipment: Peristaltic Pump, Tubing Purge Depth (ft): 20.0
 Sampling Time: 1510 AD Depth to Groundwater (ft): _____ **TOC**
 Total Discharge (gal): _____ Depth to LNAPL (ft): _____
 Water Disposal: On-Site 55-gallon drums Water Column (ft): _____
 Weather: _____

Water Quality Meter(s)	Model	Calibration Date/Time	QA/QC Samples		
Temp/pH/SC/ORP/DO:	YSI 556		Type	Sample ID	Time
Turbidity:	Micro TPI		MS	WMW-18-201709 ₂₀ MS	1515
Other:			MSD	WMW-18-201709 ₂₀ MSD	1510

Sample ID	Sample Containers				Field Filtered	Analysis Requested	MS/MSD & Comments
	No.	Type	Pres.	Vol.			
	2	VOA	HCl	40 mL	No	BTEX 8260	
	2	VOA	HCl	40 mL	No	NWTPH-Gx	
	2	VOA	HCl	40 mL	No	NWTPH-Dx w/o SGC	
	2	VOA	--	40 mL	No	PAHs 8270 SIM	
	2	Amber	--	100 mL	No	OMP Cresols 8270	
	2	VOA	HCl	40 mL	No	Methane RSK 175	
	1	HDPE	H2SO4	125 mL	No	Ammonia	
	1	HDPE	H2SO4	250 mL	No	Nitrate-Nitrite	
	1	HDPE	none	125 mL	No	Sulfate	
	1	HDPE	NaOH/ZnAc	125 mL	No	Sulfide	
	1	HDPE	HNO3	250 mL	No	Tot. Metals (Pb,As)	
	1	HDPE	HNO3	250 mL	Yes	Dis. Metals (Pb,As,Mn,Fe)	
Total	18						

Parameter (every 5 min)	Time	1435	1440	1445	1450	1455	# 1500	1505	
		5 min	10 min	15 min	20 min	25 min	30 min	35 min	min
Flow Rate (L/min)	1430	0.1							
Volume Purged (Liters)		0.5	1.0	1.5	2.0	2.5	3.0	3.5	
Water Depth (ft)		14.61	14.61	16.64	14.62	14.64	14.64	14.64	
Temperature (°C), (± 0.2)		16.09	16.59	14.61	16.53	16.55	16.54	16.51	
pH, (± 0.1)		7.65	7.46	7.42	7.41	7.41	7.40	7.40	
Sp. Conductance (uS/cm), (± 3%)		0.635	0.624	0.621	0.621	0.620	0.619	0.619	
DO (mg/L), (± 10% or 10% of 0.2mg/l)		1.56	0.37	0.23	0.23	0.27	0.28	0.30	
ORP (mV), (± 10%)		93.4	95.8	95.6	94.5	93.9	94.9	95.8	
Turbidity (NTU), (± 10% or 3 <10 NTUs)		5.97	9.52	102.0	42.11	10.58	5.01	2.64	
Color		clear		cloudy		clear			
Odor/Evidence of LNAPL		no O/S							

Notes: (i.e. actions taken if well dewateres, difficulties in sampling through LNAPL, problems during purging/sampling, etc.)

1 US Gallon = 3.8 Liters.

FIELD FORM

**WATER TABLE/LNAPL THICKNESS MEASUREMENTS
BNSF WISHRAM**

Monitoring Personnel:		AR/KET			
Well	Date / Time	Depth to LNAPL (ft bgs)	Depth to Water (ft bgs)	LNAPL Thickness (ft)	Well Status
RMD-1	14:43	--	14.82	--	
RMD-2	14:52	--	14.57	--	
RMD-3	14:57	--	14.85	--	
RMD-4	15:06	--	14.70	--	
WMW-1	14:48	--	10.27	--	
WMW-3	14:22	--	10.68	--	
WMW-5	14:28	--	10.20	--	
WMW-7	13:30	--	11.78	--	
WMW-8	13:37	--	11.41	--	
WMW-9	14:11	--	10.94	--	
WMW-10	14:39	--	10.86	--	
WMW-11	14:56	--	10.77	--	
WMW-12	13:48	--	11.10	--	
WMW-13	14:04	--	11.41	--	
WMW-14	14:35	--	15.09	--	
WMW-15	14:40	--	14.93	--	
WMW-16	14:49	--	14.62	--	
WMW-17	14:54	--	14.64	--	
WMW-18	15:01	--	14.67	--	

28 to 30 November 2017

Groundwater Purge and Sample Form (Minimal Drawdown)

Kennedy/Jenks Consultants

Date: _____
 Project Name: BNSF Wishram
 Project Number: 1796120*00

Well Number: WMW-14
 Monument Type: Stickup (ft PVC) Flush: X
 Well Diameter (in): 2

Sampling Personnel: Sandberg
 Water Level Meter: Solinst OWI
 Purging Equipment: Peristaltic Pump, Tubing
 Sampling Equipment: Peristaltic Pump, Tubing

Well Condition: good
 Total Casing Depth (ft): 30.0
 Screened Interval (ft): 12-27
 Purge Depth (ft): 20.0

Sampling Time: 11:15
 Total Discharge (gal): ~1.5 gal

Depth to Groundwater (ft): 15.29
 Depth to LNAPL (ft): -

Water Disposal: On-Site 55-gallon drums

Water Column (ft): 14.71

Weather: Overcast

Water Quality Meter(s)	Model	Calibration Date/Time	QA/QC Samples		
Temp/pH/SC/ORP/DO:	YSI 556		Type	Sample ID	Time
Turbidity:	Micro TPI				
Other:					

Sample ID	Sample Containers				Field Filtered	Analysis Requested	MS/MSD & Comments
	No.	Type	Pres.	Vol.			
	2	VOA	HCl	40 mL	No	NWTPH-Dx w/o SGC	
	2	VOA	HCl	40 mL	No	Methane RSK 175	
	1	HDPE	H2SO4	125 mL	No	Ammonia (350.1)	
	1	HDPE	H2SO4	250 mL	No	Nitrate-Nitrite (353.2)	
	1	HDPE	none	125 mL	No	Sulfate (300.0)	
	1	HDPE	NaOH/ZnAc	125 mL	No	Sulfide (376.2)	
	1	HDPE	HNO3	250 mL	Yes	Dis.Metals (Mn,Fe)	

Total 9

Time	1430	1435	1440	1445				
Parameter (every 5 min)	min	min	min	min	min	min	min	min
Flow Rate (L/min)	0.25							
Volume Purged (Liters)	1.25	2.5	3.75	5				
Water Depth (ft)	15.28	15.28	15.28	15.29				
Temperature (°C), (± 0.2)	15.75	16.09	16.17					
pH, (± 0.1)	7.81	7.79	7.78					
Sp. Conductance (uS/cm), (± 3%)	640	642	642					
DO (mg/L), (± 10% or 10% of 0.2mg/l)	1.96	1.76	1.60					
ORP (mV), (± 10%)	73.7	77.3	79.3					
Turbidity (NTU), (± 10% or 3 <10 NTUs)	14.44	20.81	16.37					
Color	Clear	Clear	Clear					
Odor/Evidence of LNAPL	NONE	NONE	NONE					

Notes: (i.e. actions taken if well dewater, difficulties in sampling through LNAPL, problems during purging/sampling, etc.)

1 US Gallon = 3.8 Liters.

10.15
G DTD DTM-2

Groundwater Purge and Sample Form (Minimal Drawdown)

Kennedy/Jenks Consultants

Date: 11/30 Well Number: WMW-15
 Project Name: BNSF Wishram Monument Type: Stickup (ft PVC) Flush: X
 Project Number: 1796120*00 Well Diameter (in): 2
 Sampling Personnel: Sunday Well Condition: 4-2
 Water Level Meter: Solinst OWI Total Casing Depth (ft): 30.0
 Purging Equipment: Peristaltic Pump, Tubing Screened Interval (ft): 12-27
 Sampling Equipment: Peristaltic Pump, Tubing Purge Depth (ft): 20.0
 Sampling Time: 1335 Depth to Groundwater (ft): 15.05
 Total Discharge (gal): ~2 gal Depth to LNAPL (ft): —
 Water Disposal: On-Site 55-gallon drums Water Column (ft): 14.95

Weather: _____

TOC

Water Quality Meter(s)	Model	Calibration Date/Time	QA/QC Samples		
Temp/pH/SC/ORP/DO:	YSI 556		Type	Sample ID	Time
Turbidity:	Micro TPI				
Other:					

Sample ID	Sample Containers				Field Filtered	Analysis Requested	MS/MSD & Comments
	No.	Type	Pres.	Vol.			
	2	VOA	HCl	40 mL	No	NWTPH-Dx w/o SGC	
	2	VOA	HCl	40 mL	No	Methane RSK 175	
	1	HDPE	H2SO4	125 mL	No	Ammonia (350.1)	
	1	HDPE	H2SO4	250 mL	No	Nitrate-Nitrite (353.2)	
	1	HDPE	none	125 mL	No	Sulfate (300.0)	
	1	HDPE	NaOH/ZnAc	125 mL	No	Sulfide (376.2)	
	1	HDPE	HNO3	250 mL	Yes	Dis. Metals (Mn,Fe)	
Total		9					

Parameter (every 5 min)	Time	1316	1321	1326	1331				
	min	min	min	min	min	min	min	min	min
Flow Rate (L/min)	0.25								
Volume Purged (Liters)	1.25	2.5	3.75	5					
Water Depth (ft)	15.14	15.14	15.14	15.14					
Temperature (°C), (± 0.2)	15.66	15.78	15.83	15.76					
pH, (± 0.1)	7.23	7.23	7.23	7.23					
Sp. Conductance (uS/cm), (± 3%)	924	944	949	946					
DO (mg/L), (± 10% or 10% of 0.2mg/l)	0.64	0.43	0.36	0.36					
ORP (mV), (± 10%)	7.14	-90.2	-108.7	-111.4					
Turbidity (NTU), (± 10% or 3 <10 NTUs)	25.67	21.78	22.75	23.67					
Color	clear	clear	clear	clear					
Odor/Evidence of LNAPL	none	none	none	none					

Notes: (i.e. actions taken if well dewatered, difficulties in sampling through LNAPL, problems during purging/sampling, etc.)
 1 US Gallon = 3.8 Liters.

Groundwater Purge and Sample Form (Minimal Drawdown)

Kennedy/Jenks Consultants

Date: 11/30
 Project Name: BNSF Wishram
 Project Number: 1796120*00
 Sampling Personnel: [Signature]
 Water Level Meter: Solinst OWI
 Purging Equipment: Peristaltic Pump, Tubing
 Sampling Equipment: Peristaltic Pump, Tubing
 Sampling Time: 1140
 Total Discharge (gal): _____
 Water Disposal: On-Site 55-gallon drums

Well Number: WMW-16
 Monument Type: Stickup (ft PVC) Flush: X
 Well Diameter (in): 2
 Well Condition: Good
 Total Casing Depth (ft): 30.0
 Screened Interval (ft): 11.33-26.33
 Purge Depth (ft): 20.0
 Depth to Groundwater (ft): 14.82
 Depth to LNAPL (ft): +
 Water Column (ft): 15.18

TOC

Weather: _____

Water Quality Meter(s)	Model	Calibration Date/Time	QA/QC Samples		
Temp/pH/SC/ORP/DO:	YSI 556		Type	Sample ID	Time
Turbidity:	Micro TPI				
Other:					

Sample ID	Sample Containers				Field Filtered	Analysis Requested	MS/MSD & Comments
	No.	Type	Pres.	Vol.			
	2	VOA	HCl	40 mL	No	NWTPH-Gx	
	2	VOA	HCl	40 mL	No	NWTPH-Dx w/o SGC	
	2	VOA	--	40 mL	No	PAHs 8270 SIM	
	2	VOA	HCl	40 mL	No	Methane RSK 175	
	1	HDPE	H2SO4	125 mL	No	Ammonia	
	1	HDPE	H2SO4	250 mL	No	Nitrate-Nitrite	
	1	HDPE	none	125 mL	No	Sulfate	
	1	HDPE	NaOH/ZnAc	125 mL	No	Sulfide	
	1	HDPE	HNO3	250 mL	Yes	Dis. Metals (Mn, Fe)	

Total 13

Parameter (every 5 min)	Time	1123	1128	1133					
		5 min	5 min	5 min	min	min	min	min	min
Flow Rate (L/min)		0.25	→						
Volume Purged (Liters)		1.25	2.5	3.75					
Water Depth (ft)		14.64	14.65	14.65	14.85				
Temperature (°C), (± 0.2)		16.68	16.81	16.91	16.91				
pH, (± 0.1)		6.89	6.91	6.90	6.90				
Sp. Conductance (uS/cm), (± 3%)		732	736	731	734				
DO (mg/L), (± 10% or 10% of 0.2mg/l)		2.32	0.47	0.36	0.33				
ORP (mV), (± 10%)		-112.9	-129.5	-134.0	-135.2				
Turbidity (NTU), (± 10% or 3 < 10 NTUs)		6.53	6.05	4.43	4.49				
Color		clear	clear	clear	clear				
Odor/Evidence of LNAPL		diethyl	diethyl						

Notes: (i.e. actions taken if well dewater, difficulties in sampling through LNAPL, problems during purging/sampling, etc.)

1 US Gallon = 3.8 Liters.

Groundwater Purge and Sample Form (Minimal Drawdown)

Kennedy/Jenks Consultants

Date: 11/30
 Project Name: BNSF Wishram
 Project Number: 1796120*00
 Sampling Personnel: Sambury
 Water Level Meter: Solinst OWI
 Purging Equipment: Peristaltic Pump, Tubing
 Sampling Equipment: Peristaltic Pump, Tubing
 Sampling Time: _____
 Total Discharge (gal): _____
 Water Disposal: On-Site 55-gallon drums

Well Number: WMW-17
 Monument Type: Stickup: _____ (ft PVC) Flush: X
 Well Diameter (in): 2
 Well Condition: good
 Total Casing Depth (ft): 30.0
 Screened Interval (ft): 12-27
 Purge Depth (ft): 20.0
 Depth to Groundwater (ft): 14.80
 Depth to LNAPL (ft): -
 Water Column (ft): 15.20

Weather: Overcast / Windy

Water Quality Meter(s)	Model	Calibration Date/Time	QA/QC Samples		
Temp/pH/SC/ORP/DO:	YSI 556		Type	Sample ID	Time
Turbidity:	Micro TPI		Duplicate	D-1-201709	-
Other:					

Sample ID	Sample Containers				Field Filtered	Analysis Requested	MS/MSD & Comments
	No.	Type	Pres.	Vol.			
WAW-10 (20171130)	2	VOA	HCl	40 mL	No	NWTPH-Gx	
	2	VOA	HCl	40 mL	No	NWTPH-Dx w/o SGC	
	2	VOA	HCl	40 mL	No	Methane RSK 175	
	1	HDPE	H2SO4	125 mL	No	Ammonia	
	1	HDPE	H2SO4	250 mL	No	Nitrate-Nitrite	
	1	HDPE	none	125 mL	No	Sulfate	
	1	HDPE	NaOH/ZnAc	125 mL	No	Sulfide	
	1	HDPE	HNO3	250 mL	No	Tot. Metals (As)	
	1	HDPE	HNO3	250 mL	Yes	Dis. Metals (As, Mn, Fe)	
	Total		12				

Parameter (every 5 min)	Time	10:15	10:20	10:25	10:30				
Flow Rate (L/min)		0.25							
Volume Purged (Liters)		1.25	2.5	3.74	5				
Water Depth (ft)		14.83	14.82	14.82					
Temperature (°C), (± 0.2)		15.41	15.74	15.91	15.93				
pH, (± 0.1)		7.12	7.11	7.11	7.11				
Sp. Conductance (uS/cm), (± 3%)		955	879	863	839				
DO (mg/L), (± 10% or 10% of 0.2mg/l)		1.16	0.53	0.42	0.45				
ORP (mV), (± 10%)		-128.5	-141.6	-143.8	-146.7				
Turbidity (NTU), (± 10% or 3 < 10 NTUs)		12.34	6.71	4.17	3.94				
Color		clear	clear	clear	clear				
Odor/Evidence of LNAPL		sulfur like	none	none	none				

Notes: (i.e. actions taken if well dewater, difficulties in sampling through LNAPL, problems during purging/sampling, etc.)
 1 US Gallon = 3.8 Liters.

Groundwater Purge and Sample Form (Minimal Drawdown)

Kennedy/Jenks Consultants

Date: _____
 Project Name: BNSF Wishram
 Project Number: 1796120*00
 Sampling Personnel: Sawberg
 Water Level Meter: Solinst OWI
 Purging Equipment: Peristaltic Pump, Tubing
 Sampling Equipment: Peristaltic Pump, Tubing
 Sampling Time: 1520
 Total Discharge (gal): _____
 Water Disposal: On-Site 55-gallon drums

Well Number: WMW-18
 Monument Type: Stickup: _____ (ft PVC) Flush: X
 Well Diameter (in): 2
 Well Condition: good
 Total Casing Depth (ft): 30.0
 Screened Interval (ft): 12-27
 Purge Depth (ft): 20.0
 Depth to Groundwater (ft): 14.73
 Depth to LNAPL (ft): -
 Water Column (ft): 15.27

TOC

Weather: _____

Water Quality Meter(s)	Model	Calibration Date/Time	QA/QC Samples		
Temp/pH/SC/ORP/DO:	YSI 556		Type	Sample ID	Time
Turbidity:	Micro TPI		MS	WMW-18-201709_MS	
Other:			MSD	WMW-18-201709_MSD	

Sample ID	Sample Containers				Field Filtered	Analysis Requested	MS/MSD & Comments
	No.	Type	Pres.	Vol.			
	2	VOA	HCl	40 mL	No	NWTPH-Dx w/o SGC ~	
	2	VOA	HCl	40 mL	No	Methane RSK 175 ~	
	1	HDPE	H2SO4	125 mL	No	Ammonia ~	
	1	HDPE	H2SO4	250 mL	No	Nitrate-Nitrite ~	
	1	HDPE	none	125 mL	No	Sulfate ~	
	1	HDPE	NaOH/ZnAc	125 mL	No	Sulfide ~	
	1	HDPE	HNO3	250 mL	No	Tot. Metals (As) ~	
	1	HDPE	HNO3	250 mL	Yes	Dis. Metals (As, Mn, Fe) ~	

Total 10

Time	1503	1506	1513	1518				
Parameter (every 5 min)	min	min	min	min	min	min	min	min
Flow Rate (L/min)	0.20							
Volume Purged (Liters)	~1	~2	~3	~4				
Water Depth (ft)	14.76	14.77	14.77	14.77				
Temperature (°C), (± 0.2)	16.22	16.31	16.33	16.36				
pH, (± 0.1)	7.27	7.33	7.34	7.36				
Sp. Conductance (uS/cm), (± 3%)	616	616	616	615				
DO (mg/L), (± 10% or 10% of 0.2mg/l)	1.29	0.56	0.53	0.41				
ORP (mV), (± 10%)	252.2	257.3	235.0	226				
Turbidity (NTU), (± 10% or 3 <10 NTUs)	6.23	3.40	-	3.12				
Color	clear	clear	clear	clear				
Odor/Evidence of LNAPL	none	N/A	N/A	N/A				

Notes: (i.e. actions taken if well dewater, difficulties in sampling through LNAPL, problems during purging/sampling, etc.)

1 US Gallon = 3.8 Liters.

FIELD FORM

WATER TABLE/LNAPL THICKNESS MEASUREMENTS
BNSF WISHRAM

Monitoring Personnel:					
Well	Date / Time	Depth to LNAPL (ft btoc)	Depth to Water (ft btoc)	LNAPL Thickness (ft)	Well Status
OHM-1	1615	9.55	28.18	18.64	good
OHM-2	11/30/15	10.12	15.88	5.76	good
OHM-3	1330	10.26	14.12	3.86	good
OHM-4	1343	—	11.20	—	good
RMD-1	1302	—	14.75	—	good ↓
RMD-2	1313	—	14.52	—	
RMD-3	1407	—	14.85	—	
RMD-4	1416	—	14.68	—	
WMW-1	1250	—	10.26	—	good
WMW-3	1222	—	10.63	—	1 Bolt - stripped 2. minimum below grade
WMW-5	1230	—	10.20	—	good
WMW-7	11/29 0920	—	11.74	—	2 Stripped bolts
WMW-8	↓ 1008	Sween	11.50	Sween	good
WMW-9	10/5 1144	—	10.85	—	good
WMW-10	1200	—	10.88	—	good
WMW-11	1208	—	10.79	—	good - missing 1 bolt
WMW-12	1030	—	10.89	—	good
WMW-13	1149	—	11.35	—	good
WMW-14	1255	—	15.11	—	good
WMW-15	1301	—	14.97	—	good
WMW-16	1310	—	14.70	—	↓
WMW-17	1405	—	14.71	—	
WMW-18	1415	—	14.71	—	
Additional Notes:					

27 to 28 February 2018

Groundwater Purge and Sample Form (Minimal Drawdown)

Kennedy/Jenks Consultants

Date: 2-28-18
 Project Name: BNSF Wishram
 Project Number: 1896120*00
 Sampling Personnel: Robinson
 Water Level Meter: Solinst OWI
 Purging Equipment: Peristaltic Pump, Tubing
 Sampling Equipment: Peristaltic Pump, Tubing
 Sampling Time: 11:55
 Total Discharge (gal): _____
 Water Disposal: On-Site 55-gallon drums

Well Number: WMW-14
 Monument Type: Stickup: _____ (ft PVC) Flush:
 Well Diameter (in): 2
 Well Condition: good
 Total Casing Depth (ft): 30.0
 Screened Interval (ft): 12-27
 Purge Depth (ft): 20.0
 Depth to Groundwater (ft): 13.40
 Depth to LNAPL (ft): —
 Water Column (ft): _____

TOC

Weather: _____

Water Quality Meter(s)	Model	Calibration Date/Time	QA/QC Samples		
Temp/pH/SC/ORP/DO:	YSI 556	2-27-18, 1:30p	Type	Sample ID	Time
Turbidity: <u>Micro</u>	Micro TPI	↓			
Other:					

Sample ID	Sample Containers				Field Filtered	Analysis Requested	MS/MSD & Comments
	No.	Type	Pres.	Vol.			
	2	VOA	HCl	40 mL	No	NWTPH-Dx w/o SGC	
	2	VOA	HCl	40 mL	No	Methane RSK 175	
	1	HDPE	H2SO4	125 mL	No	Ammonia (350.1)	
	1	HDPE	H2SO4	250 mL	No	Nitrate-Nitrite (353.2)	
	1	HDPE	none	125 mL	No	Sulfate (300.0)	
	1	HDPE	NaOH/ZnAc	125 mL	No	Sulfide (376.2)	
	1	HDPE	HNO3	250 mL	Yes	Dis.Metals (Mn,Fe)	

Total 9

Time	11:42	11:47	11:52	11:57				
Parameter (every 5 min)	min	min	min	min	min	min	min	min
Flow Rate (L/min)	~.2	~.2	~.2	~.2				
Volume Purged (Liters)	1	2	3	4				
Water Depth (ft)	13.41	13.41	13.41	13.41				
Temperature (°C), (± 0.2)	13.34	13.83	14.17	14.24				
pH, (± 0.1)	8.09	8.07	8.05	8.05				
Sp. Conductance (uS/cm), (± 3%)	593	593	593	593				
DO (mg/L), (± 10% or 10% of 0.2mg/l)	2.74	2.07	1.91	1.84				
ORP (mV), (± 10%)	49.0	46.6	44.3	42.4				
Turbidity (NTU), (± 10% or 3 <10 NTUs)	6.33	8.34	9.88	5.09				
Color	clear	clear	clear	clear				
Odor/Evidence of LNAPL	none	none	none	none				

Notes: (i.e. actions taken if well dewater, difficulties in sampling through LNAPL, problems during purging/sampling, etc.)

1 US Gallon = 3.8 Liters.

Groundwater Purge and Sample Form (Minimal Drawdown)

Kennedy/Jenks Consultants

Date: 2-28-18 Well Number: WMW-15
 Project Name: BNSF Wishram Monument Type: Stickup: _____ (ft PVC) Flush:
 Project Number: 1896120*00 Well Diameter (in): 2
 Sampling Personnel: Robinson Well Condition: good
 Water Level Meter: Solinst OWI Total Casing Depth (ft): 30.0
 Purging Equipment: Peristaltic Pump, Tubing Screened Interval (ft): 12-27
 Sampling Equipment: Peristaltic Pump, Tubing Purge Depth (ft): 20.0
 Sampling Time: 10:25 Depth to Groundwater (ft): 15.27
 Total Discharge (gal): _____ Depth to LNAPL (ft): _____
 Water Disposal: On-Site 55-gallon drums Water Column (ft): _____
 Weather: overcast

TOC

Water Quality Meter(s)	Model	Calibration Date/Time	QA/QC Samples		
Temp/pH/SC/ORP/DO:	YSI 556		Type	Sample ID	Time
Turbidity:	Micro TPI				
Other:					

Sample ID	Sample Containers				Field Filtered	Analysis Requested	MS/MSD & Comments	
	No.	Type	Pres.	Vol.				
	2	VOA	HCl	40 mL	No	NWTPH-Dx w/o SGC		
	2	VOA	HCl	40 mL	No	Methane RSK 175		
	1	HDPE	H2SO4	125 mL	No	Ammonia (350.1)		
	1	HDPE	H2SO4	250 mL	No	Nitrate-Nitrite (353.2)		
	1	HDPE	none	125 mL	No	Sulfate (300.0)		
	1	HDPE	NaOH/ZnAc	125 mL	No	Sulfide (376.2)		
	1	HDPE	HNO3	250 mL	Yes	Dis.Metals (Mn,Fe)		
Total		9						

Parameter (every 5 min)	Time	9:57	10:02	10:07	10:12	10:17	10:22		
	min	min	min	min	min	min	min	min	min
Flow Rate (L/min)		~.2	~.2	~.2	~.2	~.2	~.2		
Volume Purged (Liters)		1	2	3	4	5	6		
Water Depth (ft)		15.33	15.34	15.34	15.34	15.34	15.34		
Temperature (°C), (± 0.2)		14.34	14.60	14.57	14.62	14.64	14.65		
pH, (± 0.1)		7.50	7.50	7.48	7.48	7.48	7.48		
Sp. Conductance (uS/cm), (± 3%)		853	869	890	893	893	893		
DO (mg/L), (± 10% or 10% of 0.2mg/l)		1.48	0.94	0.59	0.42	0.38	0.37		
ORP (mV), (± 10%)		-44.5	-63.1	-119.0	-118.1	-117.7	-119.6		
Turbidity (NTU), (± 10% or 3 <10 NTUs)		29.43	32.49	21.67	19.97	11.51	12.18		
Color		white particles →	→	→	→	→	→		
Odor/Evidence of LNAPL		none	none	none	none	none	none		

Notes: (i.e. actions taken if well dewaterers, difficulties in sampling through LNAPL, problems during purging/sampling, etc.)
 1 US Gallon = 3.8 Liters.

Groundwater Purge and Sample Form (Minimal Drawdown)

Kennedy/Jenks Consultants

Date: 2-28-18 Well Number: WMW-16
 Project Name: BNSF Wishram Monument Type: Stickup: _____ (ft PVC) Flush:
 Project Number: 1896120*00 Well Diameter (in): 2
 Sampling Personnel: Robinson Well Condition: good
 Water Level Meter: Solinst OWI Total Casing Depth (ft): 30.0
 Purging Equipment: Peristaltic Pump, Tubing Screened Interval (ft): 11.33-26.33
 Sampling Equipment: Peristaltic Pump, Tubing Purge Depth (ft): 20.0
 Sampling Time: 9:00 Depth to Groundwater (ft): 14.89
 Total Discharge (gal): _____ Depth to LNAPL (ft): -
 Water Disposal: On-Site 55-gallon drums Water Column (ft): _____
 Weather: overcast

TOC

Water Quality Meter(s)	Model	Calibration Date/Time	QA/QC Samples		
Temp/pH/SC/ORP/DO:	YSI 556	2-27-18 1:30p	Type	Sample ID	Time
Turbidity:	Micro TPI	2-27-18 1:30p			
Other:					

Sample ID	Sample Containers				Field Filtered	Analysis Requested	MS/MSD & Comments
	No.	Type	Pres.	Vol.			
	2	VOA	HCl	40 mL	No	NWTPH-Gx	
	2	VOA	HCl	40 mL	No	NWTPH-Dx w/o SGC	
	2	VOA	--	40 mL	No	PAHs 8270 SIM	
	2	VOA	HCl	40 mL	No	Methane RSK 175	
	1	HDPE	H2SO4	125 mL	No	Ammonia	
	1	HDPE	H2SO4	250 mL	No	Nitrate-Nitrite	
	1	HDPE	none	125 mL	No	Sulfate	
	1	HDPE	NaOH/ZnAc	125 mL	No	Sulfide	
	1	HDPE	HNO3	250 mL	Yes	Dis.Metals (Mn,Fe)	

Total 13

Time	8:41	8:46	8:51	8:56	9:01			
Parameter (every 5 min)	min	min	min	min	min	min	min	min
Flow Rate (L/min)	~.2	~.2	~.2	~.2	~.2			
Volume Purged (Liters)	1	2	3	4	5			
Water Depth (ft)	14.96	14.97	14.97	14.97	14.97			
Temperature (°C), (± 0.2)	13.02	13.46	13.81	13.81	13.82			
pH, (± 0.1)	7.07	7.22	7.22	7.21	7.20			
Sp. Conductance (uS/cm), (± 3%)	384	390	400	412	415			
DO (mg/L), (± 10% or 10% of 0.2mg/l)	1.94	1.12	0.70	0.52	0.047			
ORP (mV), (± 10%)	16.1	-61.8	-75.5	-90.8	-96.2			
Turbidity (NTU), (± 10% or 3 <10 NTUs)	11.55	1.93	2.35	1.90	2.17			
Color	clear, white particles	clear	clear	clear	clear			
Odor/Evidence of LNAPL	none	none	none	none	none			

Notes: (i.e. actions taken if well dewaterers, difficulties in sampling through LNAPL, problems during purging/sampling, etc.)

1 US Gallon = 3.8 Liters.

Groundwater Purge and Sample Form (Minimal Drawdown)

Kennedy/Jenks Consultants

Date: _____ Well Number: **WMW-17**

Project Name: **BNSF Wishram** Monument Type: _____ Stickup: _____ (ft PVC) Flush: X

Project Number: **1896120*00** Well Diameter (in): _____ 2

Sampling Personnel: **Robinson** Well Condition: **good**

Water Level Meter: **Solinst OWI** Total Casing Depth (ft): **30.0**

Purging Equipment: **Peristaltic Pump, Tubing** Screened Interval (ft): **12-27**

Sampling Equipment: **Peristaltic Pump, Tubing** Purge Depth (ft): **20.0**

Sampling Time: **16:20** Depth to Groundwater (ft): **14.74**

Total Discharge (gal): _____ Depth to LNAPL (ft): **-**

Water Disposal: **On-Site 55-gallon drums** Water Column (ft): _____

Weather: **partly cloudy**

TOC

Water Quality Meter(s)	Model	Calibration Date/Time	QA/QC Samples		
Temp/pH/SC/ORP/DO:	YSI 556		Type	Sample ID	Time
Turbidity:	Micro TPI		Duplicate	D-1-201802_27	--
Other:					

Sample ID	Sample Containers				Field Filtered	Analysis Requested	MS/MSD & Comments
	No.	Type	Pres.	Vol.			
	2	VOA	HCl	40 mL	No	NWTPH-Gx	
	2	VOA	HCl	40 mL	No	NWTPH-Dx w/o SGC	
	2	VOA	HCl	40 mL	No	Methane RSK 175	
	1	HDPE	H2SO4	125 mL	No	Ammonia	
	1	HDPE	H2SO4	250 mL	No	Nitrate-Nitrite	
	1	HDPE	none	125 mL	No	Sulfate	
	1	HDPE	NaOH/ZnAc	125 mL	No	Sulfide	
	1	HDPE	HNO3	250 mL	No	Tot. Metals (As)	
	1	HDPE	HNO3	250 mL	Yes	Dis. Metals (As, Mn, Fe)	

Total 12

Time	16:00	16:05	16:10	16:15	16:20			
Parameter (every 5 min)	min	min	min	min	min	min	min	min
Flow Rate (L/min)	~.2	~.2	~.2	~.2	~.2			
Volume Purged (Liters)	21	22	3	4	6			
Water Depth (ft)	14.83	14.84	13.27 14.85	14.85	14.85			
Temperature (°C), (± 0.2)	13.45	13.90	13.77	13.59	13.50			
pH, (± 0.1)	7.24	7.23	7.23	7.23	7.23			
Sp. Conductance (uS/cm), (± 3%)	985	902	848	782	750			
DO (mg/L), (± 10% or 10% of 0.2mg/l)	1.54	0.65	0.53	0.43	0.39			
ORP (mV), (± 10%)	-154.9	-167.8	-172.4	-168.2	-166.7			
Turbidity (NTU), (± 10% or 3 < 10 NTUs)	3.54	3.01	2.70	3.17	2.49			
Color	clear	clear	clear	clear	clear			
Odor/Evidence of LNAPL	none	mild	mild	mild	mild			

Notes: (i.e. actions taken if well dewater, difficulties in sampling through LNAPL, problems during purging/sampling, etc.)

1 US Gallon = 3.8 Liters.

Groundwater Purge and Sample Form (Minimal Drawdown)

Kennedy/Jenks Consultants

Date: 2-27-18 Well Number: WMW-18
 Project Name: BNSF Wishram Monument Type: Stickup: _____ (ft PVC) Flush:
 Project Number: 1896120*00 Well Diameter (in): 2
 Sampling Personnel: Robinson Well Condition: good
 Water Level Meter: Solinst OWI Total Casing Depth (ft): 30.0
 Purging Equipment: Peristaltic Pump, Tubing Screened Interval (ft): 12-27
 Sampling Equipment: Peristaltic Pump, Tubing Purge Depth (ft): 20.0
 Sampling Time: 14:20 Depth to Groundwater (ft): _____
 Total Discharge (gal): P Depth to LNAPL (ft): _____
 Water Disposal: On-Site 55-gallon drums Water Column (ft): _____
 Weather: partly cloudy

TOC

Water Quality Meter(s)	Model	Calibration Date/Time	QA/QC Samples		
Temp/pH/SC/ORP/DO:	YSI 556		Type	Sample ID	Time
Turbidity:	Micro TPI		MS	WMW-18-201802 MS	
Other:			MSD	WMW-18-201802 MSD	

Sample ID	Sample Containers				Field Filtered	Analysis Requested	MS/MSD & Comments
	No.	Type	Pres.	Vol.			
	2	VOA	HCl	40 mL	No	NWTPH-Dx w/o SGC	
	2	VOA	HCl	40 mL	No	Methane RSK 175	
	1	HDPE	H2SO4	125 mL	No	Ammonia	
	1	HDPE	H2SO4	250 mL	No	Nitrate-Nitrite	
	1	HDPE	none	125 mL	No	Sulfate	
	1	HDPE	NaOH/ZnAc	125 mL	No	Sulfide	
	1	HDPE	HNO3	250 mL	No	Tot. Metals (As)	
	1	HDPE	HNO3	250 mL	Yes	Dis. Metals (As, Mn, Fe)	
Total		10					

Parameter (every 5 min)	Time	14:10	14:15	14:20					
		min	min	min	min	min	min	min	min
Flow Rate (L/min)		~.2	~.2	~.2					
Volume Purged (Liters)		.2	.4	~.6					
Water Depth (ft)		14.83	14.83	14.84					
Temperature (°C), (± 0.2)		14.78	14.91	14.96					
pH, (± 0.1)		7.60	7.61	7.61					
Sp. Conductance (uS/cm), (± 3%)		561	560	560					
DO (mg/L), (± 10% or 10% of 0.2mg/l)		0.92	0.82	0.79					
ORP (mV), (± 10%)		168.9	167.8	168.4					
Turbidity (NTU), (± 10% or 3 < 10 NTUs)		1.68	1.94	1.32					
Color		clear	clear	clear					
Odor/Evidence of LNAPL		none	none	none					

Notes: (i.e. actions taken if well dewaterers, difficulties in sampling through LNAPL, problems during purging/sampling, etc.)
 1 US Gallon = 3.8 Liters.

FIELD FORM

WATER TABLE/LNAPL THICKNESS MEASUREMENTS
BNSF WISHRAM

Monitoring Personnel:					
Well	Date / Time	Depth to LNAPL (ft bgs)	Depth to Water (ft bgs)	LNAPL Thickness (ft)	Well Status
OHM-1	2-28-18 10:55	9.79	27.4	17.61	good
OHM-2	12:15	10.27	21.33	11.06	good
OHM-3	1:35	16.30	14.60	4.30	good
OHM-4	1:45	-	11.39	-	good
RMD-1	2-27-18 11:35	-	14.82	-	good
RMD-2	11:24	-	14.69	-	good
RMD-3	11:16	-	14.93	-	good
RMD-4	11:05	14.79	14.79	-	good
WMW-1	12:09	-	10.91	-	good
WMW-3	1:09	-	10.73	-	well buried
WMW-5	12:14	-	10.33	-	good
WMW-7	12:34	-	11.79	-	good
WMW-8	12:31	-	11.27	-	good
WMW-9	11:58	-	10.94	-	good
WMW-10	11:47	-	10.96	-	good
WMW-11	12:03	-	10.92	-	good
WMW-12	12:26	-	10.89	-	good
WMW-13	11:53	-	10.43	-	good
WMW-14	11:48	-	15.20	-	good
WMW-15	11:41	-	15.06	-	good
WMW-16	11:31	-	14.81	-	good
WMW-17	11:20	-	14.74	-	good
WMW-18	11:11	-	14.81	-	good
Additional Notes:					

24 to 26 April 2018

Groundwater Purge and Sample Form (Minimal Drawdown)

Kennedy/Jenks Consultants

Date: 4/25/18
 Project Name: BNSF Wishram
 Project Number: 1896120*00

Well Number: WMW-01
 Monument Type: Stickup: (ft PVC) Flush: X
 Well Diameter (in): 2

Sampling Personnel: KET
 Water Level Meter: Solinst OWI
 Purging Equipment: Peristaltic Pump, Tubing
 Sampling Equipment: Peristaltic Pump, Tubing

Well Condition: good - red ana colony
 Total Casing Depth (ft): 20.0 19'8"
 Screened Interval (ft): 10-20
 Purge Depth (ft): 15.0

Sampling Time: 1245
 Total Discharge (gal): _____

Depth to Groundwater (ft): 10.58
 Depth to LNAPL (ft): _____

Water Disposal: On-Site 55-gallon drums

Water Column (ft): _____

Weather: SUNNY

Water Quality Meter(s)	Model	Calibration Date/Time	QA/QC Samples		
Temp/pH/SC/ORP/DO:	YSI 556		Type	Sample ID	Time
Turbidity:	Micro TPI				
Other:					

Sample ID	Sample Containers				Field Filtered	Analysis Requested	MS/MSD & Comments
	No.	Type	Pres.	Vol.			
WMW-01-20180425	2	VOA	HCl	40 mL	No	NWTPH-Dx w/o SGC	
	2	VOA	HCl	40 mL	No	Methane RSK 175	
	1	HDPE	H2SO4	250 mL	No	Nitrate-Nitrite (353.2) & Ammonia (350.1/350.3)	
	1	HDPE	none	125 mL	No	Sulfate (300.0)	
	1	HDPE	NaOH/ZnAc	125 mL	No	Sulfide (376.2)	
	1	HDPE	HNO3	250 mL	Yes	Dis. Metals (Mn, Fe)	

Total 8

Time	1210	1215	1220	1225	1230	1235	1240	
Parameter (every 5 min)	5 min	10 min	15 min	20 min	25 min	30 min	35 min	min
Flow Rate (L/min)	0.7							
Volume Purged (Liters)	0.5	1.0	1.5	2.0	2.5	3.0	3.5	
Water Depth (ft)	10.67	10.69	10.69	10.69	10.70	10.71	10.69	
Temperature (°C), (± 0.2)	16.83	17.09	17.23	17.32	17.04	17.00	16.87	
pH, (± 0.1)	6.99	6.91	6.89	6.89	6.90	6.96	6.91	
Sp. Conductance (µS/cm), (± 3%)	0.570	0.568	0.569	0.569	0.569	0.572	0.573	
DO (mg/L), (± 10% or 10% of 0.2mg/l)	0.74	0.57	0.45	0.39	0.35	0.34	0.31	
ORP (mV), (± 10%)	-73.3	-100.3	-119.0	-124.4	-129.8	-132.5	-134.3	
Turbidity (NTU), (± 10% or 3 <10 NTUs)	8.82	7.80	4.82	5.11	4.26	4.15	5.71	
Color	clear							
Odor/Evidence of LNAPL	NOOKS							

Notes: (i.e. actions taken if well dewater, difficulties in sampling through LNAPL, problems during purging/sampling, etc.)

1 US Gallon = 3.8 Liters.

4/26/18 11:17 : well head air pressure = 0.04 in of water

Groundwater Purge and Sample Form (Minimal Drawdown)

Kennedy/Jenks Consultants

Date: 4/25/18
 Project Name: BNSF Wishram
 Project Number: 1896120*00
 Sampling Personnel: KET
 Water Level Meter: Solinst OWI
 Purging Equipment: Peristaltic Pump, Tubing
 Sampling Equipment: Peristaltic Pump, Tubing
 Sampling Time: 1420
 Total Discharge (gal): _____
 Water Disposal: On-Site 55-gallon drums

Well Number: WMW-03
 Monument Type: Stickup: _____ (ft PVC) Flush: X
 Well Diameter (in): 2
 Well Condition: MISSING bolts - threads stripped
 Total Casing Depth (ft): 20.0 19.11"
 Screened Interval (ft): 10-20
 Purge Depth (ft): 15.0
 Depth to Groundwater (ft): 10.77
 Depth to LNAPL (ft): _____
 Water Column (ft): _____

TOC

Weather: SUNNY

Water Quality Meter(s)	Model	Calibration Date/Time	QA/QC Samples		
Temp/pH/SC/ORP/DO:	YSI 556		Type	Sample ID	Time
Turbidity:	Micro TPI				
Other:					

Sample ID	Sample Containers				Field Filtered	Analysis Requested	MS/MSD & Comments
	No.	Type	Pres.	Vol.			
WMW-03-20180425	2	VOA	HCl	40mL	No	NWTPH-Dx w/ SGC	
	2	VOA	HCl	40 mL	No	NWTPH-Dx w/o SGC	
	2	VOA	HCl	40 mL	No	Methane RSK 175	
	1	HDPE	H2SO4	250 mL	No	Nitrate-Nitrite (353.2) & Ammonia (350.1/350.3)	
	1	HDPE	none	125 mL	No	Sulfate (300.0)	
	1	HDPE	NaOH/ZnAc	125 mL	No	Sulfide (376.2)	
	1	HDPE	HNO3	250 mL	Yes	Dis. Metals (Mn,Fe)	
	Total		10				

Time	1340	1345	1350	1355	1400	1405	1410	1415
Parameter (every 5 min)	5 min	10 min	15 min	20 min	25 min	30 min	35 min	40 min
Flow Rate (L/min)	0.1							
Volume Purged (Liters)	0.5	1.0	1.5	2.0	2.5	3.0	3.5	4.0
Water Depth (ft)	10.82	10.83	10.83	10.84	10.84	10.84	10.84	10.84
Temperature (°C), (± 0.2)	20.13	20.82	20.83	20.56	21.37	21.21	21.34	21.15
pH, (± 0.1)	6.79	6.80	6.83	6.87	6.86	6.86	6.86	6.88
Sp. Conductance (µS/cm), (± 3%)	1.311	1.317	1.323	1.330	1.339	1.338	1.343	1.344
DO (mg/L), (± 10% or 10% of 0.2mg/l)	0.60	0.49	0.24	0.29	0.20	0.18	0.18	0.27
ORP (mV), (± 10%)	84.3	27.5	-10.9	-24.5	-35.8	-45.9	-48.6	-63.7
Turbidity (NTU), (± 10% or 3 <10 NTUs)	106.2*	99.83	78.20	69.81	64.00	53.16	49.50	51.99
Color	clear							
Odor/Evidence of LNAPL	no/s							

Notes: (i.e. actions taken if well dewater, difficulties in sampling through LNAPL, problems during purging/sampling, etc.)

1 US Gallon = 3.8 Liters. * sample only looks slightly turbid, possible turbidity meter overheated. Removed it from direct sunlight.

Groundwater Purge and Sample Form (Minimal Drawdown)

Kennedy/Jenks Consultants

Date: 4/25/18
 Project Name: BNSF Wishram
 Project Number: 1896120*00

Well Number: WMW-05
 Monument Type: Stickup: (ft PVC) Flush: X
 Well Diameter (in): 2

Sampling Personnel: KET
 Water Level Meter: Solinst OWI
 Purging Equipment: Peristaltic Pump, Tubing
 Sampling Equipment: Peristaltic Pump, Tubing

Well Condition: good
 Total Casing Depth (ft): 25.0 24'5"
 Screened Interval (ft): 15-25
 Purge Depth (ft): 20.0

Sampling Time: 1550

Depth to Groundwater (ft): 10.43

TOC

Total Discharge (gal): _____

Depth to LNAPL (ft): _____

Water Disposal: On-Site 55-gallon drums

Water Column (ft): _____

Weather: SUNNY

Water Quality Meter(s)	Model	Calibration Date/Time	QA/QC Samples		
Temp/pH/SC/ORP/DO:	YSI 556		Type	Sample ID	Time
Turbidity:	Micro TPI				
Other:					

Sample ID	Sample Containers				Field Filtered	Analysis Requested	MS/MSD & Comments
	No.	Type	Pres.	Vol.			
WMW-05-20180425	2	VOA	HCl	40mL	No	NWTPH-Dx w/ SGC	
	2	VOA	HCl	40 mL	No	NWTPH-Dx w/o SGC	
	2	VOA	HCl	40 mL	No	Methane RSK 175	
	1	HDPE	H2SO4	250 mL	No	Nitrate-Nitrite (353.2) & Ammonia (350.1/350.3)	
	1	HDPE	none	125 mL	No	Sulfate (300.0)	
	1	HDPE	NaOH/ZnAc	125 mL	No	Sulfide (376.2)	
	1	HDPE	HNO3	250 mL	Yes	Dis. Metals (Mn,Fe)	
Total		10					

Time	1515	1520	1525	1530	1535	1540	1545	
Parameter (every 5 min)	5 min	10 min	15 min	20 min	25 min	30 min	35 min	min
Flow Rate (L/min)	0.1							
Volume Purged (Liters)	0.5	1.0	1.5	2.0	2.5	3.0	3.5	
Water Depth (ft)	10.43	10.44	10.44	10.44	10.44	10.44	10.44	
Temperature (°C), (± 0.2)	18.22	17.95	17.78	18.38	18.43	18.23	18.78	
pH, (± 0.1)	7.83	7.85	7.79	7.76	7.78	7.76	7.76	
Sp. Conductance ^m (µS/cm), (± 3%)	0.439	0.434	0.433	0.434	0.436	0.440	0.440	
DO (mg/L), (± 10% or 10% of 0.2mg/l)	2.77	2.08	1.97	1.89	1.86	1.79	1.69	
ORP (mV), (± 10%)	184.4	168.2	146.4	135.4	122.3	115.7	112.8	
Turbidity (NTU), (± 10% or 3 <10 NTUs)	21.71	18.92	19.72	18.00	16.98	16.31	17.97	
Color	clear							
Odor/Evidence of LNAPL	no/s							

Notes: (i.e. actions taken if well dewater, difficulties in sampling through LNAPL, problems during purging/sampling, etc.)

1 US Gallon = 3.8 Liters.

0738 well head pressure out of range (>1.0 inches of water)

Groundwater Purge and Sample Form (Minimal Drawdown)

Kennedy/Jenks Consultants

Date: 4/26/18 Well Number: WMW-07
 Project Name: BNSF Wishram Monument Type: Stickup (ft PVC) Flush: X
 Project Number: 1896120*00 Well Diameter (in): 2
 Sampling Personnel: KET Well Condition: good
 Water Level Meter: Solinst OWI Total Casing Depth (ft): 20.0 18' 8"
 Purging Equipment: Peristaltic Pump, Tubing Screened Interval (ft): 10-20
 Sampling Equipment: Peristaltic Pump, Tubing Purge Depth (ft): 15
 Sampling Time: _____ Depth to Groundwater (ft): 11.65
 Total Discharge (gal): _____ Depth to LNAPL (ft): shleen
 Water Disposal: On-Site 55-gallon drums Water Column (ft): _____
 Weather: Sunny

TOC

Water Quality Meter(s)	Model	Calibration Date/Time	QA/QC Samples		
Temp/pH/SC/ORP/DO:	YSI 556		Type	Sample ID	Time
Turbidity:	Micro TPI				
Other:					

Sample ID	Sample Containers				Field Filtered	Analysis Requested	MS/MSD & Comments
	No.	Type	Pres.	Vol.			
WMW	2	VOA	HCl	40 mL	No	NWTPH-Dx w/o SGC	
	2	VOA	HCl	40 mL	No	Methane RSK 175	
	1	HDPE	H2SO4	250 mL	No	Nitrate-Nitrite (353.2) & Ammonia (350.1/350.3)	
	1	HDPE	none	125 mL	No	Sulfate (300.0)	
	1	HDPE	NaOH/ZnAc	125 mL	No	Sulfide (376.2)	
	1	HDPE	HNO3	250 mL	Yes	Dis. Metals (Mn, Fe)	
	Total		8				

Time								
Parameter (every 5 min)	min	min	min	min	min	min	min	min
Flow Rate (L/min)								
Volume Purged (Liters)								
Water Depth (ft)								
Temperature (°C), (± 0.2)								
pH, (± 0.1)								
Sp. Conductance (uS/cm), (± 3%)								
DO (mg/L), (± 10% or 10% of 0.2mg/l)								
ORP (mV), (± 10%)								
Turbidity (NTU), (± 10% or 3 <10 NTUs)								
Color								
Odor/Evidence of LNAPL								

Notes: (i.e. actions taken if well dewater, difficulties in sampling through LNAPL, problems during purging/sampling, etc.)

1 US Gallon = 3.8 Liters.

shleen in purge water. Did not sample.
Strong petrol odor

0820 : well head pressure = 0.21 inches of water

Groundwater Purge and Sample Form (Minimal Drawdown)

Kennedy/Jenks Consultants

Date: 4/26/18
 Project Name: BNSF Wishram
 Project Number: 1896120*00
 Sampling Personnel: KET
 Water Level Meter: Solinst OWI
 Purging Equipment: Peristaltic Pump, Tubing
 Sampling Equipment: Peristaltic Pump, Tubing
 Sampling Time: _____
 Total Discharge (gal): _____
 Water Disposal: On-Site 55-gallon drums
 Weather: SUNNY

Well Number: WMW-08
 Monument Type: Stickup (ft PVC) Flush: X
 Well Diameter (in): 2
 Well Condition: good
 Total Casing Depth (ft): 25.0 21' 7"
 Screened Interval (ft): 7-22
 Purge Depth (ft): _____
 Depth to Groundwater (ft): 11.22
 Depth to LNAPL (ft): sheen
 Water Column (ft): _____

TOC

Water Quality Meter(s)	Model	Calibration Date/Time	QA/QC Samples		
Temp/pH/SC/ORP/DO:	YSI 556		Type	Sample ID	Time
Turbidity:	Micro TPI				
Other:					

Sample ID	Sample Containers				Field Filtered	Analysis Requested	MS/MSD & Comments
	No.	Type	Pres.	Vol.			
	2	VOA	HCl	40 mL	No	NWTPH-Dx w/o SGC	
	2	VOA	HCl	40 mL	No	Methane RSK 175	
	1	HDPE	H2SO4	250 mL	No	Nitrate-Nitrite (353.2) & Ammonia (350.1/350.3)	
	1	HDPE	none	125 mL	No	Sulfate (300.0)	
	1	HDPE	NaOH/ZnAc	125 mL	No	Sulfide (376.2)	
	1	HDPE	HNO3	250 mL	Yes	Dis. Metals (Mn,Fe)	
Total		8					

Parameter (every 5 min)	min	min	min	min	min	min	min	min	min
Flow Rate (L/min)									
Volume Purged (Liters)									
Water Depth (ft)									
Temperature (°C), (± 0.2)									
pH, (± 0.1)									
Sp. Conductance (uS/cm), (± 3%)									
DO (mg/L), (± 10% or 10% of 0.2mg/l)									
ORP (mV), (± 10%)									
Turbidity (NTU), (± 10% or 3 <10 NTUs)									
Color									
Odor/Evidence of LNAPL									

Notes: (i.e. actions taken if well dewater, difficulties in sampling through LNAPL, problems during purging/sampling, etc.)
 1 US Gallon = 3.8 Liters. strong petrol-odor. Sheen in purge water, did not sample.

Groundwater Purge and Sample Form (Minimal Drawdown)

Kennedy/Jenks Consultants

Date: 4/25/18
 Project Name: BNSF Wishram
 Project Number: 1896120*00
 Sampling Personnel: KET
 Water Level Meter: Solinst OWI
 Purging Equipment: Peristaltic Pump, Tubing
 Sampling Equipment: Peristaltic Pump, Tubing
 Sampling Time: 0940
 Total Discharge (gal): _____
 Water Disposal: On-Site 55-gallon drums

Well Number: WMW-09
 Monument Type: Stickup: _____ (ft PVC) Flush: X
 Well Diameter (in): 2
 Well Condition: good
 Total Casing Depth (ft): 25.0 9' 8"
 Screened Interval (ft): 8.5-23.5
 Purge Depth (ft): 15.0
 Depth to Groundwater (ft): 11.02
 Depth to LNAPL (ft): _____
 Water Column (ft): _____

TOC

Weather: SUNNY

Water Quality Meter(s)	Model	Calibration Date/Time	QA/QC Samples		
Temp/pH/SC/ORP/DO:	YSI 556		Type	Sample ID	Time
Turbidity:	Micro TPI				
Other:					

Sample ID	Sample Containers				Field Filtered	Analysis Requested	MS/MSD & Comments
	No.	Type	Pres.	Vol.			
WMW-09 - 20180425	2	VOA	HCl	40mL	No	NWTPH-Dx w/ SGC	
	2	VOA	HCl	40 mL	No	NWTPH-Dx w/o SGC	
	2	VOA	HCl	40 mL	No	Methane RSK 175	
	1	HDPE	H2SO4	250 mL	No	Nitrate-Nitrite (353.2) & Ammonia (350.1/350.3)	
	1	HDPE	none	125 mL	No	Sulfate (300.0)	
	1	HDPE	NaOH/ZnAc	125 mL	No	Sulfide (376.2)	
	1	HDPE	HNO3	250 mL	Yes	Dis. Metals (Mn,Fe)	
	Total		10				

Time	0915	0920	0925	0930	0935			
Parameter (every 5 min)	5 min	10 min	15 min	20 min	25 min	min	min	min
Flow Rate (L/min)	0.1							
Volume Purged (Liters)	0.5	1.0	1.5	2.0	2.5			
Water Depth (ft)	11.05	11.05	11.05	11.05	11.05			
Temperature (°C), (± 0.2)	14.85	14.89	15.00	15.00	14.99			
pH, (± 0.1)	7.47	7.38	7.33	7.32	7.30			
Sp. Conductance ^m (µS/cm), (± 3%)	0.681	0.679	0.676	0.675	0.674			
DO (mg/L), (± 10% or 10% of 0.2mg/l)	0.87	0.63	0.50	0.47	0.46			
ORP (mV), (± 10%)	283.9	282.5	280.1	279.0	277.6			
Turbidity (NTU), (± 10% or 3 <10 NTUs)	6.89	4.61	5.31	5.17	4.99			
Color	clear							
Odor/Evidence of LNAPL	NO O/S							

Notes: (i.e. actions taken if well dewater, difficulties in sampling through LNAPL, problems during purging/sampling, etc.)

1 US Gallon = 3.8 Liters.

Groundwater Purge and Sample Form (Minimal Drawdown)

Kennedy/Jenks Consultants

Date: 4/25/18
 Project Name: BNSF Wishram
 Project Number: 1896120*00
 Sampling Personnel: KET
 Water Level Meter: Solinst OWI
 Purging Equipment: Peristaltic Pump, Tubing
 Sampling Equipment: Peristaltic Pump, Tubing
 Sampling Time: 1040
 Total Discharge (gal): _____
 Water Disposal: On-Site 55-gallon drums

Well Number: WMW-10
 Monument Type: Stickup: _____ (ft PVC) Flush: X
 Well Diameter (in): 2
 Well Condition: good
 Total Casing Depth (ft): 25.0' 10' 11"
 Screened Interval (ft): 7.5-22.5
 Purge Depth (ft): 15.0
 Depth to Groundwater (ft): 11.11
 Depth to LNAPL (ft): _____
 Water Column (ft): _____

TOC

Weather: SUNNY

Water Quality Meter(s)	Model	Calibration Date/Time	QA/QC Samples		
Temp/pH/SC/ORP/DO:	YSI 556		Type	Sample ID	Time
Turbidity:	Micro TPI				
Other:					

Sample ID	Sample Containers				Field Filtered	Analysis Requested	MS/MSD & Comments
	No.	Type	Pres.	Vol.			
WMW-10- 20180425	2	VOA	HCl	40 mL	No	NWTPH-Dx w/o SGC	
	2	VOA	HCl	40 mL	No	Methane RSK 175	
	1	HDPE	H2SO4	250 mL	No	Nitrate-Nitrite (353.2) & Ammonia (350.1/350.3)	
	1	HDPE	none	125 mL	No	Sulfate (300.0)	
	1	HDPE	NaOH/ZnAc	125 mL	No	Sulfide (376.2)	
	1	HDPE	HNO3	250 mL	Yes	Dis. Metals (Mn,Fe)	
Total		8					

Time	1015	1020	1025	1030	1035		
1010							
Parameter (every 5 min)	5 min	10 min	15 min	20 min	25 min	min	min
Flow Rate (L/min)	0.1						
Volume Purged (Liters)	0.5	1.0	1.5	2.0	2.5		
Water Depth (ft)	11.15	11.15	11.15	11.16	11.16		
Temperature (°C), (± 0.2)	15.67	15.63	15.85	15.95	16.06		
pH, (± 0.1)	7.47	7.42	7.41	7.41	7.41		
Sp. Conductance (uS/cm), (± 3%)	0.823	0.825	0.829	0.829	0.827		
DO (mg/L), (± 10% or 10% of 0.2mg/l)	2.77	2.46	2.33	2.28	2.24		
ORP (mV), (± 10%)	277.5	269.0	260.8	254.3	249.2		
Turbidity (NTU), (± 10% or 3 <10 NTUs)	10.44	9.00	8.39	8.42	7.80		
Color	clear						
Odor/Evidence of LNAPL	no						

Notes: (i.e. actions taken if well dewater, difficulties in sampling through LNAPL, problems during purging/sampling, etc.)

1 US Gallon = 3.8 Liters.

Groundwater Purge and Sample Form (Minimal Drawdown)

Kennedy/Jenks Consultants

Date: 4/25/18 Well Number: WMW-11
 Project Name: BNSF Wishram Monument Type: Stickup (ft PVC) Flush: X
 Project Number: 1896120*00 Well Diameter (in): 2
 Sampling Personnel: KET Well Condition: good
 Water Level Meter: Solinst OWI Total Casing Depth (ft): 25.0 21'6"
 Purging Equipment: Peristaltic Pump, Tubing Screened Interval (ft): 7-22
 Sampling Equipment: Peristaltic Pump, Tubing Purge Depth (ft): 15.0
 Sampling Time: 1135 Depth to Groundwater (ft): 11.03 **TOC**
 Total Discharge (gal): _____ Depth to LNAPL (ft): _____
 Water Disposal: On-Site 55-gallon drums Water Column (ft): _____
 Weather: SUNNY

Water Quality Meter(s)	Model	Calibration Date/Time	QA/QC Samples		
Temp/pH/SC/ORP/DO:	YSI 556		Type	Sample ID	Time
Turbidity:	Micro TPI				
Other:					

Sample ID	Sample Containers				Field Filtered	Analysis Requested	MS/MSD & Comments
	No.	Type	Pres.	Vol.			
WMW-11-20180425	2	VOA	HCl	40 mL	No	NWTPH-Dx w/o SGC	
	2	VOA	HCl	40 mL	No	Methane RSK 175	
	1	HDPE	H2SO4	250 mL	No	Nitrate-Nitrite (353.2) & Ammonia (350.1/350.3)	
	1	HDPE	none	125 mL	No	Sulfate (300.0)	
	1	HDPE	NaOH/ZnAc	125 mL	No	Sulfide (376.2)	
	1	HDPE	HNO3	250 mL	Yes	Dis. Metals (Mn, Fe)	
	Total		8				

Time	1105	1110	1115	1120	1125	1130		
Parameter (every 5 min)	5 min	10 min	15 min	20 min	25 min	30 min	min	min
Flow Rate (L/min)	0.1							
Volume Purged (Liters)	0.5	1.0	1.5	2.0	2.5	3.0		
Water Depth (ft)	11.15	11.10	11.15	11.10	11.10	11.10		
Temperature (°C), (± 0.2)	10.20	10.13	10.26	10.42	10.33	10.41		
pH, (± 0.1)	7.41	7.41	7.42	7.42	7.42	7.43		
Sp. Conductance (µS/cm), (± 3%)	1.190	1.180	1.188	1.194	1.199	1.197		
DO (mg/L), (± 10% or 10% of 0.2mg/l)	0.73	0.60	0.54	0.44	0.42	0.40		
ORP (mV), (± 10%)	275.9	270.8	267.2	260.7	259.2	258.3		
Turbidity (NTU), (± 10% or 3 <10 NTUs)	9.47	12.80	13.34	11.90	11.85	12.01		
Color	clear							
Odor/Evidence of LNAPL	no							

Notes: (i.e. actions taken if well dewater, difficulties in sampling through LNAPL, problems during purging/sampling, etc.)

1 US Gallon = 3.8 Liters.

0922: well head pressure = 0.03 inches of water

Groundwater Purge and Sample Form (Minimal Drawdown)

Kennedy/Jenks Consultants

Date: 4/26/18
 Project Name: BNSF Wishram
 Project Number: 1896120*00
 Sampling Personnel: KBT
 Water Level Meter: Solinst OWI
 Purging Equipment: Peristaltic Pump, Tubing
 Sampling Equipment: Peristaltic Pump, Tubing
 Sampling Time: 1010
 Total Discharge (gal): _____
 Water Disposal: On-Site 55-gallon drums
 Weather: SUNNY

Well Number: WMW-12
 Monument Type: Stickup (ft PVC) Flush: X
 Well Diameter (in): 2
 Well Condition: good
 Total Casing Depth (ft): 25.0/21.2"
 Screened Interval (ft): 6-21
 Purge Depth (ft): 15.0
 Depth to Groundwater (ft): 10.09
 Depth to LNAPL (ft): _____
 Water Column (ft): _____

TOC

Water Quality Meter(s)	Model	Calibration Date/Time	QA/QC Samples		
Temp/pH/SC/ORP/DO:	YSI 556		Type	Sample ID	Time
Turbidity:	Micro TPI				
Other:					

Sample ID	Sample Containers				Field Filtered	Analysis Requested	MS/MSD & Comments
	No.	Type	Pres.	Vol.			
WMW-12- 20180426	2	VOA	HCl	40 mL	No	NWTPH-Dx w/o SGC	
	2	VOA	HCl	40 mL	No	Methane RSK 175	
	1	HDPE	H2SO4	250 mL	No	Nitrate-Nitrite (353.2) & Ammonia (350.1/350.3)	
	1	HDPE	none	125 mL	No	Sulfate (300.0)	
	1	HDPE	NaOH/ZnAc	125 mL	No	Sulfide (376.2)	
	1	HDPE	HNO3	250 mL	Yes	Dis. Metals (Mn,Fe)	
	Total		8				

Time	0935	0940	0945	0950	0955	1000	1005	
Parameter (every 5 min)	5 min	10 min	15 min	20 min	25 min	30 min	35 min	min
Flow Rate (L/min)	0.1							
Volume Purged (Liters)	0.5	1.0	1.5	2.0	2.5	3.0	3.5	
Water Depth (ft)	10.91	10.91	10.91	10.93	10.93	10.93	10.91	
Temperature (°C), (± 0.2)	15.83	16.17	16.29	16.32	16.37	16.59	16.55	
pH, (± 0.1)	7.71	7.60	7.64	7.61	7.60	7.59	7.59	
Sp. Conductance (µS/cm), (± 3%)	1.020	1.020	1.020	1.022	1.021	1.021	1.021	
DO (mg/L), (± 10% or 10% of 0.2mg/l)	2.91	2.73	2.71	2.45	2.45	2.35	2.33	
ORP (mV), (± 10%)	227.2	223.2	219.9	214.0	211.5	207.5	205.4	
Turbidity (NTU), (± 10% or 3 <10 NTUs)	37.21	30.85	33.00	23.65	24.84	20.28	20.10	
Color	clear							
Odor/Evidence of LNAPL	no O/S							

Notes: (i.e. actions taken if well dewater, difficulties in sampling through LNAPL, problems during purging/sampling, etc.)

1 US Gallon = 3.8 Liters.

Groundwater Purge and Sample Form (Minimal Drawdown)

Kennedy/Jenks Consultants

Date: 4/25/18
 Project Name: BNSF Wishram
 Project Number: 1896120*00

Well Number: WMW-13
 Monument Type: Stickup: (ft PVC) Flush: X
 Well Diameter (in): 2

Sampling Personnel: KET
 Water Level Meter: Solinst OWI
 Purging Equipment: Peristaltic Pump, Tubing
 Sampling Equipment: Peristaltic Pump, Tubing

Well Condition: good
 Total Casing Depth (ft): 25.0 20' 10"
 Screened Interval (ft): 6-21
 Purge Depth (ft): 15.0 18 15

Sampling Time: 0835

Depth to Groundwater (ft): 11.51

Total Discharge (gal): _____

Depth to LNAPL (ft): —

Water Disposal: On-Site 55-gallon drums

Water Column (ft): _____

Weather: SUNNY

TOC

Water Quality Meter(s)	Model	Calibration Date/Time	QA/QC Samples		
Temp/pH/SC/ORP/DO:	YSI 556	4/23/18	Type	Sample ID	Time
Turbidity:	Micro TPI	1			
Other:					

Sample ID	Sample Containers				Field Filtered	Analysis Requested	MS/MSD & Comments
	No.	Type	Pres.	Vol.			
WMW-13- 20180425	2	VOA	HCl	40 mL	No	NWTPH-Dx w/o SGC	
	2	VOA	HCl	40 mL	No	Methane RSK 175	
	1	HDPE	H2SO4	250 mL	No	Nitrate-Nitrite (353.2) & Ammonia (350.1/350.3)	
	1	HDPE	none	125 mL	No	Sulfate (300.0)	
	1	HDPE	NaOH/ZnAc	125 mL	No	Sulfide (376.2)	
	1	HDPE	HNO3	250 mL	Yes	Dis.Metals (Mn,Fe)	
	Total		8				

Parameter (every 5 min)	Time	0800	0805	0810	0815	0820	0825	0830
	5 min	10 min	15 min	20 min	25 min	30 min	35 min	min
Flow Rate (L/min)	0.1							
Volume Purged (Liters)	0.5	1.0	1.5	2.0	2.5	3.0	3.5	
Water Depth (ft)	11.58	11.60	11.60	11.60	11.60	11.59	11.59	
Temperature (°C), (± 0.2)	14.59	14.86	14.96	15.00	14.82	14.87	14.78	
pH, (± 0.1)	7.40	7.46	7.48	7.50	7.52	7.53	7.54	
Sp. Conductance ^m (µS/cm), (± 3%)	0.794	0.795	0.798	0.799	0.799	0.799	0.804	
DO (mg/L), (± 10% or 10% of 0.2mg/l)	2.99	2.79	2.70	2.66	2.61	2.61	2.53	
ORP (mV), (± 10%)	295.7	293.2	291.4	290.3	288.6	286.9	285.4	
Turbidity (NTU), (± 10% or 3 <10 NTUs)	88.51	79.65	75.90	65.45	41.39	45.13	41.27	
Color	clear							
Odor/Evidence of LNAPL	no ois							

Notes: (i.e. actions taken if well dewateres, difficulties in sampling through LNAPL, problems during purging/sampling, etc.)

1 US Gallon = 3.8 Liters.

Wishram Railyard

Well	Transducer S/N	DTP	DTW	Time
WMW-1	10445226			
WMW-3	10523112			
WMW-5	10523208			
WMW-8	10685099			
WMW-9	10365979			
WMW-10	10523206	—	11.13	13:51
WMW-11	10816700			
WMW-14	10960233	—	15.39	13:39
WMW-16	10922785	—	15.02	13:21
WMW-18	10960173	—	14.99	13:00
RMD-2	10922849	—	14.88	13:16
OHM-1	10462911	9.77	30.24	12:39
OHM-2	10462912			
OHM-3	10523207		16.80	16:05
OHM-4	10523205	—	11.48 16.80	16:30 16:05
River#1	10445227	—	—	11:50 a
River#2	10445230	—	—	10:58 a
River#3	10462914	—	—	11:27 a
Barometric	10387287	—	—	

river depth 6.25" relative to WWTP outfall 12:20

FIELD FORM

WATER TABLE/LNAPL THICKNESS MEASUREMENTS
BNSF WISHRAM

Monitoring Personnel:					
Well	Date / Time	Depth to LNAPL (ft btoc)	Depth to Water (ft btoc)	LNAPL Thickness (ft)	Well Status
OHM-1					
OHM-2					
OHM-3					
OHM-4					
RMD-1	13:29	-	19.06	-	good
RMD-2	13:16	-	14.88	-	good
RMD-3	13:08	-	18.10	-	good
RMD-4	12:57	-	14.97	-	good
WMW-1					
WMW-3					
WMW-5					
WMW-7	15:00	-	11.64	-	good
WMW-8	15:01	-	11.14	-	good
WMW-9			10.83 (RH 5/21/18)		
WMW-10	13:51	-	11.13	-	good
WMW-11		-	-	-	good
WMW-12	15:17	-	11.83	-	good
WMW-13	13:46	-	11.53	-	good
WMW-14	13:39	-	15.39	-	good
WMW-15	13:34	-	15.25	-	good
WMW-16	13:21	-	15.02	-	good
WMW-17	13:11	-	14.98	-	good
WMW-18	13:00	-	14.99	-	good
Additional Notes:					

A/24/18

FIELD FORM

WATER TABLE/LNAPL THICKNESS MEASUREMENTS
BNSF WISHRAM

Monitoring Personnel: KET/AR

Well	Date / Time	Depth to LNAPL (ft btoc)	Depth to Water (ft btoc)	LNAPL Thickness (ft)	Well Status
OHM-1	12:34	9.77	30.24		
OHM-2	15:30	10.30	17.00		
OHM-3		10.05			
OHM-4					
RMD-1					
RMD-2					
RMD-3					
RMD-4					
WMW-1	14:05		10.55	—	
WMW-3	13:22		10.75	—	loosed - no bolts. Found 2 bolts
WMW-5	13:36		10.41	—	good
WMW-7					
WMW-8					
WMW-9	14:12		11.01	—	
WMW-10					
WMW-11	14:33		11.00		
WMW-12					
WMW-13					
WMW-14					
WMW-15					
WMW-16					
WMW-17					
WMW-18					

Additional Notes:

21 to 30 August 2018

FIELD FORM

**WATER TABLE/LNAPL THICKNESS MEASUREMENTS
BNSF WISHRAM**

Monitoring Personnel:		AR	08/21/18		
Well	Date / Time	Depth to LNAPL (feet btoc)	Depth to Water (feet btoc)	LNAPL Thickness (feet)	Well Status
OHM-1	12:00	9.47	31.01	21.54	
OHM-2	12:23	10.06	22.04	11.98	
OHM-3	14:26	10.29	22.46	12.17	
OHM-4	15:05	--	11.34	--	
RMD-1	14:58		14.76		
RMD-2	12:27		14.53		
RMD-3	12:18		14.81		
RMD-4	12:07		14.69		
RMD-5	14:49		14.59		
RMD-6	16:46		14.42		
WMW-1	13:33		10.27		
WMW-3	13:27		10.80		
WMW-5	11:58		10.36		
WMW-7	16:29		12.13		
WMW-8	16:27		11.65		
WMW-9	15:02		10.99		
WMW-10	13:39		10.86		
WMW-11	13:44		10.74		
WMW-12	16:19		11.28		
WMW-13	15:05		11.47		
WMW-14	14:44		15.07		
WMW-15	14:54		14.91		
WMW-16	12:31		14.62		
WMW-17	12:33		14.55		
WMW-18	12:13		14.65		
WMW-19	14:36		14.93		

FIELD FORM

**WATER TABLE/LNAPL THICKNESS MEASUREMENTS
BNSF WISHRAM**

Monitoring Personnel:		AR		08/21/18	
Well	Date / Time	Depth to LNAPL (feet btoc)	Depth to Water (feet btoc)	LNAPL Thickness (feet)	Well Status
WMW-20	16:42		14.83		
WMW-21	9:36		14.00		
WMW-22	9:04		14.39		
WMW-23	8:58		14.19		
WMW-24	9:41		10.92		
WMW-26	9:12		11.07		
WMW-27	9:20		9.81		
WMW-28	9:47		9.95		
WMW-29	9:17		11.04		
WMW-30	8:52		10.43		
WMW-31	11:30		10.45		
WMW-32	11:34		11.12		
<u>Additional Notes:</u>					

Groundwater Purge and Sample Form (Minimal Drawdown)

Kennedy/Jenks Consultants

Date: 8/23/18
 Project Name: BNSF Wishram
 Project Number: 1896120*00
 Sampling Personnel: J. Schwarz
 Water Level Meter: Solinst or Geotech OWI
 Purging Equipment: Peristaltic Pump, Tubing
 Sampling Equipment: Peristaltic Pump, Tubing
 Sampling Time: 1345
 Total Discharge (gal): _____
 Water Disposal: On-Site 55-gallon drums

Well Number: WMW-01
 Monument Type: Stickup (ft PVC) Flush: X
 Well Diameter (in): 2
 Well Condition: _____
 Total Casing Depth (ft): 20.0
 Screened Interval (ft): 10-20
 Purge Depth (ft): 15.0
 Depth to Groundwater (ft): 10.34
 Depth to LNAPL (ft): 7/a
 Water Column (ft): _____

TOC

Weather: _____

Water Quality Meter(s)	Model	Calibration Date/Time	QA/QC Samples		
			Type	Sample ID	Time
Temp/pH/SC/ORP/DO:	YSI 556				
Turbidity:	Micro TPI				
Other:					

Sample ID	Sample Containers				Field Filtered	Analyses Requested (X)	MS/MSD & Comments
	No.	Type	Pres.	Vol.			
	2	VOA	HCl	40 mL	No	BTEX (8260)	
	2	VOA	HCl	40 mL	No	NWTPH-Gx	
	2	VOA	HCl	40 mL	No	NWTPH-Dx NO SGC	X
	2	VOA	HCl	40 mL	No	NWTPH-Dx WITH SGC	
	2	VOA	-	40 mL	No	PAHs (8270 SIM)	
	2	VOA	HCl	40 mL	No	Methane (RSK 175)	X
	1	HDPE	H2SO4	250 mL	No	Nitrate-Nitrite (353.2) & Ammonia (350.1/350.3)	X
	1	HDPE	none	125 mL	No	Sulfate (300.0)	X
	1	HDPE	NaOH/ZnAc	125 mL	No	Sulfide (376.2)	X
	1	HDPE	HNO3	250 mL	No	Tot. Metals (As) (6020)	
	1	HDPE	HNO3	250 mL	Yes	Diss.Metals (Mn,Fe)	X

Total Containers 8

Time	1305	1310	1315	1320	1325	1330	1335	1340
Parameter (every 5 min)	5 min	10 min	15 min	20 min	25 min	30 min	35 min	40 min
Flow Rate (L/min)	0.2							
Volume Purged (Liters)	1	2	3	4	5	6	7	8
Water Depth (ft)	10.34	10.46	10.49	10.49	10.49	10.49	10.49	10.49
Temperature (°C), (± 0.2)	26.27	21.52	21.22	21.73	21.78	21.39	21.27	21.14
pH, (± 0.1)	7.04	6.60	6.48	6.60	6.69	6.68	6.69	6.71
Sp. Conductance (uS/cm), (± 3%)	627	597	596	594	595	595	595	595
DO (mg/L), (± 10% or 10% of 0.2mg/l)	1.15	0.64	0.48	0.39	0.38	0.31	0.31	0.29
ORP (mV), (± 10%)	-103.2	-90.0	-92.9	-104.0	-110.1	-116.9	-121.2	-123.7
Turbidity (NTU), (± 10% or 3 <10 NTUs)	11.97	3.02	4.34	3.62	4.70	6.81	4.31	5.62
Color	clear							
Odor/Evidence of LNAPL	no o/s							

Notes: (i.e. actions taken if well dewater, difficulties in sampling through LNAPL, problems during purging/sampling, etc.)

1 US Gallon = 3.8 Liters.

Set purge depth tubing inlet at approx middle of screen if fully saturated or middle of water column height.

Groundwater Purge and Sample Form (Minimal Drawdown)

Kennedy/Jenks Consultants

Date: 8-23-18
 Project Name: BNSF Wishram
 Project Number: 1896120*00
 Sampling Personnel: Robinson
 Water Level Meter: Solinst or Geotech OWI
 Purging Equipment: Peristaltic Pump, Tubing
 Sampling Equipment: Peristaltic Pump, Tubing
 Sampling Time: 11:40 11:48
 Total Discharge (gal): _____
 Water Disposal: On-Site 55-gallon drums

Well Number: WMW-03
 Monument Type: Stickup (ft PVC) Flush: X
 Well Diameter (in): 2
 Well Condition: good
 Total Casing Depth (ft): 20.0
 Screened Interval (ft): 10-20
 Purge Depth (ft): 15.0
 Depth to Groundwater (ft): 10.85
 Depth to LNAPL (ft): _____
 Water Column (ft): _____

TOC

Weather: Sunny, clear

Water Quality Meter(s)	Model	Calibration Date/Time	QA/QC Samples		
Temp/pH/SC/ORP/DO:	YSI 556	8-20-18 4p	Type	Sample ID	Time
Turbidity:	Micro TPI		Pup	P-2-20180823	11:50
Other:					

Sample ID	Sample Containers				Field Filtered	Analyses Requested (X)	MS/MSD & Comments
	No.	Type	Pres.	Vol.			
	2	VOA	HCl	40 mL	No	BTEX (8260)	
	2	VOA	HCl	40 mL	No	NWTPH-Gx	
	2	VOA	HCl	40 mL	No	NWTPH-Dx NO SGC	X
	2	VOA	HCl	40 mL	No	NWTPH-Dx WITH SGC	X
	2	VOA	-	40 mL	No	PAHs (8270 SIM)	
	2	VOA	HCl	40 mL	No	Methane (RSK 175)	X
	1	HDPE	H2SO4	250 mL	No	Nitrate-Nitrite (353.2) & Ammonia (350.1/350.3)	X
	1	HDPE	none	125 mL	No	Sulfate (300.0)	X
	1	HDPE	NaOH/ZnAc	125 mL	No	Sulfide (376.2)	X
	1	HDPE	HNO3	250 mL	No	Tot. Metals (As) (6020)	
	1	HDPE	HNO3	250 mL	Yes	Diss. Metals (Mn, Fe)	X

Total Containers **10**

Parameter (every 5 min)	Time	11:09	11:14	11:19	11:24	11:29	11:34	11:39	11:44
		min	min	min	min	min	min	min	min
Flow Rate (L/min)		~.2	~.2	~.2	~.2	~.2	~.2	~.2	~.2
Volume Purged (Liters)		~1	~2	~3	~4	~5	~6	~7	~8
Water Depth (ft)		10.97	10.97	10.98	10.98	10.99	10.99	10.99	10.99
Temperature (°C), (± 0.2)		21.41	21.23	20.85	20.41	20.27	20.25	20.28	20.18
pH, (± 0.1)		6.80	6.80	6.83	6.83	6.82	6.83	6.83	6.83
Sp. Conductance (uS/cm), (± 3%)		1149	1155	1158	1164	1167	1170	1173	1176
DO (mg/L), (± 10% or 10% of 0.2mg/l)		1.40	0.94	1.07	0.73	0.66	0.39	0.30	0.29
ORP (mV), (± 10%)		-883	-90.6	-94.4	-98.0	-105.5	-103.0	-110.7	-140
Turbidity (NTU), (± 10% or 3 <10 NTUs)		22.07	14.23	9.41	7.06	5.17	5.61	5.32	4.69
Color		clr	clr	clr	clr	clr	clr	clr	clr
Odor/Evidence of LNAPL		mild odor							

Notes: (i.e. actions taken if well dewater, difficulties in sampling through LNAPL, problems during purging/sampling, etc.)

1 US Gallon = 3.8 Liters.

Groundwater Purge and Sample Form (Minimal Drawdown)

Kennedy/Jenks Consultants

Date: 8-23-18 Well Number: WMW-05
 Project Name: BNSF Wishram Monument Type: Stickup (ft PVC) Flush: X
 Project Number: 1896120*00 Well Diameter (in): 2
 Sampling Personnel: Robinson Well Condition: good
 Water Level Meter: Solinst or Geotech OWI Total Casing Depth (ft): 25.0
 Purging Equipment: Peristaltic Pump, Tubing Screened Interval (ft): 15-25
 Sampling Equipment: Peristaltic Pump, Tubing Purge Depth (ft): 20.0
 Sampling Time: 13:10 Depth to Groundwater (ft): 10.41
 Total Discharge (gal): _____ Depth to LNAPL (ft): —
 Water Disposal: On-Site 55-gallon drums Water Column (ft): _____

Weather: Sunny & clear

Water Quality Meter(s)	Model	Calibration Date/Time	QA/QC Samples		
Temp/pH/SC/ORP/DO:	YSI 556	<u>8-20-18 Cp</u>	Type	Sample ID	Time
Turbidity:	Micro TPI				
Other:					

Sample ID	Sample Containers				Field Filtered	Analyses Requested (X)	MS/MSD & Comments
	No.	Type	Pres.	Vol.			
	2	VOA	HCl	40 mL	No	BTEX (8260)	
	2	VOA	HCl	40 mL	No	NWTPH-Gx	
	2	VOA	HCl	40 mL	No	NWTPH-Dx NO SGC	X
	2	VOA	HCl	40 mL	No	NWTPH-Dx WITH SGC	X
	2	VOA	—	40 mL	No	PAHs (8270 SIM)	
	2	VOA	HCl	40 mL	No	Methane (RSK 175)	X
	1	HDPE	H2SO4	250 mL	No	Nitrate-Nitrite (353.2) & Ammonia (350.1/350.3)	X
	1	HDPE	none	125 mL	No	Sulfate (300.0)	X
	1	HDPE	NaOH/ZnAc	125 mL	No	Sulfide (376.2)	X
	1	HDPE	HNO3	250 mL	No	Tot. Metals (As) (6020)	
	1	HDPE	HNO3	250 mL	Yes	Diss. Metals (Mn, Fe)	X

Total Containers 10

	Time	12:52	12:57	13:02	13:07				
Parameter (every 5 min)		min	min	min	min	min	min	min	min
Flow Rate (L/min)		~.2	~.2	~.2	~.2				
Volume Purged (Liters)		1	2	3	~4				
Water Depth (ft)		10.42	10.42	10.42	10.42				
Temperature (°C), (± 0.2)		19.94	19.52	19.13	18.98				
pH, (± 0.1)		8.14	7.87	7.67	7.67				
Sp. Conductance (uS/cm), (± 3%)		482	469	461	460				
DO (mg/L), (± 10% or 10% of 0.2mg/l)		2.31	1.38	0.99	0.96				
ORP (mV), (± 10%)		4.2	12.8	24.7	24.2				
Turbidity (NTU), (± 10% or 3 <10 NTUs)		9.72	4.71	3.98	2.78				
Color		clear	clear	—	—				
Odor/Evidence of LNAPL		mild	—	—	—				

Notes: (i.e. actions taken if well dewater, difficulties in sampling through LNAPL, problems during purging/sampling, etc.)

1 US Gallon = 3.8 Liters.

Groundwater Purge and Sample Form (Minimal Drawdown)

Kennedy/Jenks Consultants

Date: 8-23-18
 Project Name: BNSF Wishram
 Project Number: 1896120*00
 Sampling Personnel: Robinson
 Water Level Meter: Solinst or Geotech OWI
 Purging Equipment: Peristaltic Pump, Tubing
 Sampling Equipment: Peristaltic Pump, Tubing
 Sampling Time: NA
 Total Discharge (gal): _____
 Water Disposal: On-Site 55-gallon drums

Well Number: WMW-07
 Monument Type: Stickup: _____ (ft PVC) Flush: X
 Well Diameter (in): 2
 Well Condition: good
 Total Casing Depth (ft): 20.0
 Screened Interval (ft): 10-20
 Purge Depth (ft): _____
 Depth to Groundwater (ft): 11.68
 Depth to LNAPL (ft): _____
 Water Column (ft): _____

TOC

Weather: sunny, clear

Water Quality Meter(s)	Model	Calibration Date/Time	QA/QC Samples		
Temp/pH/SC/ORP/DO:	YSI 556	<u>8-20-18 4:00p</u>	Type	Sample ID	Time
Turbidity:	Micro TPI				
Other:					

Sample ID	Sample Containers				Field Filtered	Analyses Requested (X)	MS/MSD & Comments
	No.	Type	Pres.	Vol.			
	2	VOA	HCl	40 mL	No	BTEX (8260)	
	2	VOA	HCl	40 mL	No	NWTPH-Gx	
	2	VOA	HCl	40 mL	No	NWTPH-Dx NO SGC	X
	2	VOA	HCl	40 mL	No	NWTPH-Dx WITH SGC	
	2	VOA	-	40 mL	No	PAHs (8270 SIM)	
	2	VOA	HCl	40 mL	No	Methane (RSK 175)	X
	1	HDPE	H2SO4	250 mL	No	Nitrate-Nitrite (353.2) & Ammonia (350.1/350.3)	X
	1	HDPE	none	125 mL	No	Sulfate (300.0)	X
	1	HDPE	NaOH/ZnAc	125 mL	No	Sulfide (376.2)	X
	1	HDPE	HNO3	250 mL	No	Tot. Metals (As) (6020)	
	1	HDPE	HNO3	250 mL	Yes	Diss. Metals (Mn, Fe)	X

Total Containers 8

	Time	<u>8:57</u>	<u>9:02</u>	<u>9:07</u>	<u>9:12</u>	<u>9:17</u>	<u>9:23</u>		
Parameter (every 5 min)		min	min	min	min	min	min	min	min
Flow Rate (L/min)		~.2	~.2	~.2	~.2	~.2	~.2		
Volume Purged (Liters)		~1	~2	~3	~4	~5	~6		
Water Depth (ft)		11.76	11.77	11.78	11.78	11.78	11.78		
Temperature (°C), (± 0.2)		18.90	19.00	18.92	19.02	18.96	18.91		
pH, (± 0.1)		7.01	7.00	6.99	6.99	6.99	6.99		
Sp. Conductance (uS/cm), (± 3%)		1069	1070	1077	1077	1079	1079		
DO (mg/L), (± 10% or 10% of 0.2mg/l)		0.90	0.66	0.39	0.34	0.23	0.21		
ORP (mV), (± 10%)		-112.7	-96.1	-95.1	-106.6	-101.9	-93.1		
Turbidity (NTU), (± 10% or 3 <10 NTUs)		9.34	7.29	6.93	5.87	4.63	3.26		
Color		clr	clr	clr	clr	clr	clr		
Odor/Evidence of LNAPL		strong odor							

Notes: (i.e. actions taken if well dewater, difficulties in sampling through LNAPL, problems during purging/sampling, etc.)

1 US Gallon = 3.8 Liters. screen observed in pump intake; no sample collected. On gauging at 8:57, NAPL layer of 401' thickness detected

Groundwater Purge and Sample Form (Minimal Drawdown)

Kennedy/Jenks Consultants

Date: 8-23-18 Well Number: WMW-08
 Project Name: BNSF Wishram Monument Type: Stickup (ft PVC) Flush: X
 Project Number: 1896120*00 Well Diameter (in): 2
 Sampling Personnel: Robinson Well Condition: good
 Water Level Meter: Solinst or Geotech OWI Total Casing Depth (ft): 25.0
 Purging Equipment: Peristaltic Pump, Tubing Screened Interval (ft): 7-22
 Sampling Equipment: Peristaltic Pump, Tubing Purge Depth (ft): 17'
 Sampling Time: NA Depth to Groundwater (ft): 12.4'
 Total Discharge (gal): _____ Depth to LNAPL (ft): —
 Water Disposal: On-Site 55-gallon drums Water Column (ft): _____

Weather: clear, sunny

Water Quality Meter(s)	Model	Calibration Date/Time	QA/QC Samples		
Temp/pH/SC/ORP/DO:	YSI 556	<u>8-20-18, 4:00p</u>	Type	Sample ID	Time
Turbidity:	Micro TPI				
Other:					

Sample ID	Sample Containers				Field Filtered	Analyses Requested (X)	MS/MSD & Comments
	No.	Type	Pres.	Vol.			
	2	VOA	HCl	40 mL	No	BTEX (8260)	
	2	VOA	HCl	40 mL	No	NWTPH-Gx	
	2	VOA	HCl	40 mL	No	NWTPH-Dx NO SGC	X
	2	VOA	HCl	40 mL	No	NWTPH-Dx WITH SGC	
	2	VOA	—	40 mL	No	PAHs (8270 SIM)	
	2	VOA	HCl	40 mL	No	Methane (RSK 175)	X
	1	HDPE	H2SO4	250 mL	No	Nitrate-Nitrite (353.2) & Ammonia (350.1/350.3)	X
	1	HDPE	none	125 mL	No	Sulfate (300.0)	X
	1	HDPE	NaOH/ZnAc	125 mL	No	Sulfide (376.2)	X
	1	HDPE	HNO3	250 mL	No	Tot. Metals (As) (8020)	
	1	HDPE	HNO3	250 mL	Yes	Diss. Metals (Mn, Fe)	X

Total Containers 8

Time	8:13	8:18	8:23	8:28	8:33			
Parameter (every 5 min)	min	min	min	min	min	min	min	min
Flow Rate (L/min)	~.2	~.2	~.2	~.2	~.2			
Volume Purged (Liters)	~1	~2	~3	~4	~5			
Water Depth (ft)	12.23	12.24	12.24	12.24	12.24			
Temperature (°C), (± 0.2)	18.43	18.38	18.36	18.32	18.33			
pH, (± 0.1)	7.10	6.99	6.96	6.95	6.94			
Sp. Conductance (uS/cm), (± 3%)	1253	1255	1257	1253	1250			
DO (mg/L), (± 10% or 10% of 0.2mg/l)	1.13	0.74	0.55	0.43	0.40			
ORP (mV), (± 10%)	-213.2	-137.6	-130.1	-128.2	-126.0			
Turbidity (NTU), (± 10% or 3 <10 NTUs)	16.11	5.39	6.97	4.68	3.97			
Color	clear, rust colored particles →							
Odor/Evidence of LNAPL	strong odor →							

Notes: (i.e. actions taken if well dewater, difficulties in sampling through LNAPL, problems during purging/sampling, etc.)

1 US Gallon = 3.8 Liters. Shen observed in purge water, no sample collected

Groundwater Purge and Sample Form (Minimal Drawdown)

Kennedy/Jenks Consultants

Date: 8/23/18 Well Number: WMW-09
 Project Name: BNSF Wishram Monument Type: Stickup (ft PVC) Flush: X
 Project Number: 1896120*00 Well Diameter (in): 2
 Sampling Personnel: J. Schwarz Well Condition:
 Water Level Meter: Solinst or Geotech OWI Total Casing Depth (ft): 25.0
 Purging Equipment: Peristaltic Pump, Tubing Screened Interval (ft): 8.5-23.5
 Sampling Equipment: Peristaltic Pump, Tubing Purge Depth (ft): 15.0
 Sampling Time: _____ Depth to Groundwater (ft): 11.04
 Total Discharge (gal): _____ Depth to LNAPL (ft): _____
 Water Disposal: On-Site 55-gallon drums Water Column (ft): _____

Weather: windy, smoky

Water Quality Meter(s)	Model	Calibration Date/Time	QA/QC Samples		
Temp/pH/SC/ORP/DO:	YSI 556		Type	Sample ID	Time
Turbidity:	Micro TPI				
Other:					

Sample ID	Sample Containers				Field Filtered	Analyses Requested (X)	MS/MSD & Comments
	No.	Type	Pres.	Vol.			
	2	VOA	HCl	40 mL	No	BTEX (8260)	
	2	VOA	HCl	40 mL	No	NWTPH-Gx	
	2	VOA	HCl	40 mL	No	NWTPH-Dx NO SGC	X
	2	VOA	HCl	40 mL	No	NWTPH-Dx WITH SGC	X
	2	VOA	-	40 mL	No	PAHs (8270 SIM)	
	2	VOA	HCl	40 mL	No	Methane (RSK 175)	X
	1	HDPE	H2SO4	250 mL	No	Nitrate-Nitrite (353.2) & Ammonia (350.1/350.3)	X
	1	HDPE	none	125 mL	No	Sulfate (300.0)	X
	1	HDPE	NaOH/ZnAc	125 mL	No	Sulfide (376.2)	X
	1	HDPE	HNO3	250 mL	No	Tot. Metals (As) (8020)	
	1	HDPE	HNO3	250 mL	Yes	Diss. Metals (Mn,Fe)	X

Total Containers 10

	0905	0910	0915	0920	0925	0930	0935		
Parameter (every 5 min)	Time	5 min	10 min	15 min	20 min	min	min	min	min
Flow Rate (L/min)		0.2							
Volume Purged (Liters)		1	2	3	4	5	6		
Water Depth (ft)		11.07	11.08	11.09	11.09	11.09	11.09		
Temperature (°C), (± 0.2)		19.58	19.23	19.12	19.25	19.45	19.63		
pH, (± 0.1)		7.20	7.14	7.13	7.17	7.19	7.20		
Sp. Conductance (uS/cm), (± 3%)		658	668	671	672	672	672		
DO (mg/L), (± 10% or 10% of 0.2mg/l)		1.05	0.67	0.57	0.52	0.49	0.47		
ORP (mV), (± 10%)		87.0	76.6	70.5	64.6	59.5	55.9		
Turbidity (NTU), (± 10% or 3 <10 NTUs)		2.89	3.67	3.13	2.68	2.23	2.10		
Color		clear							
Odor/Evidence of LNAPL		noo/s							

Notes: (i.e. actions taken if well dewater, difficulties in sampling through LNAPL, problems during purging/sampling, etc.)

1 US Gallon = 3.8 Liters.

Groundwater Purge and Sample Form (Minimal Drawdown)

Kennedy/Jenks Consultants

Date: 8/23/18
 Project Name: BNSF Wishram
 Project Number: 1896120*00
 Sampling Personnel: J. Schwarz
 Water Level Meter: Solinst or Geotech OWI
 Purging Equipment: Peristaltic Pump, Tubing
 Sampling Equipment: Peristaltic Pump, Tubing
 Sampling Time: 1105
 Total Discharge (gal): _____
 Water Disposal: On-Site 55-gallon drums

Well Number: WMW-10
 Monument Type: Stickup: _____ (ft PVC) Flush: X
 Well Diameter (in): 2
 Well Condition: _____
 Total Casing Depth (ft): 25.0
 Screened Interval (ft): 7.5-22.5
 Purge Depth (ft): 15.0
 Depth to Groundwater (ft): 10.92
 Depth to LNAPL (ft): _____
 Water Column (ft): _____

TOC

Weather: _____

Water Quality Meter(s)	Model	Calibration Date/Time	QA/QC Samples		
			Type	Sample ID	Time
Temp/pH/SC/ORP/DO:	YSI 556				
Turbidity:	Micro TPI				
Other:					

Sample ID	Sample Containers				Field Filtered	Analyses Requested (X)	MS/MSD & Comments
	No.	Type	Pres.	Vol.			
	2	VOA	HCl	40 mL	No	BTEX (8260)	
	2	VOA	HCl	40 mL	No	NWTPH-Gx	
	2	VOA	HCl	40 mL	No	NWTPH-Dx NO SGC	X
	2	VOA	HCl	40 mL	No	NWTPH-Dx WITH SGC	
	2	VOA	-	40 mL	No	PAHs (8270 SIM)	
	2	VOA	HCl	40 mL	No	Methane (RSK 175)	X
	1	HDPE	H2SO4	250 mL	No	Nitrate-Nitrite (353.2) & Ammonia (350.1/350.3)	X
	1	HDPE	none	125 mL	No	Sulfate (300.0)	X
	1	HDPE	NaOH/ZnAc	125 mL	No	Sulfide (376.2)	X
	1	HDPE	HNO3	250 mL	No	Tot. Metals (As) (6020)	
	1	HDPE	HNO3	250 mL	Yes	Diss. Metals (Mn, Fe)	X

Total Containers 8

Time	1030	1035	1040	1045	1050	1055	1100		
Parameter (every 5 min)		5 min	10 min	15 min	20 min	25 min	30 min	min	min
Flow Rate (L/min)		0.2							
Volume Purged (Liters)		1	2	3	4	5	6		
Water Depth (ft)		10.94	10.94	11.58 10.94	10.95	10.95	10.95		
Temperature (°C), (± 0.2)		19.70	19.67	19.58	19.62	19.62	19.72		
pH, (± 0.1)		7.20	7.14	7.21	7.26	7.24	7.26		
Sp. Conductance (uS/cm), (± 3%)		683	680	686	690	690	688		
DO (mg/L), (± 10% or 10% of 0.2mg/l)		2.83	2.49	2.23	2.02	1.94	1.95		
ORP (mV), (± 10%)		91.2	79.7	68.8	62.9	60.7	57.4		
Turbidity (NTU), (± 10% or 3 <10 NTUs)		2.26	2.48	2.15	1.94	2.12	1.72		
Color		clear							
Odor/Evidence of LNAPL		no obs							

Notes: (i.e. actions taken if well dewater, difficulties in sampling through LNAPL, problems during purging/sampling, etc.)

1 US Gallon = 3.8 Liters.

Groundwater Purge and Sample Form (Minimal Drawdown)

Kennedy/Jenks Consultants

Date: 8/23/18
 Project Name: BNSF Wisram
 Project Number: 1896120*00
 Sampling Personnel: J. Schwarz
 Water Level Meter: Solinst or Geotech OWI
 Purging Equipment: Peristaltic Pump, Tubing
 Sampling Equipment: Peristaltic Pump, Tubing
 Sampling Time: 1230
 Total Discharge (gal): _____
 Water Disposal: On-Site 55-gallon drums

Well Number: WMW-11
 Monument Type: Stickup: _____ (ft PVC) Flush: X
 Well Diameter (in): 2
 Well Condition: OK
 Total Casing Depth (ft): 25.0
 Screened Interval (ft): 7-22
 Purge Depth (ft): 15.0
 Depth to Groundwater (ft): 10.82
 Depth to LNAPL (ft): n/a
 Water Column (ft): _____

TOC

Weather: windy

Water Quality Meter(s)	Model	Calibration Date/Time	QA/QC Samples		
Temp/pH/SC/ORP/DO:	YSI 556		Type	Sample ID	Time
Turbidity:	Micro TPI				
Other:					

Sample ID	Sample Containers				Field Filtered	Analyses Requested (X)	MS/MSD & Comments
	No.	Type	Pres.	Vol.			
	2	VOA	HCl	40 mL	No	BTEX (8260)	
	2	VOA	HCl	40 mL	No	NWTPH-Gx	
	2	VOA	HCl	40 mL	No	NWTPH-Dx NO SGC	X
	2	VOA	HCl	40 mL	No	NWTPH-Dx WITH SGC	
	2	VOA	-	40 mL	No	PAHs (8270 SIM)	
	2	VOA	HCl	40 mL	No	Methane (RSK 175)	X
	1	HDPE	H2SO4	250 mL	No	Nitrate-Nitrite (353.2) & Ammonia (350.1/350.3)	X
	1	HDPE	none	125 mL	No	Sulfate (300.0)	X
	1	HDPE	NaOH/ZnAc	125 mL	No	Sulfide (376.2)	X
	1	HDPE	HNO3	250 mL	No	Tot. Metals (As) (6020)	
	1	HDPE	HNO3	250 mL	Yes	Diss. Metals (Mn,Fe)	X

Total Containers 8 ~~1200~~ 1155 1200 1205 1210 1215

Parameter (every 5 min)	Time	5 min	10 min	15 min	20 min	25 min	30 min	35 min	40 min
Flow Rate (L/min)	<u>1145</u>	<u>0.2</u>							
Volume Purged (Liters)		<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>	<u>5</u>	<u>6</u>	<u>7</u>	
Water Depth (ft)		<u>10.93</u>	<u>10.93</u>	<u>10.93</u>	<u>10.93</u>	<u>10.93</u>	<u>10.93</u>	<u>10.93</u>	
Temperature (°C), (± 0.2)		<u>19.88</u>	<u>20.20</u>	<u>20.15</u>	<u>20.41</u>	<u>20.41</u>	<u>20.54</u>	<u>20.59</u>	
pH, (± 0.1)		<u>7.07</u>	<u>7.14</u>	<u>7.22</u>	<u>7.28</u>	<u>7.25</u>	<u>7.33</u>	<u>7.32</u>	
Sp. Conductance (uS/cm), (± 3%)		<u>1071</u>	<u>1072</u>	<u>1071</u>	<u>1073</u>	<u>1071</u>	<u>1072</u>	<u>1071</u>	
DO (mg/L), (± 10% or 10% of 0.2mg/l)		<u>1.97</u>	<u>0.75</u>	<u>0.59</u>	<u>0.49</u>	<u>0.44</u>	<u>0.40</u>	<u>0.39</u>	
ORP (mV), (± 10%)		<u>-2.7</u>	<u>-29.0</u>	<u>-44.3</u>	<u>-58.0</u>	<u>-62.6</u>	<u>-69.3</u>	<u>-71.7</u>	
Turbidity (NTU), (± 10% or 3 <10 NTUs)		<u>11.30</u>	<u>16.10</u>	<u>12.90</u>	<u>5.68</u>	<u>6.99</u>	<u>4.40</u>	<u>3.98</u>	
Color		<u>some small particulates</u>	<u>clear</u>	<u>clear</u>	<u>clear</u>	<u>clear</u>	<u>clear</u>	<u>clear</u>	
Odor/Evidence of LNAPL		<u>no ob</u>							

Notes: (i.e. actions taken if well dewater, difficulties in sampling through LNAPL, problems during purging/sampling, etc.)

1 US Gallon = 3.8 Liters.

Groundwater Purge and Sample Form (Minimal Drawdown)

Kennedy/Jenks Consultants

Date: 8-23-18
 Project Name: BNSF Wishram
 Project Number: 1896120*00

Well Number: WMW-12
 Monument Type: Stickup (ft PVC) Flush: X
 Well Diameter (in): 2

Sampling Personnel: Robinson
 Water Level Meter: Solinst or Geotech OWI
 Purging Equipment: Peristaltic Pump, Tubing
 Sampling Equipment: Peristaltic Pump, Tubing

Well Condition: good
 Total Casing Depth (ft): 25.0
 Screened Interval (ft): 6-21
 Purge Depth (ft): 15.0

Sampling Time: 10:02
 Total Discharge (gal): _____

Depth to Groundwater (ft): 11.30
 Depth to LNAPL (ft): —

Water Disposal: On-Site 55-gallon drums

Water Column (ft): _____

Weather: clear

Water Quality Meter(s)	Model	Calibration Date/Time	QA/QC Samples		
			Type	Sample ID	Time
Temp/pH/SC/ORP/DO:	YSI 556	<u>8:20-18 Ep</u>	MS	WMW-12-2018	MS
Turbidity:	Micro TPI		MSD	WMW-12-2018	MSD
Other:					

Sample ID	Sample Containers				Field Filtered	Analyses Requested (X)	MS/MSD & Comments
	No.	Type	Pres.	Vol.			
	2	VOA	HCl	40 mL	No	BTEX (8260)	
	2	VOA	HCl	40 mL	No	NWTPH-Gx	
	2	VOA	HCl	40 mL	No	NWTPH-Dx NO SGC	X
	2	VOA	HCl	40 mL	No	NWTPH-Dx WITH SGC	
	2	VOA	—	40 mL	No	PAHs (8270 SIM)	
	2	VOA	HCl	40 mL	No	Methane (RSK 175)	X
	1	HDPE	H2SO4	250 mL	No	Nitrate-Nitrite (353.2) & Ammonia (350.1/350.3)	X
	1	HDPE	none	125 mL	No	Sulfate (300.0)	X
	1	HDPE	NaOH/ZnAc	125 mL	No	Sulfide (376.2)	X
	1	HDPE	HNO3	250 mL	No	Tot. Metals (As) (6020)	
	1	HDPE	HNO3	250 mL	Yes	Diss. Metals (Mn, Fe)	X

Total Containers 8

	Time	9:46	9:51	9:56	10:01				
Parameter (every 5 min)		min	min	min	min	min	min	min	min
Flow Rate (L/min)		<u>~.2</u>	<u>~.2</u>	<u>~.2</u>	<u>~.2</u>				
Volume Purged (Liters)		<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>				
Water Depth (ft)		<u>11.34</u>	<u>11.34</u>	<u>11.34</u>	<u>11.34</u>				
Temperature (°C), (± 0.2)		<u>19.05</u>	<u>18.96</u>	<u>18.82</u>	<u>18.76</u>				
pH, (± 0.1)		<u>7.66</u>	<u>7.66</u>	<u>7.65</u>	<u>7.64</u>				
Sp. Conductance (uS/cm), (± 3%)		<u>895</u>	<u>896</u>	<u>892</u>	<u>890</u>				
DO (mg/L), (± 10% or 10% of 0.2mg/l)		<u>1.92</u>	<u>1.55</u>	<u>1.64</u>	<u>1.78</u>				
ORP (mV), (± 10%)		<u>3.1</u>	<u>1.3</u>	<u>4.3</u>	<u>4.0</u>				
Turbidity (NTU), (± 10% or 3 <10 NTUs)		<u>7.87</u>	<u>0.53</u>	<u>0.57</u>	<u>0.58</u>				
Color		<u>clr</u>	<u>clr</u>	<u>clr</u>	<u>clr</u>				
Odor/Evidence of LNAPL		<u>none</u>	<u>none</u>	<u>none</u>	<u>none</u>				

Notes: (i.e. actions taken if well dewateres, difficulties in sampling through LNAPL, problems during purging/sampling, etc.)

1 US Gallon = 3.8 Liters.

Groundwater Purge and Sample Form (Minimal Drawdown)

Kennedy/Jenks Consultants

Date: 8/23/18
 Project Name: BNSF Wishram
 Project Number: 1896120*00
 Sampling Personnel: J. Schwarz
 Water Level Meter: Solinst or Geotech OWI
 Purging Equipment: Peristaltic Pump, Tubing
 Sampling Equipment: Peristaltic Pump, Tubing
 Sampling Time: 0835
 Total Discharge (gal): _____
 Water Disposal: On-Site 55-gallon drums

Well Number: WMW-13
 Monument Type: Stickup: _____ (ft PVC) Flush: X
 Well Diameter (in): 2
 Well Condition: good
 Total Casing Depth (ft): 25.0
 Screened Interval (ft): 6-21
 Purge Depth (ft): 15.0
 Depth to Groundwater (ft): 11.52 ns
 Depth to LNAPL (ft): n/a
 Water Column (ft): _____

TOC

Weather: windy, hazy

Water Quality Meter(s)	Model	Calibration Date/Time	QA/QC Samples		
Temp/pH/SC/ORP/DO:	YSI 556	8/22/18	Type	Sample ID	Time
Turbidity:	Micro TPI				
Other:					

Sample ID	Sample Containers				Field Filtered	Analyses Requested (X)	MS/MSD & Comments
	No.	Type	Pres.	Vol.			
	2	VOA	HCl	40 mL	No	BTEX (8260)	
	2	VOA	HCl	40 mL	No	NWTPH-Gx	
	2	VOA	HCl	40 mL	No	NWTPH-Dx NO SGC	X
	2	VOA	HCl	40 mL	No	NWTPH-Dx WITH SGC	
	2	VOA	-	40 mL	No	PAHs (8270 SIM)	
	2	VOA	HCl	40 mL	No	Methane (RSK 175)	X
	1	HDPE	H2SO4	250 mL	No	Nitrate-Nitrite (353.2) & Ammonia (350.1/350.3)	X
	1	HDPE	none	125 mL	No	Sulfate (300.0)	X
	1	HDPE	NaOH/ZnAc	125 mL	No	Sulfide (376.2)	X
	1	HDPE	HNO3	250 mL	No	Tot. Metals (As) (6020)	
	1	HDPE	HNO3	250 mL	Yes	Diss. Metals (Mn, Fe)	X

Total Containers 8

	Time	0810	0815	0820	0825	0830			
Parameter (every 5 min)	0805	5 min	10 min	15 min	20 min	25 min	min	min	min
Flow Rate (L/min)		0.2							
Volume Purged (Liters)		1	2	3	4	5			
Water Depth (ft)		11.65	11.64	11.64	11.64	11.64			
Temperature (°C), (± 0.2)		18.81	18.99	18.94	18.89	18.86			
pH, (± 0.1)		7.06	7.30	7.38	7.40	7.41			
Sp. Conductance (uS/cm), (± 3%)		664	668	671	672	674			
DO (mg/L), (± 10% or 10% of 0.2mg/l)		3.33	3.45	3.60	3.64	3.64			
ORP (mV), (± 10%)		101.0	87.4	83.1	80.9	79.0			
Turbidity (NTU), (± 10% or 3 <10 NTUs)		5.38	2.58	2.15	2.65	2.24			
Color		clear							
Odor/Evidence of LNAPL		noo/s							

Notes: (i.e. actions taken if well dewater, difficulties in sampling through LNAPL, problems during purging/sampling, etc.)

1 US Gallon = 3.8 Liters.

Groundwater Purge and Sample Form (Minimal Drawdown)

Kennedy/Jenks Consultants

Date: 8/22/18
 Project Name: BNSF Wishram
 Project Number: 1896120*00

Well Number: WMW-14
 Monument Type: Stickup (ft PVC) Flush: X
 Well Diameter (in): 2

Sampling Personnel: J. Schwarz
 Water Level Meter: Solinst or Geotech OWI
 Purging Equipment: Peristaltic Pump, Tubing
 Sampling Equipment: Peristaltic Pump, Tubing

Well Condition:
 Total Casing Depth (ft): 30.0
 Screened Interval (ft): 12-27
 Purge Depth (ft): 20.0

Sampling Time: 1115
 Total Discharge (gal): _____

Depth to Groundwater (ft) 15.04
 Depth to LNAPL (ft): _____

Water Disposal: On-Site 55-gallon drums

Water Column (ft): _____

Weather: _____

Water Quality Meter(s)	Model	Calibration Date/Time	QA/QC Samples		
			Type	Sample ID	Time
Temp/pH/SC/ORP/DO:	YSI 556				
Turbidity:	Micro TPI				
Other:					

Sample ID	Sample Containers				Field Filtered	Analyses Requested (X)		MS/MSD & Comments
	No.	Type	Pres.	Vol.				
	2	VOA	HCl	40 mL	No	BTEX (8260)		
	2	VOA	HCl	40 mL	No	NWTPH-Gx		
	2	VOA	HCl	40 mL	No	NWTPH-Dx NO SGC	X	
	2	VOA	HCl	40 mL	No	NWTPH-Dx WITH SGC	X	
	2	VOA	-	40 mL	No	PAHs (8270 SIM)		
	2	VOA	HCl	40 mL	No	Methane (RSK 175)	X	
	1	HDPE	H2SO4	250 mL	No	Nitrate-Nitrite (353.2) & Ammonia (350.1/350.3)	X	
	1	HDPE	none	125 mL	No	Sulfate (300.0)	X	
	1	HDPE	NaOH/ZnAc	125 mL	No	Sulfide (376.2)	X	
	1	HDPE	HNO3	250 mL	No	Tot. Metals (As) (6020)		
	1	HDPE	HNO3	250 mL	Yes	Diss. Metals (Mn,Fe)	X	

Total Containers 10

Parameter (every 5 min)	Time	5 min	10 min	15 min	20 min	25 min	min	min	min
Flow Rate (L/min)	<u>0920</u> <u>1045</u>	<u>0.2</u>							
Volume Purged (Liters)		<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>	<u>5</u>			
Water Depth (ft)		<u>15.04</u>	<u>15.04</u>	<u>15.04</u>	<u>15.04</u>	<u>15.04</u>			
Temperature (°C), (± 0.2)		<u>17.09</u>	<u>17.18</u>	<u>17.16</u>	<u>17.14</u>	<u>17.22</u>			
pH, (± 0.1)		<u>7.11</u>	<u>7.23</u>	<u>7.37</u>	<u>7.50</u>	<u>7.44</u>			
Sp. Conductance (uS/cm), (± 3%)		<u>251</u>	<u>249</u>	<u>248</u>	<u>248</u>	<u>249</u>			
DO (mg/L), (± 10% or 10% of 0.2mg/l)		<u>6.57</u>	<u>6.44</u>	<u>6.43</u>	<u>6.32</u>	<u>6.21</u>			
ORP (mV), (± 10%)		<u>101.6</u>	<u>95.1</u>	<u>85.9</u>	<u>81.2</u>	<u>79.3</u>			
Turbidity (NTU), (± 10% or 3 <10 NTUs)		<u>2.58</u>	<u>2.31</u>	<u>1.52</u>	<u>1.60</u>	<u>1.73</u>			
Color		<u>clear</u>							
Odor/Evidence of LNAPL		<u>no/ok</u>							

Notes: (i.e. actions taken if well dewater, difficulties in sampling through LNAPL, problems during purging/sampling, etc.)

1 US Gallon = 3.8 Liters.

Groundwater Purge and Sample Form (Minimal Drawdown)

Kennedy/Jenks Consultants

Date: 5/22/18
 Project Name: BNSF Wishram
 Project Number: 1896120*00
 Sampling Personnel: J. Schwartz
 Water Level Meter: Solinst or Geotech OWI
 Purging Equipment: Peristaltic Pump, Tubing
 Sampling Equipment: Peristaltic Pump, Tubing
 Sampling Time: 1240
 Total Discharge (gal): _____
 Water Disposal: On-Site 55-gallon drums

Well Number: WMW-15
 Monument Type: Stickup (ft PVC) Flush: X
 Well Diameter (in): 2
 Well Condition: _____
 Total Casing Depth (ft): 30.0
 Screened Interval (ft): 12-27
 Purge Depth (ft): 20.0
 Depth to Groundwater (ft): 14.80
 Depth to LNAPL (ft): _____
 Water Column (ft): _____

TOC

Weather: _____

Water Quality Meter(s)	Model	Calibration Date/Time	QA/QC Samples		
Temp/pH/SC/ORP/DO:	YSI 556		Type	Sample ID	Time
Turbidity:	Micro TPI				
Other:					

Sample ID	Sample Containers				Field Filtered	Analyses Requested (X)	MS/MSD & Comments
	No.	Type	Pres.	Vol.			
	2	VOA	HCl	40 mL	No	BTEX (8260)	
	2	VOA	HCl	40 mL	No	NWTPH-Gx	
	2	VOA	HCl	40 mL	No	NWTPH-Dx NO SGC	X
	2	VOA	HCl	40 mL	No	NWTPH-Dx WITH SGC	
	2	VOA	-	40 mL	No	PAHs (8270 SIM)	
	2	VOA	HCl	40 mL	No	Methane (RSK 175)	X
	1	HDPE	H2SO4	250 mL	No	Nitrate-Nitrite (353.2) & Ammonia (350.1/350.3)	X
	1	HDPE	none	125 mL	No	Sulfate (300.0)	X
	1	HDPE	NaOH/ZnAc	125 mL	No	Sulfide (376.2)	X
	1	HDPE	HNO3	250 mL	No	Tot. Metals (As) (6020)	
	1	HDPE	HNO3	250 mL	Yes	Diss. Metals (Mn, Fe)	X

Total Containers **8**

Time	1155	1200	1205	1210	1215	1220	1225	1230	
Parameter (every 5 min)		5 min	10 min	15 min	20 min	25 min	30 min	35 min	min
Flow Rate (L/min)	0.20	0.03	0.2						
Volume Purged (Liters)		1	2	3	4	5	6	7	
Water Depth (ft)		14.82	14.85	14.85	14.86	14.85	14.85	14.85	
Temperature (°C), (± 0.2)		19.03	18.80	18.97	18.91	19.50	19.62	19.54	
pH, (± 0.1)		6.64	6.73	6.78	6.90	7.04	7.10	7.08	
Sp. Conductance (uS/cm), (± 3%)		869	868	866	867	866	867	869	
DO (mg/L), (± 10% or 10% of 0.2mg/l)		0.98	0.75	0.76	0.68	0.56	0.52	0.48	
ORP (mV), (± 10%)		83.7	70.4	66.4	59.5	50.4	47.2	48.8	
Turbidity (NTU), (± 10% or 3 <10 NTUs)		5.85	6.89	4.56	8.53	2.32	2.05	3.00	
Color		Clear							
Odor/Evidence of LNAPL		None							

Notes: (i.e. actions taken if well dewater, difficulties in sampling through LNAPL, problems during purging/sampling, etc.)

1 US Gallon = 3.8 Liters.

Groundwater Purge and Sample Form (Minimal Drawdown)

Kennedy/Jenks Consultants

Date: 8/22/18
 Project Name: BNSF Wishram
 Project Number: 1896120*00
 Sampling Personnel: O. Schwarz
 Water Level Meter: Solinst or Geotech OWI
 Purging Equipment: Peristaltic Pump, Tubing
 Sampling Equipment: Peristaltic Pump, Tubing
 Sampling Time: 1705
 Total Discharge (gal): _____
 Water Disposal: On-Site 55-gallon drums

Well Number: WMW-16
 Monument Type: Stickup: _____ (ft PVC) Flush:
 Well Diameter (in): 2
 Well Condition: _____
 Total Casing Depth (ft): 30.0
 Screened Interval (ft): 11.33-26.33
 Purge Depth (ft): 20.0
 Depth to Groundwater (ft): 14.45
 Depth to LNAPL (ft): _____
 Water Column (ft): _____

TOC

Weather: _____

Water Quality Meter(s)	Model	Calibration Date/Time	QA/QC Samples		
Temp/pH/SC/ORP/DO:	YSI 556		Type	Sample ID	Time
Turbidity:	Micro TPI				
Other:					

Sample ID	Sample Containers				Field Filtered	Analyses Requested (X)		MS/MSD & Comments
	No.	Type	Pres.	Vol.				
	2	VOA	HCl	40 mL	No	BTEX (8260)		
	2 3	VOA	HCl	40 mL	No	NWTPH-Gx	X	
	2	VOA	HCl	40 mL	No	NWTPH-Dx NO SGC	X	
	2	VOA	HCl	40 mL	No	NWTPH-Dx WITH SGC	X	
	2	VOA	-	40 mL	No	PAHs (8270 SIM)	X	
	2	VOA	HCl	40 mL	No	Methane (RSK 175)	X	
	1	HDPE	H2SO4	250 mL	No	Nitrate-Nitrite (353.2) & Ammonia (350.1/350.3)	X	
	1	HDPE	none	125 mL	No	Sulfate (300.0)	X	
	1	HDPE	NaOH/ZnAc	125 mL	No	Sulfide (376.2)	X	
	1	HDPE	HNO3	250 mL	No	Tot. Metals (As) (8020)		
	1	HDPE	HNO3	250 mL	Yes	Diss. Metals (Mn, Fe)	X	

Total Containers 15

	Time	1625	1630	1635	1640	1645	1650	1655	1700
Parameter (every 5 min)		5 min	10 min	15 min	20 min	25 min	30 min	35 min	40 min
Flow Rate (L/min)		0.2							
Volume Purged (Liters)		1	2	3	4	5	6	7	8
Water Depth (ft)		14.47	14.47	14.48	14.48	14.49	14.49	14.49	14.49
Temperature (°C), (± 0.2)		18.94	19.53	19.41	19.26	19.08	19.31	19.38	19.34
pH, (± 0.1)		7.01	6.79	6.73	6.72	6.64	6.65	6.75	6.75
Sp. Conductance (uS/cm), (± 3%)		272	272	271	273	288	294	299	302
DO (mg/L), (± 10% or 10% of 0.2mg/l)		1.53	0.87	0.77	0.69	0.59	0.56	0.50	0.50
ORP (mV), (± 10%)		-7.3	-0.4	4.2	4.8	5.8	4.1	-0.4	-2.2
Turbidity (NTU), (± 10% or 3 <10 NTUs)		5.13	3.42	2.01	2.98	1.50	8.64	3.87	3.40
Color		clear							
Odor/Evidence of LNAPL		hoo/s							

Notes: (i.e. actions taken if well dewater, difficulties in sampling through LNAPL, problems during purging/sampling, etc.)

1 US Gallon = 3.8 Liters.

Groundwater Purge and Sample Form (Minimal Drawdown)

Kennedy/Jenks Consultants

Date: 8-22-18
 Project Name: BNSF Wishram
 Project Number: 1896120*00
 Sampling Personnel: Robinson
 Water Level Meter: Solinst or Geotech OWI
 Purging Equipment: Peristaltic Pump, Tubing
 Sampling Equipment: Peristaltic Pump, Tubing
 Sampling Time: 15:10
 Total Discharge (gal): _____
 Water Disposal: On-Site 55-gallon drums

Well Number: WMW-17
 Monument Type: Stickup: _____ (ft PVC) Flush:
 Well Diameter (in): 2
 Well Condition: good
 Total Casing Depth (ft): 30.0
 Screened Interval (ft): 12-27
 Purge Depth (ft): 20.0
 Depth to Groundwater (ft): 14.08
 Depth to LNAPL (ft): _____
 Water Column (ft): _____

TOC

Weather: _____

Water Quality Meter(s)	Model	Calibration Date/Time	QA/QC Samples		
Temp/pH/SC/ORP/DO:	YSI 556	<u>8-20-18</u> <u>U. Corp</u>	Type	Sample ID	Time
Turbidity:	Micro TPI		Duplicate	<u>D-1-2018</u>	<u>15:15</u>
Other:					

Sample ID	Sample Containers				Field Filtered	Analyses Requested (X)	MS/MSD & Comments
	No.	Type	Pres.	Vol.			
	2	VOA	HCl	40 mL	No	BTEX (8260)	
	2	VOA	HCl	40 mL	No	NWTPH-Gx	X
	2	VOA	HCl	40 mL	No	NWTPH-Dx-NO SGC	X
	2	VOA	HCl	40 mL	No	NWTPH-Dx WITH SGC	
	2	VOA	-	40 mL	No	PAHs (8270 SIM)	
	2	VOA	HCl	40 mL	No	Methane (RSK 175)	X
	1	HDPE	H2SO4	250 mL	No	Nitrate-Nitrite (353.2) & Ammonia (350.1/350.3)	X
	1	HDPE	none	125 mL	No	Sulfate (300.0)	X
	1	HDPE	NaOH/ZnAc	125 mL	No	Sulfide (376.2)	X
	1	HDPE	HNO3	250 mL	No	Tot. Metals (As) (6020)	X
	1	HDPE	HNO3	250 mL	Yes	Diss. Metals (Mn, Fe, As)	X

Total Containers **11**

	Time	14:49	14:54	14:59	15:04	15:09			
Parameter (every 5 min)		min	min	min	min	min	min	min	min
Flow Rate (L/min)		~.2	~.2	~.2	~.2	~.2			
Volume Purged (Liters)		1	2	3	4	5			
Water Depth (ft)		14.13	14.13	14.13	14.13	14.13			
Temperature (°C), (± 0.2)		19.79	19.83	19.67	19.69	19.51			
pH, (± 0.1)		7.04	7.02	6.98	6.93	6.88			
Sp. Conductance (uS/cm), (± 3%)		313	302	284	278	273			
DO (mg/L), (± 10% or 10% of 0.2mg/l)		0.54	0.55	0.60	0.82	0.79			
ORP (mV), (± 10%)		-105.2	-101.0	-93.7	-84.2	-83.1			
Turbidity (NTU), (± 10% or 3 <10 NTUs)		19.34	15.98	11.78	6.64	5.93			
Color		<u>dr. tan</u>	<u>white particles</u>		<u>clr</u>	<u>clr</u>			
Odor/Evidence of LNAPL		<u>mild</u>							

Notes: (i.e. actions taken if well dewatered, difficulties in sampling through LNAPL, problems during purging/sampling, etc.)

1 US Gallon = 3.8 Liters. screen observed during sampling - sampled anyway

Groundwater Purge and Sample Form (Minimal Drawdown)

Kennedy/Jenks Consultants

Date: 8-22-18
 Project Name: BNSF Wishram
 Project Number: 1896120*00

Well Number: WMW-18
 Monument Type: Stickup (ft PVC) Flush: X
 Well Diameter (in): 2

Sampling Personnel: Robinson
 Water Level Meter: Solinst or Geotech OWI
 Purging Equipment: Peristaltic Pump, Tubing
 Sampling Equipment: Peristaltic Pump, Tubing

Well Condition: good
 Total Casing Depth (ft): 30.0
 Screened Interval (ft): 12-27
 Purge Depth (ft): 20.0

Sampling Time: 10:50
 Total Discharge (gal): _____

Depth to Groundwater (ft) 14.46
 Depth to LNAPL (ft): _____

Water Disposal: On-Site 55-gallon drums

Water Column (ft): _____

Weather: Sunny clear

Water Quality Meter(s)	Model	Calibration Date/Time	QA/QC Samples		
Temp/pH/SC/ORP/DO:	YSI 556	8-20-18 4:00p	Type	Sample ID	Time
Turbidity:	Micro TPI		MS	WMW-18-2080822HS	
Other:			MSD	WMW-18-2080822MSD	

Sample ID	Sample Containers				Field Filtered	Analyses Requested (X)	MS/MSD & Comments
	No.	Type	Pres.	Vol.			
	2	VOA	HCl	40 mL	No	BTEX (8260)	
	2	VOA	HCl	40 mL	No	NWTPH-Gx	
	2	VOA	HCl	40 mL	No	NWTPH-Dx NO SGC	X
	2	VOA	HCl	40 mL	No	NWTPH-Dx WITH SGC	X
	2	VOA	-	40 mL	No	PAHs (8270 SIM)	
	2	VOA	HCl	40 mL	No	Methane (RSK 175)	X
	1	HDPE	H2SO4	250 mL	No	Nitrate-Nitrite (353.2) & Ammonia (350.1/350.3)	X
	1	HDPE	none	125 mL	No	Sulfate (300.0)	X
	1	HDPE	NaOH/ZnAc	125 mL	No	Sulfide (376.2)	X
	1	HDPE	HNO3	250 mL	No	Tot. Metals (As) (6020)	X
	1	HDPE	HNO3	250 mL	Yes	Diss. Metals (Mn, Fe, As)	X

Total Containers **11**

Parameter (every 5 min)	Time	min	min	min	min	min	min	min
Flow Rate (L/min)	10:39	~.2	~.2	~.2				
Volume Purged (Liters)		~1	~3	~4				
Water Depth (ft)		14.48	14.49	14.49				
Temperature (°C), (± 0.2)		18.65	18.25	18.32				
pH, (± 0.1)		7.16	7.12	7.13				
Sp. Conductance (uS/cm), (± 3%)		354	354	354				
DO (mg/L), (± 10% or 10% of 0.2mg/l)		2.14	1.53	1.43				
ORP (mV), (± 10%)		117.9	104.8	98.6				
Turbidity (NTU), (± 10% or 3 <10 NTUs)		3.83	2.99	2.57				
Color		clr	clr	clr				
Odor/Evidence of LNAPL		none	none	none				

Notes: (i.e. actions taken if well dewater, difficulties in sampling through LNAPL, problems during purging/sampling, etc.)

1 US Gallon = 3.8 Liters.

Groundwater Purge and Sample Form (Minimal Drawdown)

Kennedy/Jenks Consultants

Date: 8-27-18
 Project Name: BNSF Wishram
 Project Number: 1896120*05
 Sampling Personnel: Robinson
 Water Level Meter: Solinst or Geotech OWI
 Purging Equipment: Peristaltic Pump, Tubing
 Sampling Equipment: Peristaltic Pump, Tubing
 Sampling Time: 16:30
 Total Discharge (gal): _____
 Water Disposal: On-Site 55-gallon drums

Well Number: WMW-19
 Monument Type: Stickup: _____ (ft PVC) Flush:
 Well Diameter (in): 2-inch PVC
 Well Condition: good
 Total Casing Depth (ft): 21.5
 Screened Interval (ft): 11.5-21.5
 Purge Depth (ft): 20'
 Depth to Groundwater (ft): 14.16
 Depth to LNAPL (ft): —
 Water Column (ft): _____

Weather: Sunny, clear

Water Quality Meter(s)	Model	Calibration Date/Time	QA/QC Samples		
Temp/pH/SC/ORP/DO:	YSI 556	8-2018 4p	Type	Sample ID	Time
Turbidity:	Micro TPI				
Other:					

Sample ID	Sample Containers				Field Filtered	Analyses Requested (X)		MS/MSD & Comments
	No.	Type	Pres.	Vol.				
	2	VOA	HCl	40 mL	No	BTEX (8260)	X	
	2	VOA	HCl	40 mL	No	NWTPH-Gx		
	2	VOA	HCl	40 mL	No	NWTPH-Dx NO SGC	X	
	2	VOA	HCl	40 mL	No	NWTPH-Dx WITH SGC		
	2	VOA	—	40 mL	No	PAHs (8270 SIM)	X	
	2	VOA	HCl	40 mL	No	Methane (RSK 175)	X	
	1	HDPE	H2SO4	250 mL	No	Nitrate-Nitrite (353.2) & Ammonia (350.1/350.3)	X	
	1	HDPE	none	125 mL	No	Sulfate (300.0)	X	
	1	HDPE	NaOH/ZnAc	125 mL	No	Sulfide (376.2)	X	
	1	HDPE	HNO3	250 mL	No	Tot. Metals (Pb only) (6020)	X	
	1	HDPE	HNO3	250 mL	Yes	Diss. Metals (Pb, Mn, Fe)	X	

Total Containers **13**

Time	16:17	16:22	16:27	16:32	16:37	16:42	16:47	
Parameter (every 5 min)	min	min	min	min	min	min	min	min
Flow Rate (L/min)	~.2	~.2	~.2	~.2	~.2	~.2	~.2	
Volume Purged (Liters)	~1	~2	~3	~4	~5	~6	~7	
Water Depth (ft)	14.42	14.42	14.42	14.42	14.42	14.42	14.42	
Temperature (°C), (± 0.2)	17.50	17.35	17.27	17.14	17.10	17.13	17.13	
pH, (± 0.1)	7.41	7.36	7.38	7.35	7.41	7.43	7.47	
Sp. Conductance (uS/cm), (± 3%)	251	256	254	247	244	236	236	
DO (mg/L), (± 10% or 10% of 0.2mg/l)	0.69	0.50	0.60	0.78	0.90	0.117	1.18	
ORP (mV), (± 10%)	38.0	-44.3	-91.2	-97.9	-103.1	-103.0	-101.6	
Turbidity (NTU), (± 10% or 3 <10 NTUs)	19.78	7.89	8.66	6.72	5.69	6.53	7.39	
Color	clr w/white particles	clear	clear	clr	clr	clr	clr	
Odor/Evidence of LNAPL	none							

Notes: (i.e. actions taken if well dewaterers, difficulties in sampling through LNAPL, problems during purging/sampling, etc.)

1 US Gallon = 3.8 Liters.

Special note re: analyses: BTEX, Lead + MNA for metals

Groundwater Purge and Sample Form (Minimal Drawdown)

Kennedy/Jenks Consultants

Date: 8-27-18
 Project Name: BNSF Wishram
 Project Number: 1896120*05
 Sampling Personnel: Robinson
 Water Level Meter: Solinst or Geotech OWI
 Purging Equipment: Peristaltic Pump, Tubing
 Sampling Equipment: Peristaltic Pump, Tubing
 Sampling Time: 15:10
 Total Discharge (gal): _____
 Water Disposal: On-Site 55-gallon drums

Well Number: WMW-20
 Monument Type: Stickup: _____ (ft PVC) Flush:
 Well Diameter (in): 2-inch PVC
 Well Condition: good
 Total Casing Depth (ft): 21.5
 Screened Interval (ft): 11.5-21.5
 Purge Depth (ft): 26'
 Depth to Groundwater (ft): 15.13
 Depth to LNAPL (ft): —
 Water Column (ft): _____

TOC

Weather: Sunny, clear

Water Quality Meter(s)	Model	Calibration Date/Time	QA/QC Samples		
Temp/pH/SC/ORP/DO:	YSI 556	<u>8-20-18 4/</u>	Type	Sample ID	Time
Turbidity:	Micro TPI				
Other:					

Sample ID	Sample Containers				Field Filtered	Analyses Requested (X)		MS/MSD & Comments
	No.	Type	Pres.	Vol.				
	2	VOA	HCl	40 mL	No	BTEX (8260)	X	
	2	VOA	HCl	40 mL	No	NWTPH-Gx		
	2	VOA	HCl	40 mL	No	NWTPH-Dx NO SGC	X	
	2	VOA	HCl	40 mL	No	NWTPH-Dx WITH SGC		
	2	VOA	—	40 mL	No	PAHs (8270 SIM)	X	
	2	VOA	HCl	40 mL	No	Methane (RSK 175)	X	
	1	HDPE	H2SO4	250 mL	No	Nitrate-Nitrite (353.2) & Ammonia (350.1/350.3)	X	
	1	HDPE	none	125 mL	No	Sulfate (300.0)	X	
	1	HDPE	NaOH/ZnAc	125 mL	No	Sulfide (376.2)	X	
	1	HDPE	HNO3	250 mL	No	Tot. Metals (RCRA8) (6020)	X	
	1	HDPE	HNO3	250 mL	Yes	Diss. Metals (RCRA8, Mn, Fe)	X	

Total Containers 13

Time	14:34	14:39	14:44	14:49	14:54	14:59	15:04	15:09
Parameter (every 5 min)	min	min	min	min	min	min	min	min
Flow Rate (L/min)	~.2	~.2	~.2	~.2	~.2	~.2	~.2	~.2
Volume Purged (Liters)	~1	~2	~3	~4	~5	~6	~7	~8
Water Depth (ft)	19.50	19.51	19.52	19.52	19.53	19.53	19.54	19.53
Temperature (°C), (± 0.2)	18.30	18.12	17.95	17.96	17.94	17.48	17.92	18.11
pH, (± 0.1)	7.22	7.14	7.13	7.16	7.14	7.13	7.13	7.14
Sp. Conductance (uS/cm), (± 3%)	432	466	490	518	531	540	547	556
DO (mg/L), (± 10% or 10% of 0.2mg/l)	0.36	0.31	0.27	0.26	0.24	0.21	0.20	0.18
ORP (mV), (± 10%)	-140.1	-140.6	-149.5	-155.1	-156.6	-157.2	-158.5	-160.1
Turbidity (NTU), (± 10% or 3 <10 NTUs)	19.94	9.72	7.25	6.23	6.66	5.35	4.87	4.66
Color	small white particles		clear	clear	clear	clear	clear	clear
Odor/Evidence of LNAPL	none							

Notes: (i.e. actions taken if well dewaterers, difficulties in sampling through LNAPL, problems during purging/sampling, etc.)

1 US Gallon = 3.8 Liters.

Special note re: analyses: BTEX, RCRA8 + MNA for metals

Groundwater Purge and Sample Form (Minimal Drawdown)

Kennedy/Jenks Consultants

Date: 8-27-18
 Project Name: BNSF Wishram
 Project Number: 1896120*05
 Sampling Personnel: Robinson
 Water Level Meter: Solinst or Geotech OWI
 Purging Equipment: Peristaltic Pump, Tubing
 Sampling Equipment: Peristaltic Pump, Tubing
 Sampling Time: 13:00
 Total Discharge (gal): _____
 Water Disposal: On-Site 55-gallon drums

Well Number: WMW-21
 Monument Type: Stickup: _____ (ft PVC) Flush:
 Well Diameter (in): 2-inch PVC
 Well Condition: good
 Total Casing Depth (ft): 21.5
 Screened Interval (ft): 11.5-21.5
 Purge Depth (ft): 20'
 Depth to Groundwater (ft): 14.258
 Depth to LNAPL (ft): —
 Water Column (ft): _____

TOC

Weather: sunny, clear

Water Quality Meter(s)	Model	Calibration Date/Time	QA/QC Samples		
Temp/pH/SC/ORP/DO:	YSI 556	<u>8-20-18 4p</u>	Type	Sample ID	Time
Turbidity:	Micro TPI				
Other:					

Sample ID	Sample Containers				Field Filtered	Analyses Requested (X)		MS/MSD & Comments
	No.	Type	Pres.	Vol.				
	2	VOA	HCl	40 mL	No	BTEX (8260)	X	
	2	VOA	HCl	40 mL	No	NWTPH-Gx		
	2	VOA	HCl	40 mL	No	NWTPH-Dx NO SGC	X	
	2	VOA	HCl	40 mL	No	NWTPH-Dx WITH SGC	X	
	2	VOA	—	40 mL	No	PAHs (8270 SIM)	X	
	2	VOA	HCl	40 mL	No	Methane (RSK 175)	X	
	1	HDPE	H2SO4	250 mL	No	Nitrate-Nitrite (353.2) & Ammonia (350.1/350.3)	X	
	1	HDPE	none	125 mL	No	Sulfate (300.0)	X	
	1	HDPE	NaOH/ZnAc	125 mL	No	Sulfide (376.2)	X	
	1	HDPE	HNO3	250 mL	No	Tot. Metals (RCRA8) (6020)	X	
	1	HDPE	HNO3	250 mL	Yes	Diss. Metals (RCRA8, Mn, Fe)	X	

Total Containers 15

Parameter (every 5 min)	Time	12:50	12:55	1:00					
		min	min	min	min	min	min	min	min
Flow Rate (L/min)		<u>~.2</u>	<u>~.2</u>	<u>~.2</u>					
Volume Purged (Liters)		<u>14.45</u>	<u>~2</u>	<u>~3</u>					
Water Depth (ft)		<u>14.45</u>	<u>14.45</u>	<u>4.45</u>					
Temperature (°C), (± 0.2)		<u>17.90</u>	<u>18.07</u>	<u>17.95</u>					
pH, (± 0.1)		<u>7.48</u>	<u>7.46</u>	<u>7.43</u>					
Sp. Conductance (uS/cm), (± 3%)		<u>492</u>	<u>490</u>	<u>488</u>					
DO (mg/L), (± 10% or 10% of 0.2mg/l)		<u>0.36</u>	<u>0.31</u>	<u>0.30</u>					
ORP (mV), (± 10%)		<u>44.8</u>	<u>40.0</u>	<u>36.5</u>					
Turbidity (NTU), (± 10% or 3 <10 NTUs)		<u>15.93</u>	<u>5.80</u>	<u>6.37</u>					
Color		<u>small white particles →</u>		<u>clr</u>					
Odor/Evidence of LNAPL		<u>none</u>		<u>→</u>					

Notes: (i.e. actions taken if well dewaterers, difficulties in sampling through LNAPL, problems during purging/sampling, etc.)

1 US Gallon = 3.8 Liters.

Special note re: analyses: BTEX, NWTPH-Dx with AND without SGC, RCRA8 + MNA for metals

Groundwater Purge and Sample Form (Minimal Drawdown)

Kennedy/Jenks Consultants

Date: Robot 8-27-18
 Project Name: BNSF Wishram
 Project Number: 1896120*05
 Sampling Personnel: Robinson
 Water Level Meter: Solinst or Geotech OWI
 Purging Equipment: Peristaltic Pump, Tubing
 Sampling Equipment: Peristaltic Pump, Tubing
 Sampling Time: 11:20
 Total Discharge (gal): _____
 Water Disposal: On-Site 55-gallon drums

Well Number: WMW-22
 Monument Type: Stickup: _____ (ft PVC) Flush:
 Well Diameter (in): 2-inch PVC
 Well Condition: good
 Total Casing Depth (ft): 21.5
 Screened Interval (ft): 11.5-21.5
 Purge Depth (ft): 20'
 Depth to Groundwater (ft): 14.90
 Depth to LNAPL (ft): —
 Water Column (ft): _____

TOC

Weather: sunny, clear

Water Quality Meter(s)	Model	Calibration Date/Time	QA/QC Samples		
Temp/pH/SC/ORP/DO:	YSI 556	<u>8-20-18 400</u>	Type	Sample ID	Time
Turbidity:	Micro TPI				
Other:					

Sample ID	Sample Containers				Field Filtered	Analyses Requested (X)	MS/MSD & Comments
	No.	Type	Pres.	Vol.			
	2	VOA	HCl	40 mL	No	BTEX (8260)	X
	2	VOA	HCl	40 mL	No	NWTPH-Gx	
	2	VOA	HCl	40 mL	No	NWTPH-Dx NO SGC	X
	2	VOA	HCl	40 mL	No	NWTPH-Dx WITH SGC	X
	2	VOA	—	40 mL	No	PAHs (8270 SIM)	X
	2	VOA	HCl	40 mL	No	Methane (RSK 175)	X
	1	HDPE	H2SO4	250 mL	No	Nitrate-Nitrite (353.2) & Ammonia (350.1/350.3)	X
	1	HDPE	none	125 mL	No	Sulfate (300.0)	X
	1	HDPE	NaOH/ZnAc	125 mL	No	Sulfide (376.2)	X
	1	HDPE	HNO3	250 mL	No	Tot. Metals (RCRA8) (6020)	X
	1	HDPE	HNO3	250 mL	Yes	Diss. Metals (RCRA8, Mn, Fe)	X

Total Containers **15**

Time	11:00	11:05	11:10	11:15	11:20			
Parameter (every 5 min)	min	min	min	min	min	min	min	min
Flow Rate (L/min)	~2	~2	~2	~2	~2			
Volume Purged (Liters)	~1	~2	~3	~4	~5			
Water Depth (ft)	14.90	14.90	14.90	14.90	14.90			
Temperature (°C), (± 0.2)	19.19	19.45	19.35	19.69	19.84			
pH, (± 0.1)	7.41	7.38	7.38	7.36	7.36			
Sp. Conductance (uS/cm), (± 3%)	899	889	801	649	637			
DO (mg/L), (± 10% or 10% of 0.2mg/l)	0.42	0.38	0.81	1.77	1.76			
ORP (mV), (± 10%)	73.6	59.8	50.8	45.2	43.6			
Turbidity (NTU), (± 10% or 3 <10 NTUs)	11.77	7.63	8.04	2.72	4.29			
Color	clr	clr	clr	clr	clr			
Odor/Evidence of LNAPL	none	none	none	none	none			

Notes: (i.e. actions taken if well dewaterers, difficulties in sampling through LNAPL, problems during purging/sampling, etc.)

1 US Gallon = 3.8 Liters.

Special note re: analyses: BTEX, NWTPH-Dx with AND without SGC, RCRA8 + MNA for metals

Groundwater Purge and Sample Form (Minimal Drawdown)

Kennedy/Jenks Consultants

Date: 8-27-18
 Project Name: BNSF Wishram
 Project Number: 1896120*05
 Sampling Personnel: Robinson
 Water Level Meter: Solinst or Geotech OWI
 Purging Equipment: Peristaltic Pump, Tubing
 Sampling Equipment: Peristaltic Pump, Tubing
 Sampling Time: 10:16
 Total Discharge (gal): _____
 Water Disposal: On-Site 55-gallon drums

Well Number: WMW-23
 Monument Type: Stickup: _____ (ft PVC) Flush:
 Well Diameter (in): 2-inch PVC
 Well Condition: _____
 Total Casing Depth (ft): 21.5
 Screened Interval (ft): 11.5-21.5
 Purge Depth (ft): _____
 Depth to Groundwater (ft): 14.68'
 Depth to LNAPL (ft): _____
 Water Column (ft): _____

Weather: Sunny, clear

Water Quality Meter(s)	Model	Calibration Date/Time	QA/QC Samples		
Temp/pH/SC/ORP/DO:	YSI 556	<u>8-20-18 400</u>	Type	Sample ID	Time
Turbidity:	Micro TPI				
Other:					

Sample ID	Sample Containers				Field Filtered	Analyses Requested (X)		MS/MSD & Comments
	No.	Type	Pres.	Vol.				
	2	VOA	HCl	40 mL	No	BTEX (8260)	X	
	2	VOA	HCl	40 mL	No	NWTPH-Gx		
	2	VOA	HCl	40 mL	No	NWTPH-Dx NO SGC	X	
	2	VOA	HCl	40 mL	No	NWTPH-Dx WITH SGC		
	2	VOA	-	40 mL	No	PAHs (8270 SIM)	X	
	2	VOA	HCl	40 mL	No	Methane (RSK 175)	X	
	1	HDPE	H2SO4	250 mL	No	Nitrate-Nitrite (353.2) & Ammonia (350.1/350.3)	X	
	1	HDPE	none	125 mL	No	Sulfate (300.0)	X	
	1	HDPE	NaOH/ZnAc	125 mL	No	Sulfide (376.2)	X	
	1	HDPE	HNO3	250 mL	No	Tot. Metals (RCRA8) (6020)	X	
	1	HDPE	HNO3	250 mL	Yes	Diss. Metals (RCRA8, Mn, Fe)	X	

Total Containers **13**

Time	9:38	9:43	9:48	9:53	9:58	10:03	10:08	
Parameter (every 5 min)	min	min	min	min	min	min	min	min
Flow Rate (L/min)	~.2	~.2	~.2	~.2	~.2	~.2	~.2	
Volume Purged (Liters)	~1	~2	~3	~4	~5	~6	~7	
Water Depth (ft)	14.69	14.69	14.69	14.69	14.69	14.69	14.69	
Temperature (°C), (± 0.2)	18.23	18.17	18.09	18.29	17.99	18.27	18.16	
pH, (± 0.1)	7.01	6.94	7.18	7.44	7.51	7.99	7.59	
Sp. Conductance (uS/cm), (± 3%)	792	794	795	793	792	792	791	
DO (mg/L), (± 10% or 10% of 0.2mg/l)	0.51	0.36	0.30	0.28	0.25	0.23	0.22	
ORP (mV), (± 10%)	108.5	92.8	67.0	42.1	31.5	16.1	14.7	
Turbidity (NTU), (± 10% or 3 <10 NTUs)	3.12	2.45	2.32	1.48	2.17	3.11	4.18	
Color	clr	clr	clr	clr	clr	clr	clr	
Odor/Evidence of LNAPL	mid odor		none	none	none	none	none	

Notes: (i.e. actions taken if well dewaterers, difficulties in sampling through LNAPL, problems during purging/sampling, etc.)

1 US Gallon = 3.8 Liters.

Special note re: analyses: BTEX, RCRA8 + MNA for metals

Groundwater Purge and Sample Form (Minimal Drawdown)

Kennedy/Jenks Consultants

Date: 8-30-18
 Project Name: BNSF Wishram
 Project Number: 1896120*05
 Sampling Personnel: Robinson
 Water Level Meter: Solinst or Geotech OWI
 Purging Equipment: Peristaltic Pump, Tubing
 Sampling Equipment: Peristaltic Pump, Tubing
 Sampling Time: 9:25
 Total Discharge (gal): _____
 Water Disposal: On-Site 55-gallon drums

Well Number: WMW-24
 Monument Type: Stickup: _____ (ft PVC) Flush:
 Well Diameter (in): 2-inch PVC
 Well Condition: good
 Total Casing Depth (ft): 17.0
 Screened Interval (ft): 7-17
 Purge Depth (ft): 15'
 Depth to Groundwater (ft): 11.12
 Depth to LNAPL (ft): _____
 Water Column (ft): _____

TOC

Weather: partly cloudy

Water Quality Meter(s)	Model	Calibration Date/Time	QA/QC Samples		
Temp/pH/SC/ORP/DO:	YSI 556		Type	Sample ID	Time
Turbidity:	Micro TPI				
Other:					

Sample ID	Sample Containers				Field Filtered	Analyses Requested (X)	MS/MSD & Comments
	No.	Type	Pres.	Vol.			
	<u>23</u>	VOA	HCl	40 mL	No	VOCs (8260)	X
	2	VOA	HCl	40 mL	No	NWTPH-Gx	
	2	VOA	HCl	40 mL	No	NWTPH-Dx NO SGC	X
	2	VOA	HCl	40 mL	No	NWTPH-Dx WITH SGC	
	2	VOA	-	40 mL	No	PAHs (8270 SIM)	X
	2	VOA	HCl	40 mL	No	Methane (RSK 175)	X
	1	HDPE	H2SO4	250 mL	No	Nitrate-Nitrite (353.2) & Ammonia (350.1/350.3)	X
	1	HDPE	none	125 mL	No	Sulfate (300.0)	X
	1	HDPE	NaOH/ZnAc	125 mL	No	Sulfide (376.2)	X
	1	HDPE	HNO3	250 mL	No	Tot. Metals (RCRA8) (6020)	X
1	HDPE	HNO3	250 mL	Yes	Diss. Metals (RCRA8, Mn, Fe)	X	

Total Containers 18/4

Parameter (every 5 min)	Time 9:07	9:12	9:17	9:22				
	min	min	min	min	min	min	min	min
Flow Rate (L/min)	<u>~.2</u>	<u>~.2</u>	<u>~.2</u>	<u>~.2</u>				
Volume Purged (Liters)	<u>~1</u>	<u>~2</u>	<u>~3</u>	<u>~4</u>				
Water Depth (ft)	<u>11.80</u>	<u>11.84</u>	<u>11.99</u>	<u>11.98</u>				
Temperature (°C), (± 0.2)	<u>19.04</u>	<u>19.18</u>	<u>19.22</u>	<u>19.27</u>				
pH, (± 0.1)	<u>7.74</u>	<u>7.66</u>	<u>7.61</u>	<u>7.54</u>				
Sp. Conductance (uS/cm), (± 3%)	<u>596</u>	<u>597</u>	<u>593</u>	<u>578</u>				
DO (mg/L), (± 10% or 10% of 0.2mg/l)	<u>1.74</u>	<u>1.21</u>	<u>1.36</u>	<u>1.42</u>				
ORP (mV), (± 10%)	<u>99.2</u>	<u>101.3</u>	<u>108.9</u>	<u>115.6</u>				
Turbidity (NTU), (± 10% or 3 <10 NTUs)	<u>16.02</u>	<u>3.74</u>	<u>2.62</u>	<u>2.79</u>				
Color	<u>clear</u>	<u>clear</u>	<u>clear</u>	<u>clear</u>				
Odor/Evidence of LNAPL	<u>none</u>	<u>none</u>	<u>none</u>	<u>none</u>				

Notes: (i.e. actions taken if well dewaterers, difficulties in sampling through LNAPL, problems during purging/sampling, etc.)

1 US Gallon = 3.8 Liters.

Special note re: analyses: Full VOCs list, RCRA8 + MNA for metals

Groundwater Purge and Sample Form (Minimal Drawdown)

Kennedy/Jenks Consultants

Date: 8-29-18
 Project Name: BNSF Wishram
 Project Number: 1896120*05
 Sampling Personnel: Robinson
 Water Level Meter: Solinst or Geotech OWI
 Purging Equipment: Peristaltic Pump, Tubing
 Sampling Equipment: Peristaltic Pump, Tubing
 Sampling Time: 11:30
 Total Discharge (gal): _____
 Water Disposal: On-Site 55-gallon drums

Well Number: WMW-26
 Monument Type: Stickup: _____ (ft PVC) Flush: X
 Well Diameter (in): 2-inch PVC
 Well Condition: good
 Total Casing Depth (ft): 17.0
 Screened Interval (ft): 7-17
 Purge Depth (ft): _____
 Depth to Groundwater (ft): 11.18
 Depth to LNAPL (ft): _____
 Water Column (ft): _____

TOC

Weather: sunny, clear

Water Quality Meter(s)	Model	Calibration Date/Time	QA/QC Samples		
Temp/pH/SC/ORP/DO:	YSI 556	<u>8-29-18 4p</u>	Type	Sample ID	Time
Turbidity:	Micro TPI		Duplicate	<u>D-1-2018</u>	--
Other:					

Sample ID	Sample Containers				Field Filtered	Analyses Requested (X)		MS/MSD & Comments
	No.	Type	Pres.	Vol.				
	<u>23</u>	VOA	HCl	40 mL	No	VOCs (8260)	X	
	2	VOA	HCl	40 mL	No	NWTPH-Gx		
	2	VOA	HCl	40 mL	No	NWTPH-Dx NO SGC	X	
	2	VOA	HCl	40 mL	No	NWTPH-Dx WITH SGC	X	
	2	VOA	--	40 mL	No	PAHs (8270 SIM)	X	
	2	VOA	HCl	40 mL	No	Methane (RSK 175)	X	
	1	HDPE	H2SO4	250 mL	No	Nitrate-Nitrite (353.2) & Ammonia (350.1/350.3)	X	
	1	HDPE	none	125 mL	No	Sulfate (300.0)	X	
	1	HDPE	NaOH/ZnAc	125 mL	No	Sulfide (376.2)	X	
	1	HDPE	HNO3	250 mL	No	Tot. Metals (RCRA8) (6020)	X	
	1	HDPE	HNO3	250 mL	Yes	Diss. Metals (RCRA8, Mn, Fe)	X	

Total Containers 1516

Time	12:17	12:22	12:27	17:56				
Parameter (every 5 min)	min	min	min	min	min	min	min	min
Flow Rate (L/min)	<u>~.2</u>	<u>~.2</u>	<u>~.2</u>					
Volume Purged (Liters)	<u>~1</u>	<u>~2</u>	<u>~3</u>					
Water Depth (ft)	<u>11.48</u>	<u>12.09</u>	<u>13.06</u>					
Temperature (°C), (± 0.2)	<u>22.36</u>	<u>22.21</u>	<u>21.99</u>	<u>21.83</u>				
pH, (± 0.1)	<u>7.34</u>	<u>7.31</u>	<u>7.28</u>	<u>7.25</u>				
Sp. Conductance (uS/cm), (± 3%)	<u>530</u>	<u>548</u>	<u>567</u>	<u>610</u>				
DO (mg/L), (± 10% or 10% of 0.2mg/l)	<u>2.45</u>	<u>2.05</u>	<u>1.82</u>	<u>3.93</u>				
ORP (mV), (± 10%)	<u>94.6</u>	<u>94.0</u>	<u>92.9</u>	<u>115.2</u>				
Turbidity (NTU), (± 10% or 3 < 10 NTUs)	<u>30.29</u>	<u>29.49</u>	<u>22.68</u>					
Color	<u>clear w/ white particles</u>	<u>→</u>						
Odor/Evidence of LNAPL	<u>none</u>	<u>→</u>						

Notes: (i.e. actions taken if well dewater, difficulties in sampling through LNAPL, problems during purging/sampling, etc.)
 1 US Gallon = 3.8 Liters. dewatered well after 12:27. 12:42 - well fully dewatered, at 17:26, water level = 11.23'
 Special note re: analyses: Full VOCs list, NWTPH-Dx with AND without SGC, RCRA8 + MNA for metals
Sampled.

Groundwater Purge and Sample Form (Minimal Drawdown)

Kennedy/Jenks Consultants

Date: 8-30-18
 Project Name: BNSF Wishram
 Project Number: 1896120*05
 Sampling Personnel: Robins et al
 Water Level Meter: Solinst or Geotech OWI
 Purging Equipment: Peristaltic Pump, Tubing
 Sampling Equipment: Peristaltic Pump, Tubing
 Sampling Time: 14:15
 Total Discharge (gal): _____
 Water Disposal: On-Site 55-gallon drums

Well Number: WMW-27
 Monument Type: Stickup: _____ (ft PVC) Flush:
 Well Diameter (in): 2-inch PVC
 Well Condition: good
 Total Casing Depth (ft): 17.0
 Screened Interval (ft): 7-17
 Purge Depth (ft): 15'
 Depth to Groundwater (ft): 10.02
 Depth to LNAPL (ft): _____
 Water Column (ft): _____

TOC

Weather: partly cloudy

Water Quality Meter(s)	Model	Calibration Date/Time	QA/QC Samples		
Temp/pH/SC/ORP/DO:	YSI 556	<u>8-20-18 4p</u>	Type	Sample ID	Time
Turbidity:	Micro TPI		<u>MS</u>		
Other:			<u>MSD</u>		

Sample ID	Sample Containers				Field Filtered	Analyses Requested (X)		MS/MSD & Comments
	No.	Type	Pres.	Vol.				
	2	VOA	HCl	40 mL	No	VOCs (8260)	X	
	2	VOA	HCl	40 mL	No	NWTPH-Gx		
	2	VOA	HCl	40 mL	No	NWTPH-Dx NO SGC	X	
	2	VOA	HCl	40 mL	No	NWTPH-Dx WITH SGC		
	2	VOA	-	40 mL	No	PAHs (8270 SIM)	X	
	2	VOA	HCl	40 mL	No	Methane (RSK 175)	X	
	1	HDPE	H2SO4	250 mL	No	Nitrate-Nitrite (353.2) & Ammonia (350.1/350.3)	X	
	1	HDPE	none	125 mL	No	Sulfate (300.0)	X	
	1	HDPE	NaOH/ZnAc	125 mL	No	Sulfide (376.2)	X	
	1	HDPE	HNO3	250 mL	No	Tot. Metals (RCRA8) (6020)	X	
	1	HDPE	HNO3	250 mL	Yes	Diss. Metals (RCRA8, Mn, Fe)	X	

Total Containers **13**

Parameter (every 5 min)	Time	13:58	14:03	14:08	14:13				
		min	min	min	min	min	min	min	min
Flow Rate (L/min)		<u>~.2</u>	<u>~.2</u>	<u>~.2</u>	<u>~.2</u>				
Volume Purged (Liters)		<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>				
Water Depth (ft)		<u>10.69</u>	<u>10.89</u>	<u>11.02</u>	<u>11.02</u>				
Temperature (°C), (± 0.2)		<u>20.60</u>	<u>20.62</u>	<u>20.56</u>	<u>20.54</u>				
pH, (± 0.1)		<u>7.78</u>	<u>7.63</u>	<u>7.61</u>	<u>7.59</u>				
Sp. Conductance (uS/cm), (± 3%)		<u>329</u>	<u>322</u>	<u>321</u>	<u>319</u>				
DO (mg/L), (± 10% or 10% of 0.2mg/l)		<u>2.32</u>	<u>1.40</u>	<u>1.29</u>	<u>1.19</u>				
ORP (mV), (± 10%)		<u>124.4</u>	<u>123.4</u>	<u>121.6</u>	<u>120.7</u>				
Turbidity (NTU), (± 10% or 3 <10 NTUs)		<u>3.47</u>	<u>5.55</u>	<u>3.76</u>	<u>2.83</u>				
Color		<u>clear</u>	<u>clear</u>	<u>clear</u>	<u>clear</u>				
Odor/Evidence of LNAPL		<u>none</u>	<u>none</u>	<u>none</u>	<u>none</u>				

Notes: (i.e. actions taken if well dewaterers, difficulties in sampling through LNAPL, problems during purging/sampling, etc.)

1 US Gallon = 3.8 Liters.

Special note re: analyses: Full VOCs list, RCRA8 + MNA for metals

Groundwater Purge and Sample Form (Minimal Drawdown)

Kennedy/Jenks Consultants

Date: 8-29-18
 Project Name: BNSF Wishram
 Project Number: 1896120*05
 Sampling Personnel: Roberson
 Water Level Meter: Solinst or Geotech OWI
 Purging Equipment: Peristaltic Pump, Tubing
 Sampling Equipment: Peristaltic Pump, Tubing
 Sampling Time: 10:27
 Total Discharge (gal): _____
 Water Disposal: On-Site 55-gallon drums
 Weather: clear

Well Number: WMW-28
 Monument Type: Stickup: _____ (ft PVC) Flush:
 Well Diameter (in): 2-inch PVC
 Well Condition: Good
 Total Casing Depth (ft): 17.0
 Screened Interval (ft): 7-17
 Purge Depth (ft): 18'
 Depth to Groundwater (ft): 10.62
 Depth to LNAPL (ft): _____
 Water Column (ft): _____

TOC

Water Quality Meter(s)	Model	Calibration Date/Time	QA/QC Samples		
Temp/pH/SC/ORP/DO:	YSI 556	<u>10-20-18 4y</u>	Type	Sample ID	Time
Turbidity:	Micro TPI		<u>Dup</u>	<u>D-1-20180829</u>	<u>10:45</u>
Other:					

Sample ID	Sample Containers				Field Filtered	Analyses Requested (X)	MS/MSD & Comments
	No.	Type	Pres.	Vol.			
	<u>23</u>	VOA	HCl	40 mL	No	VOCs (8260)	X
	2	VOA	HCl	40 mL	No	NWTPH-Gx	
	2	VOA	HCl	40 mL	No	NWTPH-Dx NO SGC	X
	2	VOA	HCl	40 mL	No	NWTPH-Dx WITH SGC	
	2	VOA	-	40 mL	No	PAHs (8270 SIM)	X
	2	VOA	HCl	40 mL	No	Methane (RSK 175)	X
	1	HDPE	H2SO4	250 mL	No	Nitrate-Nitrite (353.2) & Ammonia (350.1/350.3)	X
	1	HDPE	none	125 mL	No	Sulfate (300.0)	X
	1	HDPE	NaOH/ZnAc	125 mL	No	Sulfide (376.2)	X
	1	HDPE	HNO3	250 mL	No	Tot. Metals (RCRA8) (6020)	X
1	HDPE	HNO3	250 mL	Yes	Diss. Metals (RCRA8, Mn, Fe)	X	

Total Containers 23/4

Time	10:02	10:07	10:12	10:17	10:22	10:27		
Parameter (every 5 min)	min	min	min	min	min	min	min	min
Flow Rate (L/min)	<u>~2</u>	<u>~2</u>	<u>~2</u>	<u>~2</u>	<u>~2</u>	<u>~2</u>		
Volume Purged (Liters)	<u>~1</u>	<u>~2</u>	<u>~3</u>	<u>~4</u>	<u>~6</u>	<u>7</u>		
Water Depth (ft)	<u>10.36</u>	<u>10.36</u>	<u>10.36</u>	<u>10.36</u>	<u>10.36</u>	<u>10.36</u>		
Temperature (°C), (± 0.2)	<u>18.38</u>	<u>18.82</u>	<u>18.86</u>	<u>18.62</u>	<u>18.74</u>	<u>18.83</u>		
pH, (± 0.1)	<u>7.18</u>	<u>7.43</u>	<u>7.53</u>	<u>7.57</u>	<u>7.58</u>	<u>7.58</u>		
Sp. Conductance (uS/cm), (± 3%)	<u>426</u>	<u>433</u>	<u>433</u>	<u>428</u>	<u>428</u>	<u>427</u>		
DO (mg/L), (± 10% or 10% of 0.2mg/l)	<u>0.60</u>	<u>0.43</u>	<u>0.36</u>	<u>0.31</u>	<u>0.30</u>	<u>0.31</u>		
ORP (mV), (± 10%)	<u>94.7</u>	<u>79.8</u>	<u>75.6</u>	<u>76.0</u>	<u>74.4</u>	<u>73.5</u>		
Turbidity (NTU), (± 10% or 3 <10 NTUs)	<u>55.11</u>	<u>33.50</u>	<u>24.02</u>	<u>20.92</u>	<u>15.85</u>	<u>14.21</u>		
Color	<u>milk</u>	<u>clear</u>	<u>clear</u>	<u>clear</u>	<u>clear</u>	<u>clear</u>		
Odor/Evidence of LNAPL	<u>none</u>	<u>none</u>	<u>none</u>	<u>none</u>	<u>none</u>	<u>none</u>		

Notes: (i.e. actions taken if well dewaterers, difficulties in sampling through LNAPL, problems during purging/sampling, etc.)

1 US Gallon = 3.8 Liters.

Special note re: analyses: Full VOCs list, RCRA8 + MNA for metals

Groundwater Purge and Sample Form (Minimal Drawdown)

Kennedy/Jenks Consultants

Date: 8-31-18
 Project Name: BNSF Wishram
 Project Number: 1896120*05
 Sampling Personnel: Robinson
 Water Level Meter: Solinst or Geotech OWI
 Purging Equipment: Peristaltic Pump, Tubing
 Sampling Equipment: Peristaltic Pump, Tubing
 Sampling Time: 9:10
 Total Discharge (gal): _____
 Water Disposal: On-Site 55-gallon drums

Well Number: WMW-29
 Monument Type: Stickup: _____ (ft PVC) Flush:
 Well Diameter (in): 2-inch PVC
 Well Condition: good
 Total Casing Depth (ft): 17.0
 Screened Interval (ft): 7-17
 Purge Depth (ft): 151
 Depth to Groundwater (ft): 11.21
 Depth to LNAPL (ft): —
 Water Column (ft): _____

TOC

Weather: sun, clear

Water Quality Meter(s)	Model	Calibration Date/Time	QA/QC Samples		
Temp/pH/SC/ORP/DO:	YSI 556	8-20-18 Yp	Type	Sample ID	Time
Turbidity:	Micro TPI				
Other:					

Sample ID	Sample Containers				Field Filtered	Analyses Requested (X)		MS/MSD & Comments
	No.	Type	Pres.	Vol.				
	2	VOA	HCl	40 mL	No	VOCs (8260)	X	
	2	VOA	HCl	40 mL	No	NWTPH-Gx		
	2	VOA	HCl	40 mL	No	NWTPH-Dx NO SGC	X	
	2	VOA	HCl	40 mL	No	NWTPH-Dx WITH SGC		
	2	VOA	—	40 mL	No	PAHs (8270 SIM)	X	
	2	VOA	HCl	40 mL	No	Methane (RSK 175)	X	
	1	HDPE	H2SO4	250 mL	No	Nitrate-Nitrite (353.2) & Ammonia (350.1/350.3)	X	
	1	HDPE	none	125 mL	No	Sulfate (300.0)	X	
	1	HDPE	NaOH/ZnAc	125 mL	No	Sulfide (376.2)	X	
	1	HDPE	HNO3	250 mL	No	Tot. Metals (RCRA8) (6020)	X	
	1	HDPE	HNO3	250 mL	Yes	Diss. Metals (RCRA8, Mn, Fe)	X	

Total Containers **13**

Time	7:55	8:00	8:05	8:10	9:30				
Parameter (every 5 min)	min	min	min	min	min	min	min	min	min
Flow Rate (L/min)	~.2	~.2	~.2	~.2	.				
Volume Purged (Liters)	~1	~2	~3	~4					
Water Depth (ft)	12.02	12.47	12.75	13.11					
Temperature (°C), (± 0.2)	18.92	18.96	19.14	19.31	19.53				
pH, (± 0.1)	7.11	7.04	7.03	7.03	7.08				
Sp. Conductance (uS/cm), (± 3%)	1339	1334	1321	1310	1323				
DO (mg/L), (± 10% or 10% of 0.2mg/l)	2.05	1.58	1.40	1.34	3.19				
ORP (mV), (± 10%)	79.2	72.2	73.9	69.2	62.2				
Turbidity (NTU), (± 10% or 3 <10 NTUs)	2.64	4.60	3.92	2.96					
Color	clear	clear	clear	clear	clr				
Odor/Evidence of LNAPL	none	none	none	mild note	mild				

Notes: (i.e. actions taken if well dewaterers, difficulties in sampling through LNAPL, problems during purging/sampling, etc.)

1 US Gallon = 3.8 Liters. fully dewatered well after 8:10. At 9:10, had recovered to 11.62'
 Special note re: analyses: Full VOCs list, RCRA8 + MNA for metals sampled

Groundwater Purge and Sample Form (Minimal Drawdown)

Kennedy/Jenks Consultants

Date: 8-28-18 purged / 8-29-18 sampled Well Number: WMW-30
 Project Name: BNSF Wishram Monument Type: Stickup: (ft PVC) Flush: X
 Project Number: 1896120*05 Well Diameter (in): 2-inch PVC
 Sampling Personnel: Robinson Well Condition: good
 Water Level Meter: Solinst or Geotech OWI Total Casing Depth (ft): 17.0
 Purging Equipment: Peristaltic Pump, Tubing Screened Interval (ft): 7-17
 Sampling Equipment: Peristaltic Pump, Tubing Purge Depth (ft): 15'
 Sampling Time: 8-29-18 16:40 Depth to Groundwater (ft): 10.5' **TOC**
 Total Discharge (gal): _____ Depth to LNAPL (ft): _____
 Water Disposal: On-Site 55-gallon drums Water Column (ft): _____
 Weather: sunny, clear

Water Quality Meter(s)	Model	Calibration Date/Time	QA/QC Samples		
Temp/pH/SC/ORP/DO:	YSI 556	<u>8-20-18 4p</u>	Type	Sample ID	Time
Turbidity:	Micro TPI		MS	WMW-30-2018-28 MS	
Other:			MSD	WMW-30-2018-28 MSD	

Sample ID	Sample Containers				Field Filtered	Analyses Requested (X)	MS/MSD & Comments
	No.	Type	Pres.	Vol.			
	2	VOA	HCl	40 mL	No	VOCs (8260)	X
	2	VOA	HCl	40 mL	No	NWTPH-Gx	
	2	VOA	HCl	40 mL	No	NWTPH-Dx NO SGC	X
	2	VOA	HCl	40 mL	No	NWTPH-Dx WITH SGC	X
	2	VOA	-	40 mL	No	PAHs (8270 SIM)	X
	2	VOA	HCl	40 mL	No	Methane (RSK 175)	X
	1	HDPE	H2SO4	250 mL	No	Nitrate-Nitrite (353.2) & Ammonia (350.1/350.3)	X
	1	HDPE	none	125 mL	No	Sulfate (300.0)	X
	1	HDPE	NaOH/ZnAc	125 mL	No	Sulfide (376.2)	X
	1	HDPE	HNO3	250 mL	No	Tot. Metals (RCRA8) (6020)	X
	1	HDPE	HNO3	250 mL	Yes	Diss. Metals (RCRA8, Mn, Fe)	X

Total Containers **15**

Time	17:11	17:16	17:21	17:26	17:31	17:36	8-29-18 9:13
Parameter (every 5 min)	min	min	min	min	min	min	min
Flow Rate (L/min)	~2	~2	~2	~2	~2	~2	
Volume Purged (Liters)	~1	~2	~3	~4	~5	~8	
Water Depth (ft)	12.06'	12.67'	13.12'	13.56	13.80	14.22	
Temperature (°C), (± 0.2)	19.42	19.65	19.54	19.31	19.29	19.09	22.86
pH, (± 0.1)	7.32	7.39	7.47	7.51	7.55	7.52	7.72
Sp. Conductance (uS/cm), (± 3%)	518	915	520	924	928	929	924
DO (mg/L), (± 10% or 10% of 0.2mg/l)	0.81	0.37	1.13	1.45	1.32	1.27	2.70
ORP (mV), (± 10%)	88.3	81.7	60.3	38.2	32.6	31.7	94.0
Turbidity (NTU), (± 10% or 3 <10 NTUs)	29.01	10.06	4.52	3.67	5.25	4.28	
Color	small white particles		clear				
Odor/Evidence of LNAPL	None						

Notes: (i.e. actions taken if well dewaterers, difficulties in sampling through LNAPL, problems during purging/sampling, etc.)
 1 US Gallon = 3.8 Liters. dewatered well after 17:36. 16:35 on 8-29; water level 10.52'. Sampled water in well.
 Special note re: analyses: Full VOCs list, NWTPH-Dx with AND without SGC, RCRA8 + MNA for metals
Briefly observed transient trace seen in cap during sampling.

Groundwater Purge and Sample Form (Minimal Drawdown)

Kennedy/Jenks Consultants

Date: 8-28-18
 Project Name: BNSF Wishram
 Project Number: 1896120*05
 Sampling Personnel: Robinson
 Water Level Meter: Solinst or Geotech OWI
 Purging Equipment: Peristaltic Pump, Tubing
 Sampling Equipment: Peristaltic Pump, Tubing
 Sampling Time: 10:00
 Total Discharge (gal): _____
 Water Disposal: On-Site 55-gallon drums

Well Number: WMW-31
 Monument Type: Stickup: _____ (ft PVC) Flush: X
 Well Diameter (in): 2-inch PVC
 Well Condition: good
 Total Casing Depth (ft): 17.0
 Screened Interval (ft): 7-17
 Purge Depth (ft): 19'
 Depth to Groundwater (ft): 10.53
 Depth to LNAPL (ft): _____
 Water Column (ft): _____

TOC

Weather: Sunny, clear

Water Quality Meter(s)	Model	Calibration Date/Time	QA/QC Samples		
Temp/pH/SC/ORP/DO:	YSI 556		Type	Sample ID	Time
Turbidity:	Micro TPI				
Other:					

Sample ID	Sample Containers				Field Filtered	Analyses Requested (X)		MS/MSD & Comments
	No.	Type	Pres.	Vol.				
	2	VOA	HCl	40 mL	No	VOCs (8260)	X	
	2	VOA	HCl	40 mL	No	NWTPH-Gx		
	2	VOA	HCl	40 mL	No	NWTPH-Dx NO SGC	X	
	2	VOA	HCl	40 mL	No	NWTPH-Dx WITH SGC		
	2	VOA	-	40 mL	No	PAHs (8270 SIM)	X	
	2	VOA	HCl	40 mL	No	Methane (RSK 175)	X	
	1	HDPE	H2SO4	250 mL	No	Nitrate-Nitrite (353.2) & Ammonia (350.1/350.3)	X	
	1	HDPE	none	125 mL	No	Sulfate (300.0)	X	
	1	HDPE	NaOH/ZnAc	125 mL	No	Sulfide (376.2)	X	
	1	HDPE	HNO3	250 mL	No	Tot. Metals (RCRA8) (6020)	X	
1	HDPE	HNO3	250 mL	Yes	Diss. Metals (RCRA8, Mn, Fe)	X		

Total Containers 18/4

Time	9:45	9:50	9:55	10:00				
Parameter (every 5 min)	min	min	min	min	min	min	min	min
Flow Rate (L/min)	~.2	~.2	~.2	~.2				
Volume Purged (Liters)	~1	~2	~3	~9				
Water Depth (ft)	10.94	10.95	10.94	10.95				
Temperature (°C), (± 0.2)	18.52	18.62	18.53	18.44				
pH, (± 0.1)	7.46	7.41	7.39	7.35				
Sp. Conductance (uS/cm), (± 3%)	794	808	818	830				
DO (mg/L), (± 10% or 10% of 0.2mg/l)	0.70	0.36	0.27	0.29				
ORP (mV), (± 10%)	86.2	83.1	80.2	79.3				
Turbidity (NTU), (± 10% or 3 <10 NTUs)	4.79	63.80	21.48	24.37				
Color	small white particles			clear				
Odor/Evidence of LNAPL	none							

Notes: (i.e. actions taken if well dewaterers, difficulties in sampling through LNAPL, problems during purging/sampling, etc.)

1 US Gallon = 3.8 Liters.

Special note re: analyses: Full VOCs list, RCRA8 + MNA for metals

Groundwater Purge and Sample Form (Minimal Drawdown)

Kennedy/Jenks Consultants

Date: 8-28-15
 Project Name: BNSF Wishram
 Project Number: 1896120*05
 Sampling Personnel:
 Water Level Meter: Solinst or Geotech OWI
 Purging Equipment: Peristaltic Pump, Tubing
 Sampling Equipment: Peristaltic Pump, Tubing
 Sampling Time: 15:35
 Total Discharge (gal): _____
 Water Disposal: On-Site 55-gallon drums
 Weather: sunny, clear

Well Number: WMW-32
 Monument Type: Stickup: _____ (ft PVC) Flush:
 Well Diameter (in): 2-inch PVC
 Well Condition:
 Total Casing Depth (ft): 17.0
 Screened Interval (ft): 7-17
 Purge Depth (ft): 15'
 Depth to Groundwater (ft): 16.20
 Depth to LNAPL (ft): —
 Water Column (ft): _____

TOC

Water Quality Meter(s)	Model	Calibration Date/Time	QA/QC Samples		
Temp/pH/SC/ORP/DO:	YSI 556	8-20-15 4p	Type	Sample ID	Time
Turbidity:	Micro TPI				
Other:					

Sample ID	Sample Containers				Field Filtered	Analyses Requested (X)		MS/MSD & Comments
	No.	Type	Pres.	Vol.				
23	2	VOA	HCl	40 mL	No	VOCs (8260)	X	
	2	VOA	HCl	40 mL	No	NWTPH-Gx	X	
	2	VOA	HCl	40 mL	No	NWTPH-Dx NO SGC	X	
	2	VOA	HCl	40 mL	No	NWTPH-Dx WITH SGC		
	2	VOA	—	40 mL	No	PAHs (8270 SIM)	X	
	2	VOA	HCl	40 mL	No	Methane (RSK 175)	X	
	1	HDPE	H2SO4	250 mL	No	Nitrate-Nitrite (353.2) & Ammonia (350.1/350.3)	X	
	1	HDPE	none	125 mL	No	Sulfate (300.0)	X	
	1	HDPE	NaOH/ZnAc	125 mL	No	Sulfide (376.2)	X	
	1	HDPE	HNO3	250 mL	No	Tot. Metals (RCRA8) (6020)	X	
1	HDPE	HNO3	250 mL	Yes	Diss. Metals (RCRA8, Mn, Fe)	X		

Total Containers 15/16

Time	8:16	8:21	8:26	8:49	8:54	8:59	9:04	9:09	16:0
Parameter (every 5 min)	min	min	min	min	min	min	min	min	min
Flow Rate (L/min)	~.2	~.2		~.2	~.2	~.2	~.2	~.2	
Volume Purged (Liters)	~1	~2		~3	~4	~5	~6	~7	
Water Depth (ft)	12.35	13.14	11.98	12.55	13.11	13.80	14.45	14.91	
Temperature (°C), (± 0.2)	19.25			18.79	18.84	18.99	19.06	18.81	20.06
pH, (± 0.1)	7.37			7.44	7.44	7.46	7.45	7.44	7.51
Sp. Conductance (uS/cm), (± 3%)	674			1160	1149	1025	967	974	895
DO (mg/L), (± 10% or 10% of 0.2mg/l)	1.26			1.12	0.43	0.58	0.88	0.83	0.96
ORP (mV), (± 10%)	84.3			98.3	99.1	91.7	90.0	88.9	66.4
Turbidity (NTU), (± 10% or 3 <10 NTUs)	1.95			5.25	6.41	7.21	4.39	5.62	not stable
Color	clr			clr	clr	clr	clr	clr	
Odor/Evidence of LNAPL	none			none	none	none	none	none	

Notes: (i.e. actions taken if well dewaterers, difficulties in sampling through LNAPL, problems during purging/sampling, etc.)
 1 US Gallon = 3.8 Liters. stopped pump @ 8:21 due to dewatering - called R. Holtzman, Restarted 8:44 ✓

Special note re: analyses: Full VOCs list, NWTPH-Gx, RCRA8 + MNA for metals
longer tube. At 9:11 well dewatered below purge depth. Dropped tube to well bottom + increased

Groundwater Purge and Sample Form (Minimal Drawdown)

Kennedy/Jenks Consultants

Date: 8/22/18
 Project Name: BNSF Wishram
 Project Number: 1896120*00
 Sampling Personnel: J. Schwarz
 Water Level Meter: Solinst or Geotech OWI
 Purging Equipment: Peristaltic Pump, Tubing
 Sampling Equipment: Peristaltic Pump, Tubing
 Sampling Time: 1515
 Total Discharge (gal): _____
 Water Disposal: On-Site 55-gallon drums

Well Number: RMD-1
 Monument Type: Stickup (ft PVC) Flush: X
 Well Diameter (in): 2
 Well Condition: good
 Total Casing Depth (ft): 44.5
 Screened Interval (ft): 29.6-44.6
 Purge Depth (ft): 37.5
 Depth to Groundwater (ft): 14.70
 Depth to LNAPL (ft): n/a
 Water Column (ft): _____

TOC

Weather: _____

Water Quality Meter(s)	Model	Calibration Date/Time	QA/QC Samples		
Temp/pH/SC/ORP/DO:	YSI 556	8/22/18	Type	Sample ID	Time
Turbidity:	Micro TPI				
Other:					

Sample ID	Sample Containers				Field Filtered	Analyses Requested (X)	MS/MSD & Comments
	No.	Type	Pres.	Vol.			
	2	VOA	HCl	40 mL	No	BTEX (8260)	
	2	VOA	HCl	40 mL	No	NWTPH-Gx	
	2	VOA	HCl	40 mL	No	NWTPH-Dx NO SGC	X
	2	VOA	HCl	40 mL	No	NWTPH-Dx WITH SGC	X
	2	VOA	-	40 mL	No	PAHs (8270 SIM)	X
	2	VOA	HCl	40 mL	No	Methane (RSK 175)	X
	1	HDPE	H2SO4	250 mL	No	Nitrate-Nitrite (353.2) & Ammonia (350.1/350.3)	X
	1	HDPE	none	125 mL	No	Sulfate (300.0)	X
	1	HDPE	NaOH/ZnAc	125 mL	No	Sulfide (376.2)	X
	1	HDPE	HNO3	250 mL	No	Tot. Metals (As) (6020)	
	1	HDPE	HNO3	250 mL	Yes	Diss. Metals (Mn,Fe)	X

Total Containers 12

	1430 Time	1435	1440	1445	1450	1455	1500	1505	1510
Parameter (every 5 min)	5 min	10 min	15 min	20 min	25 min	min	min	min	min
Flow Rate (L/min)	0.2								
Volume Purged (Liters)	1	2	3	4	5	6	7	8	
Water Depth (ft)	14.90	14.91	14.91	14.91	14.92	14.92	14.92	14.92	14.92
Temperature (°C), (± 0.2)	19.52	19.95	19.53	19.23	19.18	18.92	18.90	18.87	
pH, (± 0.1)	6.65	6.71	6.77	6.79	6.56	6.86	6.87	6.90	
Sp. Conductance (uS/cm), (± 3%)	1036	1031	1034	1028	1027	1026	1026	1028	
DO (mg/L), (± 10% or 10% of 0.2mg/l)	1.38	0.79	0.67	0.58	0.49	0.47	0.43	0.41	
ORP (mV), (± 10%)	-96.4	-115	-115.0	-115.8	-118.8	-118.0	-117.4	-117.6	
Turbidity (NTU), (± 10% or 3 <10 NTUs)	7.80	6.30	6.55	3.33	2.65	3.88	2.89	2.71	
Color	clear								
Odor/Evidence of LNAPL	none								

Notes: (i.e. actions taken if well dewater, difficulties in sampling through LNAPL, problems during purging/sampling, etc.)

1 US Gallon = 3.8 Liters.

Groundwater Purge and Sample Form (Minimal Drawdown)

Kennedy/Jenks Consultants

Date: 8-20-18
 Project Name: BNSF Wishram
 Project Number: 1896120*00
 Sampling Personnel: Robinson
 Water Level Meter: Solinst or Geotech OWI
 Purging Equipment: Peristaltic Pump, Tubing
 Sampling Equipment: Peristaltic Pump, Tubing
 Sampling Time: 17:05
 Total Discharge (gal): _____
 Water Disposal: On-Site 55-gallon drums

Well Number: RMD-2
 Monument Type: Stickup (ft PVC) Flush: X
 Well Diameter (in): 2
 Well Condition: good
 Total Casing Depth (ft): 58.0
 Screened Interval (ft): 30-50
 Purge Depth (ft): 40.0
 Depth to Groundwater (ft): 14.33
 Depth to LNAPL (ft): _____
 Water Column (ft): _____

TOC

Weather: _____

Water Quality Meter(s)	Model	Calibration Date/Time	QA/QC Samples		
Temp/pH/SC/ORP/DO:	YSI 556	<u>8-20-18 4</u>	Type	Sample ID	Time
Turbidity:	Micro TPI		Duplicate	D-2-201804	-
Other:					

Sample ID	Sample Containers				Field Filtered	Analyses Requested (X)	MS/MSD & Comments
	No.	Type	Pres.	Vol.			
	2	VOA	HCl	40 mL	No	BTEX (8260)	
	2	VOA	HCl	40 mL	No	NWTPH-Gx	
	2	VOA	HCl	40 mL	No	NWTPH-Dx NO SGC	X
	2	VOA	HCl	40 mL	No	NWTPH-Dx WITH SGC	X
	2	VOA	-	40 mL	No	PAHs (8270 SIM)	X
	2	VOA	HCl	40 mL	No	Methane (RSK 175)	X
	1	HDPE	H2SO4	250 mL	No	Nitrate-Nitrite (353.2) & Ammonia (350.1/350.3)	X
	1	HDPE	none	125 mL	No	Sulfate (300.0)	X
	1	HDPE	NaOH/ZnAc	125 mL	No	Sulfide (376.2)	X
	1	HDPE	HNO3	250 mL	No	Tot. Metals (As) (6020)	
	1	HDPE	HNO3	250 mL	Yes	Diss. Metals (Mn,Fe)	X

Total Containers 12

	Time	16:32	16:37	16:42	16:47	16:52	16:57	17:02
Parameter (every 5 min)		min	min	min	min	min	min	min
Flow Rate (L/min)		~.2	~.2	~.2	~.2	~.2	~.2	~.2
Volume Purged (Liters)		~1	~2	~3	~4	~5	~6	~7
Water Depth (ft)		14.36	14.36	14.36	14.36	14.37	14.37	14.37
Temperature (°C), (± 0.2)		21.06	20.52	20.10	19.94	19.92	20.02	20.07
pH, (± 0.1)		7.16	7.13	7.11	7.11	7.09	7.09	7.11
Sp. Conductance (uS/cm), (± 3%)		1176	1179	1179	1179	1178	1178	1178
DO (mg/L), (± 10% or 10% of 0.2mg/l)		1.58	0.84	0.55	0.61	0.48	0.33	0.29
ORP (mV), (± 10%)		-125.7	-115.0	-122.4	-122.7	-121.3	-117.2	-110.9
Turbidity (NTU), (± 10% or 3 <10 NTUs)		4.53	4.71	2.99	3.74	2.72	4.98	4.49
Color		ck						
Odor/Evidence of LNAPL		mild						

Notes: (i.e. actions taken if well dewater, difficulties in sampling through LNAPL, problems during purging/sampling, etc.)

1 US Gallon = 3.8 Liters.

Groundwater Purge and Sample Form (Minimal Drawdown)

Kennedy/Jenks Consultants

Date: 8-22-18
 Project Name: BNSF Wishram
 Project Number: 1896120*00
 Sampling Personnel: Robinson
 Water Level Meter: Solinst or Geotech OWI
 Purging Equipment: Peristaltic Pump, Tubing
 Sampling Equipment: Peristaltic Pump, Tubing
 Sampling Time: 13:00
 Total Discharge (gal): _____
 Water Disposal: On-Site 55-gallon drums

Well Number: RMD-3
 Monument Type: Stickup (ft PVC) Flush: X
 Well Diameter (in): 2
 Well Condition: good
 Total Casing Depth (ft): 60.0
 Screened Interval (ft): 40-60
 Purge Depth (ft): 50.0
 Depth to Groundwater (ft): 14.63
 Depth to LNAPL (ft): —
 Water Column (ft): _____

TOC

Weather: _____

Water Quality Meter(s)	Model	Calibration Date/Time	QA/QC Samples		
			Type	Sample ID	Time
Temp/pH/SC/ORP/DO:	YSI 556	8-20-18 4:00p			
Turbidity:	Micro TPI				
Other:					

Sample ID	Sample Containers				Field Filtered	Analyses Requested (X)	MS/MSD & Comments
	No.	Type	Pres.	Vol.			
	2	VOA	HCl	40 mL	No	BTEX (8260)	
	2	VOA	HCl	40 mL	No	NWTPH-Gx	
	2	VOA	HCl	40 mL	No	NWTPH-Dx NO SGC	X
	2	VOA	HCl	40 mL	No	NWTPH-Dx WITH SGC	
	2	VOA	—	40 mL	No	PAHs (8270 SIM)	X
	2	VOA	HCl	40 mL	No	Methane (RSK 175)	X
	1	HDPE	H2SO4	250 mL	No	Nitrate-Nitrite (353.2) & Ammonia (350.1/350.3)	X
	1	HDPE	none	125 mL	No	Sulfate (300.0)	X
	1	HDPE	NaOH/ZnAc	125 mL	No	Sulfide (376.2)	X
	1	HDPE	HNO3	250 mL	No	Tot. Metals (As) (6020)	
	1	HDPE	HNO3	250 mL	Yes	Diss.Metals (Mn,Fe)	X

Total Containers 10

	Time	12:38	12:43	12:48	12:53	12:58			
Parameter (every 5 min)	min	min	min	min	min	min	min	min	min
Flow Rate (L/min)		~.2	~.2	~.2	~.2	~.2			
Volume Purged (Liters)		1	2	3	4	5			
Water Depth (ft)		14.66	14.66	14.66	14.66	14.66			
Temperature (°C), (± 0.2)		20.04	19.83	19.96	19.92	20.45			
pH, (± 0.1)		7.47	7.43	7.42	7.42	7.42			
Sp. Conductance (uS/cm), (± 3%)		621	619	617	619	617			
DO (mg/L), (± 10% or 10% of 0.2mg/l)		1.51	0.69	0.51	0.45	0.41			
ORP (mV), (± 10%)		-128.3	-127.2	-132.6	-128.4	-135.1			
Turbidity (NTU), (± 10% or 3 <10 NTUs)		11.63	5.15	4.22	3.46	5.77			
Color		clr	clr	clr	clr	clr			
Odor/Evidence of LNAPL		mild odor							

Notes: (i.e. actions taken if well dewater, difficulties in sampling through LNAPL, problems during purging/sampling, etc.)

1 US Gallon = 3.8 Liters.

Groundwater Purge and Sample Form (Minimal Drawdown)

Kennedy/Jenks Consultants

Date: 8-22-18
 Project Name: BNSF Wishram
 Project Number: 1896120*00
 Sampling Personnel: Robinson
 Water Level Meter: Solinst or Geotech OWI
 Purging Equipment: Peristaltic Pump, Tubing
 Sampling Equipment: Peristaltic Pump, Tubing
 Sampling Time: 9:40
 Total Discharge (gal): _____
 Water Disposal: On-Site 55-gallon drums

Well Number: RMD-4
 Monument Type: Stickup: _____ (ft PVC) Flush:
 Well Diameter (in): 2
 Well Condition: good
 Total Casing Depth (ft): 65.0
 Screened Interval (ft): 45-65
 Purge Depth (ft): 55.0 53.0 AR
 Depth to Groundwater (ft): 14.62'
 Depth to LNAPL (ft): -
 Water Column (ft): _____

TOC

Weather: Sunny, clear

Water Quality Meter(s)	Model	Calibration Date/Time	QA/QC Samples		
Temp/pH/SC/ORP/DO:	YSI 556	<u>8-20-18 4:00p</u>	Type	Sample ID	Time
Turbidity:	Micro TPI				
Other:					

Sample ID	Sample Containers				Field Filtered	Analyses Requested (X)	MS/MSD & Comments
	No.	Type	Pres.	Vol.			
	2	VOA	HCl	40 mL	No	BTEX (8260)	
	2	VOA	HCl	40 mL	No	NWTPH-Gx	
	2	VOA	HCl	40 mL	No	NWTPH-Dx NO SGC	X
	2	VOA	HCl	40 mL	No	NWTPH-Dx WITH SGC	X
	2	VOA	-	40 mL	No	PAHs (8270 SIM)	X
	2	VOA	HCl	40 mL	No	Methane (RSK 175)	X
	1	HDPE	H2SO4	250 mL	No	Nitrate-Nitrite (353.2) & Ammonia (350.1/350.3)	X
	1	HDPE	none	125 mL	No	Sulfate (300.0)	X
	1	HDPE	NaOH/ZnAc	125 mL	No	Sulfide (376.2)	X
	1	HDPE	HNO3	250 mL	No	Tot. Metals (As) (6020)	
	1	HDPE	HNO3	250 mL	Yes	Diss. Metals (Mn, Fe)	X

Total Containers 12

Time	9:21	9:26	9:31	9:36	9:41			
Parameter (every 5 min)	min	min	min	min	min	min	min	min
Flow Rate (L/min)	~.2	~.2	~.2	~.2	~.2			
Volume Purged (Liters)	~1	~2	~3	~4	~5			
Water Depth (ft)	14.62	14.62	14.63	14.63	14.63			
Temperature (°C), (± 0.2)	19.02	18.05	17.76	17.67	17.63			
pH, (± 0.1)	7.40	7.38	7.36	7.35	7.35			
Sp. Conductance (uS/cm), (± 3%)	858	855	853	852	850			
DO (mg/L), (± 10% or 10% of 0.2mg/l)	1.41	0.65	0.43	0.37	0.39			
ORP (mV), (± 10%)	64.3	71.4	76.0	78.7	79.9			
Turbidity (NTU), (± 10% or 3 <10 NTUs)	4.32	3.99	5.40	5.29	3.26			
Color	clr	clr	clr	clr	clr			
Odor/Evidence of LNAPL	none	none	none	none	none			

Notes: (i.e. actions taken if well dewater, difficulties in sampling through LNAPL, problems during purging/sampling, etc.)

1 US Gallon = 3.8 Liters.

Groundwater Purge and Sample Form (Minimal Drawdown)

Kennedy/Jenks Consultants

Date: 8-30-18
 Project Name: BNSF Wishram
 Project Number: 1896120*05
 Sampling Personnel: Robinson
 Water Level Meter: Solinst or Geotech OWI
 Purging Equipment: Peristaltic Pump, Tubing
 Sampling Equipment: Peristaltic Pump, Tubing
 Sampling Time: 12:55
 Total Discharge (gal): _____
 Water Disposal: On-Site 55-gallon drums

Well Number: RMD-5
 Monument Type: Stickup: _____ (ft PVC) Flush:
 Well Diameter (in): 2-inch PVC
 Well Condition: good
 Total Casing Depth (ft): 45.0
 Screened Interval (ft): 30-45
 Purge Depth (ft): 325'
 Depth to Groundwater (ft): 14.70
 Depth to LNAPL (ft): —
 Water Column (ft): _____

Weather: partly cloudy

Water Quality Meter(s)	Model	Calibration Date/Time	QA/QC Samples		
Temp/pH/SC/ORP/DO:	YSI 556	<u>8-20-18</u>	Type	Sample ID	Time
Turbidity:	Micro TPI				
Other:					

Sample ID	Sample Containers				Field Filtered	Analyses Requested (X)		MS/MSD & Comments
	No.	Type	Pres.	Vol.				
	2	VOA	HCl	40 mL	No	BTEX (8260)	X	
	2	VOA	HCl	40 mL	No	NWTPH-Gx		
	2	VOA	HCl	40 mL	No	NWTPH-Dx NO SGC	X	
	2	VOA	HCl	40 mL	No	NWTPH-Dx WITH SGC	X	
	2	VOA	—	40 mL	No	PAHs (8270 SIM)	X	
	2	VOA	HCl	40 mL	No	Methane (RSK 175)	X	
	1	HDPE	H2SO4	250 mL	No	Nitrate-Nitrite (353.2) & Ammonia (350.1/350.3)	X	
	1	HDPE	none	125 mL	No	Sulfate (300.0)	X	
	1	HDPE	NaOH/ZnAc	125 mL	No	Sulfide (376.2)	X	
	1	HDPE	HNO3	250 mL	No	Tot. Metals (Pb only) (6020)	X	
	1	HDPE	HNO3	250 mL	Yes	Diss. Metals (Pb, Mn, Fe)	X	

Total Containers 15

Time	12:24	12:33	12:38	12:43	12:48	12:53		
Parameter (every 5 min)	min	min	min	min	min	min	min	min
Flow Rate (L/min)	~.2	~.2	~.2	~.2	~.2	~.2		
Volume Purged (Liters)	1	2	3	~4	~5	~6		
Water Depth (ft)	14.73	14.75	14.75	14.75	14.75	14.75		
Temperature (°C), (± 0.2)	19.28	19.35	19.37	19.39	18.94	18.87		
pH, (± 0.1)	7.86	7.42	7.31	7.43	7.41	7.32		
Sp. Conductance (uS/cm), (± 3%)	749	776	789	796	801	802		
DO (mg/L), (± 10% or 10% of 0.2mg/l)	4.04	2.33	1.96	1.77	1.69	1.67		
ORP (mV), (± 10%)	150.9	164.3	162.2	150.4	147.0	149.2		
Turbidity (NTU), (± 10% or 3 <10 NTUs)	8.39	8.88	14.62	12.16	9.25	8.36		
Color	clear	clear	clear	clear	clear	clear		
Odor/Evidence of LNAPL	none	none	none	none	none	none		

Notes: (i.e. actions taken if well dewaterers, difficulties in sampling through LNAPL, problems during purging/sampling, etc.)

1 US Gallon = 3.8 Liters.

Special note re: analyses: BTEX; NWTPH-Dx with AND without SGC; Lead + MNA for metals

turbidity appears to be due to bubbles

Groundwater Purge and Sample Form (Minimal Drawdown)

Kennedy/Jenks Consultants

Date: 8-30-18
 Project Name: BNSF Wishram
 Project Number: 1896120*05
 Sampling Personnel: Robinson
 Water Level Meter: Solinst or Geotech OWI
 Purging Equipment: Peristaltic Pump, Tubing
 Sampling Equipment: Peristaltic Pump, Tubing
 Sampling Time: 16:55
 Total Discharge (gal): _____
 Water Disposal: On-Site 55-gallon drums

Well Number: RMD-6
 Monument Type: Stickup: _____ (ft PVC) Flush:
 Well Diameter (in): 2-inch PVC
 Well Condition: good
 Total Casing Depth (ft): 65.0
 Screened Interval (ft): 45-65
 Purge Depth (ft): 55'
 Depth to Groundwater (ft): 14.61'
 Depth to LNAPL (ft): —
 Water Column (ft): _____

Weather: sunny, high winds

Water Quality Meter(s)	Model	Calibration Date/Time	QA/QC Samples		
Temp/pH/SC/ORP/DO:	YSI 556	<u>8-20-18 4p</u>	Type	Sample ID	Time
Turbidity:	Micro TPI				
Other:					

Sample ID	Sample Containers				Field Filtered	Analyses Requested (X)	MS/MSD & Comments
	No.	Type	Pres.	Vol.			
	2	VOA	HCl	40 mL	No	BTEX (8260)	X
	2	VOA	HCl	40 mL	No	NWTPH-Gx	
	2	VOA	HCl	40 mL	No	NWTPH-Dx NO SGC	X
	2	VOA	HCl	40 mL	No	NWTPH-Dx WITH SGC	X
	2	VOA	—	40 mL	No	PAHs (8270 SIM)	X
	2	VOA	HCl	40 mL	No	Methane (RSK 175)	X
	1	HDPE	H2SO4	250 mL	No	Nitrate-Nitrite (353.2) & Ammonia (350.1/350.3)	X
	1	HDPE	none	125 mL	No	Sulfate (300.0)	X
	1	HDPE	NaOH/ZnAc	125 mL	No	Sulfide (376.2)	X
	1	HDPE	HNO3	250 mL	No	Tot. Metals (RCRA8) (6020)	X
	1	HDPE	HNO3	250 mL	Yes	Diss. Metals (RCRA8, Mn, Fe)	X

Total Containers **15**

Time	16:33	16:38	16:43	16:48	16:53			
Parameter (every 5 min)	min	min	min	min	min	min	min	min
Flow Rate (L/min)	<u>~.2</u>	<u>~.2</u>	<u>~.2</u>	<u>~.2</u>	<u>~.2</u>			
Volume Purged (Liters)	<u>1</u>	<u>2</u>	<u>3</u>	<u>~4</u>	<u>~5</u>			
Water Depth (ft)	<u>14.62</u>	<u>14.62</u>	<u>14.62</u>	<u>14.62</u>	<u>14.62</u>			
Temperature (°C), (± 0.2)	<u>20.63</u>	<u>20.59</u>	<u>20.49</u>	<u>20.30</u>	<u>20.33</u>			
pH, (± 0.1)	<u>7.63</u>	<u>7.48</u>	<u>7.50</u>	<u>7.50</u>	<u>7.50</u>			
Sp. Conductance (uS/cm), (± 3%)	<u>779</u>	<u>836</u>	<u>860</u>	<u>881</u>	<u>889</u>			
DO (mg/L), (± 10% or 10% of 0.2mg/l)	<u>4.12</u>	<u>2.70</u>	<u>2.55</u>	<u>2.38</u>	<u>2.28</u>			
ORP (mV), (± 10%)	<u>114.8</u>	<u>117.4</u>	<u>116.0</u>	<u>114.2</u>	<u>113.7</u>			
Turbidity (NTU), (± 10% or 3 <10 NTUs)	<u>4.97</u>	<u>5.32</u>	<u>4.73</u>	<u>3.33</u>	<u>3.18</u>			
Color	<u>clear</u>	<u>clear</u>	<u>clear</u>	<u>clear</u>	<u>clear</u>			
Odor/Evidence of LNAPL	<u>none</u>	<u>none</u>	<u>none</u>	<u>none</u>	<u>none</u>			

Notes: (i.e. actions taken if well dewaterers, difficulties in sampling through LNAPL, problems during purging/sampling, etc.)

1 US Gallon = 3.8 Liters.

Special note re: analyses: BTEX, NWTPH-Dx with AND without SGC, RCRA8 + MNA for metals

5 to 7 November 2018

WATER TABLE/LNAPL THICKNESS MEASUREMENTS
BNSF WISHRAM

11/5/18

Monitoring Personnel:

KEE & BR

Well	Date / Time	Depth to LNAPL (feet btoc)	Depth to Water (feet btoc)	LNAPL Thickness (feet)	Well Status
OHM-2	11/5/18 ¹⁰⁵⁵	9.99	21.95		Good
OHM-1	In: 1347 Out: 1431	9.40	30.09		
OHM-3	In: 1205 Out: 1300	10.26	11.24		
OHM-4	1247	-	11.25		
RMD-1	1117	-	14.61	-	
RMD-2	1122	-	14.32	-	
RMD-3	1127	-	14.63	-	
RMD-4	1126	-	14.52	-	
RMD-5	1111	-	14.38	-	
RMD-6	1120	-	14.28	-	
WMW-1	1232	-	10.13	-	
WMW-3	1407	-	10.78	-	
WMW-5	1315	-	10.31	-	
WMW-7	1335	-	12.14	-	
WMW-8	1341	-	11.63	-	
WMW-9	1226	-	10.93	-	
WMW-10	1222	-	10.73	-	
WMW-11	1228	-	10.64	-	
WMW-12	1344	-	11.10	-	
WMW-13	1219	-	11.39	-	
WMW-14	1108	-	14.89	-	
WMW-15	1114	-	14.73	-	
WMW-16	1119	-	14.50	-	
WMW-17	1124	-	14.23	-	
WMW-18	1128	-	14.93	-	
WMW-19	1105	-	14.78	-	good
WMW-20	1123	-	14.64	-	

FIELD FORM

WATER TABLE/LNAPL THICKNESS MEASUREMENTS
BNSF WISHRAM

Monitoring Personnel:					
Well	Date / Time	Depth to LNAPL (feet btoc)	Depth to Water (feet btoc)	LNAPL Thickness (feet)	Well Status
WMW-21	1115		13.84		
WMW-23	1105		13.85		
WMW-22	1112		14.04		
WMW-24	1317		10.91		
WMW-26	1223		11.14		
WMW-27	1228		9.88		
WMW-28	1321		9.93		
WMW-29	1221		11.10		
WMW-30	1218		10.55		
WMW-31	1325	—	10.67	—	
WMW-32	1321	—	11.30	—	
Additional Notes:					

Groundwater Purge and Sample Form (Minimal Drawdown)

Kennedy/Jenks Consultants

Date: 11/7/18
 Project Name: BNSF Wishram
 Project Number: 1896120*00
 Sampling Personnel: KET
 Water Level Meter: Solinst or Geotech OWI
 Purging Equipment: Peristaltic Pump, Tubing
 Sampling Equipment: Peristaltic Pump, Tubing
 Sampling Time: 0920
 Total Discharge (gal): _____
 Water Disposal: On-Site 55-gallon drums
 Weather: Sunny

Well Number: WMW-14
 Monument Type: Stickup (ft PVC) Flush: X
 Well Diameter (in): 2
 Well Condition: good
 Total Casing Depth (ft): 30.0
 Screened Interval (ft): 12-27
 Purge Depth (ft): 20.0 19
 Depth to Groundwater (ft): 15.13
 Depth to LNAPL (ft): _____
 Water Column (ft): _____

TOC

Water Quality Meter(s)	Model	Calibration Date/Time	QA/QC Samples		
Temp/pH/SC/ORP/DO:	YSI 556	<u>11/5/18</u>	Type	Sample ID	Time
Turbidity:	Micro TPI				
Other:					

Sample ID	Sample Containers				Field Filtered	Analyses Requested (X)	MS/MSD & Comments
	No.	Type	Pres.	Vol.			
	2	VOA	HCl	40 mL	No	BTEX (8260)	
	2	VOA	HCl	40 mL	No	NWTPH-Gx	
	2	VOA	HCl	40 mL	No	NWTPH-Dx NO SGC	X
	2	VOA	HCl	40 mL	No	NWTPH-Dx WITH SGC	
	2	VOA	--	40 mL	No	PAHs (8270 SIM)	
	2	VOA	HCl	40 mL	No	Methane (RSK 175)	X
	1	HDPE	H2SO4	250 mL	No	Nitrate-Nitrite (353.2) & Ammonia (350.1/350.3)	X
	1	HDPE	none	125 mL	No	Sulfate (300.0)	X
	1	HDPE	NaOH/ZnAc	125 mL	No	Sulfide (376.2)	X
	1	HDPE	HNO3	250 mL	No	Tot. Metals (As) (6020)	
	1	HDPE	HNO3	250 mL	Yes	Diss. Metals (Mn, Fe)	X

Total Containers 8

Time	0835	0840	0845	0850	0855	0900	0905	0910	0915
Parameter (every 5 min)		5 min	10 min	15 min	20 min	25 min	30 min	35 min	40 min
Flow Rate (L/min)		0.1							
Volume Purged (Liters)		0.5	1.0	1.5	2.0	2.5	3.0	3.5	4.0
Water Depth (ft)		15.16	15.16	15.16	15.16	15.16	15.16	15.16	15.16
Temperature (°C), (± 0.2)		15.80	15.83	15.75	15.89	15.97	16.17	15.92	16.21
pH, (± 0.1)		7.59	7.60	7.62	7.80	7.84	7.95	7.91	8.01
Sp. Conductance (µS/cm), (± 3%)		0.224	0.224	0.226	0.226	0.226	0.226	0.226	0.226
DO (mg/L), (± 10% or 10% of 0.2mg/l)		1.66	1.33	1.22	1.03	0.95	0.87	0.87	0.83
ORP (mV), (± 10%)		80.4	72.3	67.8	55.9	52.2	45.8	47.4	40.0
Turbidity (NTU), (± 10% or 3 < 10 NTUs)		5.57	5.23	3.75	3.00	2.71	2.42	2.34	1.96
Color		clear							
Odor/Evidence of LNAPL		noo/s							

Notes: (i.e. actions taken if well dewatered, difficulties in sampling through LNAPL, problems during purging/sampling, etc.)

1 US Gallon = 3.8 Liters.

Groundwater Purge and Sample Form (Minimal Drawdown)

Kennedy/Jenks Consultants

Date: 11/7/18
 Project Name: BNSF Wishram
 Project Number: 1896120*00
 Sampling Personnel: KET
 Water Level Meter: Solinst or Geotech OWI
 Purging Equipment: Peristaltic Pump, Tubing
 Sampling Equipment: Peristaltic Pump, Tubing
 Sampling Time: 1050
 Total Discharge (gal): _____
 Water Disposal: On-Site 55-gallon drums
 Weather: Sunny

Well Number: WMW-15
 Monument Type: Stickup: _____ (ft PVC) Flush:
 Well Diameter (in): 2
 Well Condition: good
 Total Casing Depth (ft): 30.0
 Screened Interval (ft): 12-27
 Purge Depth (ft): 20.0 19
 Depth to Groundwater (ft): 14.94
 Depth to LNAPL (ft): _____
 Water Column (ft): _____

TOC

Water Quality Meter(s)	Model	Calibration Date/Time	QA/QC Samples		
Temp/pH/SC/ORP/DO:	YSI 556	<u>11/5/18</u>	Type	Sample ID	Time
Turbidity:	Micro TPI				
Other:					

Sample ID	Sample Containers				Field Filtered	Analyses Requested (X)	MS/MSD & Comments
	No.	Type	Pres.	Vol.			
	2	VOA	HCl	40 mL	No	BTEX (8260)	
	2	VOA	HCl	40 mL	No	NWTPH-Gx	
	2	VOA	HCl	40 mL	No	NWTPH-Dx NO SGC	X
	2	VOA	HCl	40 mL	No	NWTPH-Dx WITH SGC	
	2	VOA	--	40 mL	No	PAHs (8270 SIM)	
	2	VOA	HCl	40 mL	No	Methane (RSK 175)	X
	1	HDPE	H2SO4	250 mL	No	Nitrate-Nitrite (353.2) & Ammonia (350.1/350.3)	X
	1	HDPE	none	125 mL	No	Sulfate (300.0)	X
	1	HDPE	NaOH/ZnAc	125 mL	No	Sulfide (376.2)	X
	1	HDPE	HNO3	250 mL	No	Tot. Metals (As) (6020)	
	1	HDPE	HNO3	250 mL	Yes	Diss. Metals (Mn, Fe)	X

Total Containers 8

Time	1010	1015	1020	1025	1030	1035	1040	1045
<u>1005</u>								
Parameter (every 5 min)	5 min	10 min	15 min	20 min	25 min	30 min	35 min	40 min
Flow Rate (L/min)	<u>0.1</u>							
Volume Purged (Liters)	<u>0.5</u>	<u>1.0</u>	<u>1.5</u>	<u>2.0</u>	<u>2.5</u>	<u>3.0</u>	<u>3.5</u>	<u>4.0</u>
Water Depth (ft)	<u>15.00</u>	<u>15.00</u>	<u>15.01</u>	<u>15.01</u>	<u>15.01</u>	<u>15.01</u>	<u>15.01</u>	<u>15.01</u>
Temperature (°C), (± 0.2)	<u>17.08</u>	<u>17.03</u>	<u>17.21</u>	<u>17.26</u>	<u>17.41</u>	<u>17.29</u>	<u>17.46</u>	<u>17.37</u>
pH, (± 0.1)	<u>7.03</u>	<u>6.99</u>	<u>7.00</u>	<u>7.03</u>	<u>7.15</u>	<u>7.18</u>	<u>7.25</u>	<u>7.29</u>
Sp. Conductance (µS/cm), (± 3%)	<u>0.588</u>	<u>0.590</u>	<u>0.593</u>	<u>0.594</u>	<u>0.595</u>	<u>0.599</u>	<u>0.601</u>	<u>0.604</u>
DO (mg/L), (± 10% or 10% of 0.2mg/l)	<u>0.85</u>	<u>0.62</u>	<u>0.49</u>	<u>0.44</u>	<u>0.41</u>	<u>0.40</u>	<u>0.37</u>	<u>0.35</u>
ORP (mV), (± 10%)	<u>104.6</u>	<u>93.2</u>	<u>82.2</u>	<u>71.9</u>	<u>62.6</u>	<u>57.4</u>	<u>51.0</u>	<u>47.8</u>
Turbidity (NTU), (± 10% or 3 < 10 NTUs)	<u>3.38</u>	<u>2.87</u>	<u>6.73</u>	<u>4.16</u>	<u>5.94</u>	<u>4.71</u>	<u>3.13</u>	<u>3.93</u>
Color	<u>clear</u>							
Odor/Evidence of LNAPL	<u>no o/s</u>							

Notes: (i.e. actions taken if well dewatered, difficulties in sampling through LNAPL, problems during purging/sampling, etc.)

1 US Gallon = 3.8 Liters.

Groundwater Purge and Sample Form (Minimal Drawdown)

Kennedy/Jenks Consultants

Date: 11/7/18
 Project Name: BNSF Wishram
 Project Number: 1896120*00
 Sampling Personnel: KBT
 Water Level Meter: Solinst or Geotech OWI
 Purging Equipment: Peristaltic Pump, Tubing
 Sampling Equipment: Peristaltic Pump, Tubing
 Sampling Time: 1200
 Total Discharge (gal): _____
 Water Disposal: On-Site 55-gallon drums
 Weather: Sunny

Well Number: WMW-16
 Monument Type: Stickup (ft PVC) Flush: X
 Well Diameter (in): 2
 Well Condition: good
 Total Casing Depth (ft): 30.0
 Screened Interval (ft): 11.33-26.33
 Purge Depth (ft): 20.0 19
 Depth to Groundwater (ft): 14.71
 Depth to LNAPL (ft): _____
 Water Column (ft): _____

TOC

Water Quality Meter(s)	Model	Calibration Date/Time	QA/QC Samples		
Temp/pH/SC/ORP/DO:	YSI 556	<u>11/5/18</u>	Type	Sample ID	Time
Turbidity:	Micro TPI				
Other:					

Sample ID	Sample Containers				Field Filtered	Analyses Requested (X)	MS/MSD & Comments
	No.	Type	Pres.	Vol.			
	2	VOA	HCl	40 mL	No	BTEX (8260)	
	2	VOA	HCl	40 mL	No	NWTPH-Gx	X
	2	VOA	HCl	40 mL	No	NWTPH-Dx NO SGC	X
	2	VOA	HCl	40 mL	No	NWTPH-Dx WITH SGC	
	2	VOA	--	40 mL	No	PAHs (8270 SIM)	X
	2	VOA	HCl	40 mL	No	Methane (RSK 175)	X
	1	HDPE	H2SO4	250 mL	No	Nitrate-Nitrite (353.2) & Ammonia (350.1/350.3)	X
	1	HDPE	none	125 mL	No	Sulfate (300.0)	X
	1	HDPE	NaOH/ZnAc	125 mL	No	Sulfide (376.2)	X
	1	HDPE	HNO3	250 mL	No	Tot. Metals (As) (6020)	
	1	HDPE	HNO3	250 mL	Yes	Diss. Metals (Mn, Fe)	X

Total Containers 12

Time	1120	1125	1130	1135	1140	1145	1150	1155
Parameter (every 5 min)	5 min	10 min	15 min	20 min	25 min	30 min	35 min	40 min
Flow Rate (L/min)	<u>0.1</u>							
Volume Purged (Liters)	<u>0.5</u>	<u>1.0</u>	<u>1.5</u>	<u>2.0</u>	<u>2.5</u>	<u>3.0</u>	<u>3.5</u>	<u>4.0</u>
Water Depth (ft)	<u>14.74</u>	<u>14.74</u>	<u>14.74</u>	<u>14.75</u>	<u>14.70</u>	<u>14.75</u>	<u>14.70</u>	<u>14.70</u>
Temperature (°C), (± 0.2)	<u>18.07</u>	<u>18.37</u>	<u>18.51</u>	<u>18.57</u>	<u>18.59</u>	<u>18.55</u>	<u>18.48</u>	<u>18.65</u>
pH, (± 0.1)	<u>6.62</u>	<u>6.52</u>	<u>6.58</u>	<u>6.63</u>	<u>6.74</u>	<u>6.70</u>	<u>6.79</u>	<u>6.81</u>
Sp. Conductance (µS/cm), (± 3%)	<u>0.303</u>	<u>0.305</u>	<u>0.311</u>	<u>0.323</u>	<u>0.331</u>	<u>0.340</u>	<u>0.346</u>	<u>0.348</u>
DO (mg/L), (± 10% or 10% of 0.2mg/l)	<u>0.55</u>	<u>0.42</u>	<u>0.36</u>	<u>0.33</u>	<u>0.33</u>	<u>0.33</u>	<u>0.33</u>	<u>0.32</u>
ORP (mV), (± 10%)	<u>114.3</u>	<u>97.3</u>	<u>79.7</u>	<u>65.1</u>	<u>54.7</u>	<u>48.7</u>	<u>43.3</u>	<u>36.4</u>
Turbidity (NTU), (± 10% or 3 <10 NTUs)	<u>1.56</u>	<u>1.78</u>	<u>2.17</u>	<u>2.27</u>	<u>1.39</u>	<u>1.69</u>	<u>1.90</u>	<u>1.87</u>
Color	<u>clear</u>							
Odor/Evidence of LNAPL	<u>wo/s</u>							

Notes: (i.e. actions taken if well dewateres, difficulties in sampling through LNAPL, problems during purging/sampling, etc.)

1 US Gallon = 3.8 Liters.

Groundwater Purge and Sample Form (Minimal Drawdown)

Kennedy/Jenks Consultants

Date: 11/7/18 Well Number: WMW-17
 Project Name: BNSF Wishram Monument Type: Stickup (ft PVC) Flush: X
 Project Number: 1896120*00 Well Diameter (in): 2
 Sampling Personnel: BERRY ROCHA Well Condition: Good
 Water Level Meter: Solinst or Geotech OWI Total Casing Depth (ft): 30.0
 Purging Equipment: Peristaltic Pump, Tubing Screened Interval (ft): 12-27
 Sampling Equipment: Peristaltic Pump, Tubing Purge Depth (ft): ~~28.0~~ 19.0
 Sampling Time: 1000 Depth to Groundwater (ft): 14.50
 Total Discharge (gal): _____ Depth to LNAPL (ft): _____
 Water Disposal: On-Site 55-gallon drums Water Column (ft): _____

Weather: _____

Water Quality Meter(s)	Model	Calibration Date/Time	QA/QC Samples		
Temp/pH/SC/ORP/DO:	YSI 556		Type	Sample ID	Time
Turbidity:	Micro TPI		Duplicate	D-20181107	10:30
Other:			Dup on 15 or 16 if sheen in 17		

Sample ID	Sample Containers				Field Filtered	Analyses Requested (X)	MS/MSD & Comments
	No.	Type	Pres.	Vol.			
	2	VOA	HCl	40 mL	No	BTEX (8260)	
	2	VOA	HCl	40 mL	No	NWTPH-Gx	X
	2	VOA	HCl	40 mL	No	NWTPH-Dx NO SGC	X
	2	VOA	HCl	40 mL	No	NWTPH-Dx WITH SGC	
	2	VOA	--	40 mL	No	PAHs (8270 SIM)	
	2	VOA	HCl	40 mL	No	Methane (RSK 175)	X
	1	HDPE	H2SO4	250 mL	No	Nitrate-Nitrite (353.2) & Ammonia (350.1/350.3)	X
	1	HDPE	none	125 mL	No	Sulfate (300.0)	X
	1	HDPE	NaOH/ZnAc	125 mL	No	Sulfide (376.2)	X
	1	HDPE	HNO3	250 mL	No	Tot. Metals (As) (6020)	X
	1	HDPE	HNO3	250 mL	Yes	Diss.Metals (Mn,Fe, As)	X

Total Containers **11**

0915	Time	0920	0925	0930	0935	0940	0945	0950	0955
Parameter (every 5 min)		5 min	10 min	15 min	20 min	25 min	30 min	35 min	40 min
Flow Rate (L/min)		0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Volume Purged (Liters)		0.5	1.0	1.5	2.0	2.5	3.0	3.5	4.0
Water Depth (ft)		14.60	14.60	14.60	14.60	14.60	14.60	14.60	14.60
Temperature (°C), (± 0.2)		16.57	16.63	16.85	16.79	16.91	17.10	16.91	16.88
pH, (± 0.1)		6.98	6.85	6.84	6.83	6.83	6.83	6.82	6.82
Sp. Conductance (uS/cm), (± 3%)		0.383	0.376	0.356	0.355	0.355	0.358	0.357	0.356
DO (mg/L), (± 10% or 10% of 0.2mg/l)		1.26	0.58	0.40	0.30	0.31	0.27	0.26	0.25
ORP (mV), (± 10%)		158.12	88.1	-57.9	-112.3	-120.7	-137.1	-142.8	-145.1
Turbidity (NTU), (± 10% or 3 < 10 NTUs)		3.20	4.32	3.65	3.78	3.95	3.07	2.82	2.33
Color		CLEAR	CLEAR	CLEAR	-	-	-	-	-
Odor/Evidence of LNAPL		NONE	-	-	-	-	-	-	-

Notes: (i.e. actions taken if well dewatered, difficulties in sampling through LNAPL, problems during purging/sampling, etc.)

1 US Gallon = 3.8 Liters.

Groundwater Purge and Sample Form (Minimal Drawdown)

Kennedy/Jenks Consultants

Date: 11/7/18
 Project Name: BNSF Wishram
 Project Number: 1896120*00
 Sampling Personnel: BERRY BOUMA
 Water Level Meter: Solinst or Geotech OWI
 Purging Equipment: Peristaltic Pump, Tubing
 Sampling Equipment: Peristaltic Pump, Tubing
 Sampling Time: 0820
 Total Discharge (gal): 1
 Water Disposal: On-Site 55-gallon drums

Well Number: WMW-18
 Monument Type: Stickup: (ft PVC) Flush: X
 Well Diameter (in): 2
 Well Condition: GOOD
 Total Casing Depth (ft): 30.0
 Screened Interval (ft): 12-27
 Purge Depth (ft): 20.0 19.0
 Depth to Groundwater (ft): 14.81
 Depth to LNAPL (ft): _____
 Water Column (ft): _____

TOC

Weather: Sunny 1 0-5 MPH WIND

Water Quality Meter(s)	Model	Calibration Date/Time	QA/QC Samples		
Temp/pH/SC/ORP/DO:	YSI 556		Type	Sample ID	Time
Turbidity:	Micro TPI				
Other:					

Sample ID	Sample Containers				Field Filtered	Analyses Requested (X)	MS/MSD & Comments
	No.	Type	Pres.	Vol.			
	2	VOA	HCl	40 mL	No	BTEX (8260)	
	2	VOA	HCl	40 mL	No	NWTPH-Gx	
	2	VOA	HCl	40 mL	No	NWTPH-Dx NO SGC	<input checked="" type="checkbox"/>
	2	VOA	HCl	40 mL	No	NWTPH-Dx WITH SGC	
	2	VOA	--	40 mL	No	PAHs (8270 SIM)	
	2	VOA	HCl	40 mL	No	Methane (RSK 175)	<input checked="" type="checkbox"/>
	1	HDPE	H2SO4	250 mL	No	Nitrate-Nitrite (353.2) & Ammonia (350.1/350.3)	<input checked="" type="checkbox"/>
	1	HDPE	none	125 mL	No	Sulfate (300.0)	<input checked="" type="checkbox"/>
	1	HDPE	NaOH/ZnAc	125 mL	No	Sulfide (376.2)	<input checked="" type="checkbox"/>
	1	HDPE	HNO3	250 mL	No	Tot. Metals (As) (6020)	<input checked="" type="checkbox"/>
	1	HDPE	HNO3	250 mL	Yes	Diss.Metals (Mn,Fe, As)	<input checked="" type="checkbox"/>

Total Containers 9

	Time	0745	0750	0755	0800	0805	0810	0815	
Parameter (every 5 min)	5 min	10 min	15 min	20 min	25 min	30 min	35 min		min
Flow Rate (L/min)		0.1	0.1	0.1	0.1	0.1	0.1	0.1	
Volume Purged (Liters)		0.5	1.0	1.5	2.0	2.5	3.0	3.5	
Water Depth (ft)		14.91	14.79	14.79	14.79	14.79	14.76	14.76	
Temperature (°C), (± 0.2)		16.00	16.01	15.98	16.00	16.09	16.11	16.36	
pH, (± 0.1)		7.62	7.25	7.03	7.03	6.99	6.97	6.96	
Sp. Conductance (µS/cm), (± 3%)		0.325	0.325	0.324	0.324	0.325	0.325	0.325	
DO (mg/L), (± 10% or 10% of 0.2mg/l)		2.27	1.30	0.84	0.69	0.56	0.46	0.44	
ORP (mV), (± 10%)		187.6	193.7	191.4	188.4	184.1	177.3	168.6	
Turbidity (NTU), (± 10% or 3 < 10 NTUs)		3.14	2.63	1.68	2.03	1.60	1.68	1.75	
Color		CLEAR							
Odor/Evidence of LNAPL		NONE							

Notes: (i.e. actions taken if well dewatered, difficulties in sampling through LNAPL, problems during purging/sampling, etc.)

1 US Gallon = 3.8 Liters.

Groundwater Purge and Sample Form (Minimal Drawdown)

Kennedy/Jenks Consultants

Date: 11/7/19 Well Number: WMW-19
 Project Name: BNSF Wishram Monument Type: Stickup (ft PVC) Flush: X
 Project Number: 1896120*05 Well Diameter (in): 2-inch PVC
 Sampling Personnel: Benny Bortia VET Well Condition: Good
 Water Level Meter: Solinst or Geotech OWI Total Casing Depth (ft): 21.5
 Purging Equipment: Peristaltic Pump, Tubing Screened Interval (ft): 11.5-21.5
 Sampling Equipment: Peristaltic Pump, Tubing Purge Depth (ft): 19.0
 Sampling Time: 0805 Depth to Groundwater (ft): 15.03
 Total Discharge (gal): _____ Depth to LNAPL (ft): —
 Water Disposal: On-Site 55-gallon drums Water Column (ft): _____
 Weather: Sunny

TOC

Water Quality Meter(s)	Model	Calibration Date/Time	QA/QC Samples		
Temp/pH/SC/ORP/DO:	YSI 556		Type	Sample ID	Time
Turbidity:	Micro TPI				
Other:					

Sample ID	Sample Containers				Field Filtered	Analyses Requested (X)		MS/MSD & Comments
	No.	Type	Pres.	Vol.				
	<u>3</u>	VOA	HCl	40 mL	No	BTEX (8260)	X	
	3	VOA	HCl	40 mL	No	NWTPH-Gx		
	2	VOA	HCl	40 mL	No	NWTPH-Dx NO SGC	X	
	2	VOA	HCl	40 mL	No	NWTPH-Dx WITH SGC		
	2	VOA	--	40 mL	No	PAHs (8270 SIM)		
	2	VOA	HCl	40 mL	No	Methane (RSK 175)	X	
	1	HDPE	H2SO4	250 mL	No	Nitrate-Nitrite (353.2) & Ammonia (350.1/350.3)	X	
	1	HDPE	none	125 mL	No	Sulfate (300.0)	X	
	1	HDPE	NaOH/ZnAc	125 mL	No	Sulfide (376.2)	X	
	1	HDPE	HNO3	250 mL	No	Tot. Metals (Pb only) (6020)		
	1	HDPE	HNO3	250 mL	Yes	Diss. Metals (Mn, Fe)	X	

Total Containers 10

	Time	0735	0740	0745	0750	0755	0800		
<u>0730</u>									
Parameter (every 5 min)		5 min	10 min	15 min	20 min	25 min	30 min	min	min
Flow Rate (L/min)		<u>0.1</u>							
Volume Purged (Liters)		<u>0.5</u>	<u>1.0</u>	<u>1.5</u>	<u>2.0</u>	<u>2.5</u>	<u>3.0</u>		
Water Depth (ft)		<u>15.16</u>	<u>15.17</u>	<u>15.16</u>	<u>15.17</u>	<u>15.17</u>	<u>15.17</u>		
Temperature (°C), (± 0.2)		<u>15.50</u>	<u>15.61</u>	<u>15.66</u>	<u>16.02</u>	<u>16.02</u>	<u>15.99</u>		
pH, (± 0.1)		<u>8.49</u>	<u>8.24</u>	<u>8.11</u>	<u>8.00</u>	<u>8.97</u>	<u>7.80</u>		
Sp. Conductance (µS/cm), (± 3%)		<u>0.254</u>	<u>0.253</u>	<u>0.252</u>	<u>0.251</u>	<u>0.251</u>	<u>0.248</u>		
DO (mg/L), (± 10% or 10% of 0.2mg/l)		<u>0.91</u>	<u>0.63</u>	<u>0.55</u>	<u>0.47</u>	<u>0.46</u>	<u>0.44</u>		
ORP (mV), (± 10%)		<u>89.2</u>	<u>85.5</u>	<u>83.6</u>	<u>84.6</u>	<u>82.1</u>	<u>82.0</u>		
Turbidity (NTU), (± 10% or 3 < 10 NTUs)		<u>16.67</u>	<u>12.81</u>	<u>11.05</u>	<u>7.38</u>	<u>4.87</u>	<u>4.35</u>		
Color		<u>clear</u>							
Odor/Evidence of LNAPL		<u>no o/s</u>							

Notes: (i.e. actions taken if well dewateres, difficulties in sampling through LNAPL, problems during purging/sampling, etc.)

1 US Gallon = 3.8 Liters.

Special note re: analyses: BTEX, Lead + MNA for metals

Groundwater Purge and Sample Form (Minimal Drawdown)

Kennedy/Jenks Consultants

Date: 11/6/18
 Project Name: BNSF Wishram
 Project Number: 1896120*05
 Sampling Personnel: BENNY ROCHA
 Water Level Meter: Solinst or Geotech OWI
 Purging Equipment: Peristaltic Pump, Tubing
 Sampling Equipment: Peristaltic Pump, Tubing
 Sampling Time: 1650
 Total Discharge (gal): _____
 Water Disposal: On-Site 55-gallon drums

Well Number: WMW-20
 Monument Type: Stickup: _____ (ft PVC) Flush: X
 Well Diameter (in): 2-inch PVC
 Well Condition: _____
 Total Casing Depth (ft): 21.5
 Screened Interval (ft): 11.5-21.5
 Purge Depth (ft): 19.0
 Depth to Groundwater (ft): 14.74
 Depth to LNAPL (ft): -
 Water Column (ft): _____

TOC

Weather: _____

Water Quality Meter(s)	Model	Calibration Date/Time	QA/QC Samples		
Temp/pH/SC/ORP/DO:	YSI 556		Type	Sample ID	Time
Turbidity:	Micro TPI				
Other:					

Sample ID	Sample Containers				Field Filtered	Analyses Requested (X)	MS/MSD & Comments
	No.	Type	Pres.	Vol.			
	2	VOA	HCl	40 mL	No	BTEX (8260)	X
	2	VOA	HCl	40 mL	No	NWTPH-Gx	
	2	VOA	HCl	40 mL	No	NWTPH-Dx NO SGC	X
	2	VOA	HCl	40 mL	No	NWTPH-Dx WITH SGC	
	2	VOA	--	40 mL	No	PAHs (8270 SIM)	
	2	VOA	HCl	40 mL	No	Methane (RSK 175)	X
	1	HDPE	H2SO4	250 mL	No	Nitrate-Nitrite (353.2) & Ammonia (350.1/350.3)	X
	1	HDPE	none	125 mL	No	Sulfate (300.0)	X
	1	HDPE	NaOH/ZnAc	125 mL	No	Sulfide (376.2)	X
	1	HDPE	HNO3	250 mL	No	Tot. Metals (RCRA8) (6020)	
	1	HDPE	HNO3	250 mL	Yes	Diss.Metals (Mn,Fe)	X

Total Containers 10

Time	1610	1615	1620	1625	1630	1635	1640	1645
Parameter (every 5 min)	5 min	10 min	15 min	20 min	25 min	30 min	35 min	40 min
Flow Rate (L/min)	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Volume Purged (Liters)	0.5	1.0	1.5	2.0	2.5	3.0	3.5	4.0
Water Depth (ft)	15.07	15.09	15.09	15.11	15.09	15.12	15.13	15.13
Temperature (°C), (± 0.2)	16.68	16.72	16.71	16.72	16.59	16.65	16.60	16.65
pH, (± 0.1)	7.42	7.31	7.24	7.18	7.14	7.11	7.09	7.07
Sp. Conductance (uS/cm), (± 3%)	0.346	0.355	0.377	0.392	0.405	0.412	0.420	0.430
DO (mg/L), (± 10% or 10% of 0.2mg/l)	1.26	0.69	0.52	0.44	0.42	0.59	0.36	0.35
ORP (mV), (± 10%)	135.2	103.7	65.7	35.5	160	20	-141	-28.1
Turbidity (NTU), (± 10% or 3 < 10 NTUs)	7449	33.33	19.13	9.78	8.34	8.55	6.01	4.88
Color	Brownish	very light brown	clear	clear	-	-	-	-
Odor/Evidence of LNAPL	NA	-	-	-	-	-	-	-

Notes: (i.e. actions taken if well dewatered, difficulties in sampling through LNAPL, problems during purging/sampling, etc.)

1 US Gallon = 3.8 Liters.

Special note re: analyses: BTEX, RCRA8 + MNA for metals

Groundwater Purge and Sample Form (Minimal Drawdown)

Kennedy/Jenks Consultants

Date: 11/6/18
 Project Name: BNSF Wishram
 Project Number: 1896120*05
 Sampling Personnel: BERNI ROCHA
 Water Level Meter: Solinst or Geotech OWI
 Purging Equipment: Peristaltic Pump, Tubing
 Sampling Equipment: Peristaltic Pump, Tubing
 Sampling Time: 1520
 Total Discharge (gal): _____
 Water Disposal: On-Site 55-gallon drums

Well Number: WMW-21
 Monument Type: Stickup: _____ (ft PVC) Flush: X
 Well Diameter (in): 2-inch PVC
 Well Condition: _____
 Total Casing Depth (ft): 21.5
 Screened Interval (ft): 11.5-21.5
 Purge Depth (ft): 19.0
 Depth to Groundwater (ft): 13.90
 Depth to LNAPL (ft): _____
 Water Column (ft): _____

TOC

Weather: _____

Water Quality Meter(s)	Model	Calibration Date/Time	QA/QC Samples		
Temp/pH/SC/ORP/DO:	YSI 556		Type	Sample ID	Time
Turbidity:	Micro TPI				
Other:					

Sample ID	Sample Containers				Field Filtered	Analyses Requested (X)		MS/MSD & Comments
	No.	Type	Pres.	Vol.				
	2	VOA	HCl	40 mL	No	BTEX (8260)	X	
	2	VOA	HCl	40 mL	No	NWTPH-Gx		
	2	VOA	HCl	40 mL	No	NWTPH-Dx NO SGC	X	
	2	VOA	HCl	40 mL	No	NWTPH-Dx WITH SGC	X	
	2	VOA	--	40 mL	No	PAHs (8270 SIM)		
	2	VOA	HCl	40 mL	No	Methane (RSK 175)	X	
	1	HDPE	H2SO4	250 mL	No	Nitrate-Nitrite (353.2) & Ammonia (350.1/350.3)	X	
	1	HDPE	none	125 mL	No	Sulfate (300.0)	X	
	1	HDPE	NaOH/ZnAc	125 mL	No	Sulfide (376.2)	X	
	1	HDPE	HNO3	250 mL	No	Tot. Metals (RCRA8) (6020)		
	1	HDPE	HNO3	250 mL	Yes	Diss.Metals (Mn,Fe)	X	

Total Containers 12

	Time	1455	1500	1505	1510	1515			
Parameter (every 5 min)	5 min	10 min	15 min	20 min	25 min		min	min	min
Flow Rate (L/min)	0.1	0.1	0.1	0.1	0.1				
Volume Purged (Liters)	0.5	1.0	1.5	2.0	2.5				
Water Depth (ft)	14.08	14.08	14.08	14.08	14.08				
Temperature (°C), (± 0.2)	16.74	16.69	16.68	16.63	16.64				
pH, (± 0.1)	7.31	7.30	7.29	7.28	7.28				
Sp. Conductance (uS/cm), (± 3%)	0.609	0.608	0.605	0.603	0.602				
DO (mg/L), (± 10% or 10% of 0.2mg/l)	0.43	0.37	0.31	0.34	0.35				
ORP (mV), (± 10%)	127.8	126.5	120.5	116.3	112.7				
Turbidity (NTU), (± 10% or 3 < 10 NTUs)	5.14	4.67	3.64	4.25	2.99				
Color	CLEAR	-	-	-	-				
Odor/Evidence of LNAPL	NA	-	-	-	-				

Notes: (i.e. actions taken if well dewater, difficulties in sampling through LNAPL, problems during purging/sampling, etc.)

1 US Gallon = 3.8 Liters.

Special note re: analyses: BTEX, NWTPH-Dx with AND without SGC, RCRA8 + MNA for metals

Groundwater Purge and Sample Form (Minimal Drawdown)

Kennedy/Jenks Consultants

Date: 11/6/16
 Project Name: BNSF Wishram
 Project Number: 1896120*05
 Sampling Personnel: BENNY POOMA
 Water Level Meter: Solinst or Geotech OWI
 Purging Equipment: Peristaltic Pump, Tubing
 Sampling Equipment: Peristaltic Pump, Tubing
 Sampling Time: 1350
 Total Discharge (gal): _____
 Water Disposal: On-Site 55-gallon drums

Well Number: WMW-22
 Monument Type: Stickup: _____ (ft PVC) Flush:
 Well Diameter (in): 2-inch PVC
 Well Condition: Good
 Total Casing Depth (ft): 21.5
 Screened Interval (ft): 11.5-21.5
 Purge Depth (ft): 19.0
 Depth to Groundwater (ft): 14.20
 Depth to LNAPL (ft): _____
 Water Column (ft): 7.3

TOC

Weather: _____

Water Quality Meter(s)	Model	Calibration Date/Time	QA/QC Samples		
Temp/pH/SC/ORP/DO:	YSI 556		Type	Sample ID	Time
Turbidity:	Micro TPI				
Other:					

Sample ID	Sample Containers				Field Filtered	Analyses Requested (X)		MS/MSD & Comments
	No.	Type	Pres.	Vol.				
	2	VOA	HCl	40 mL	No	BTEX (8260)	X	
	2	VOA	HCl	40 mL	No	NWTPH-Gx		
	2	VOA	HCl	40 mL	No	NWTPH-Dx NO SGC	X	
	2	VOA	HCl	40 mL	No	NWTPH-Dx WITH SGC	X	
	2	VOA	--	40 mL	No	PAHs (8270 SIM)		
	2	VOA	HCl	40 mL	No	Methane (RSK 175)	X	
	1	HDPE	H2SO4	250 mL	No	Nitrate-Nitrite (353.2) & Ammonia (350.1/350.3)	X	
	1	HDPE	none	125 mL	No	Sulfate (300.0)	X	
	1	HDPE	NaOH/ZnAc	125 mL	No	Sulfide (376.2)	X	
	1	HDPE	HNO3	250 mL	No	Tot. Metals (RCRA8) (6020)		
	1	HDPE	HNO3	250 mL	Yes	Diss. Metals Mn, Fe)	X	

Total Containers 12

	1300	Time	1305	1310	1315	1320	1325	1330	1335	1340
Parameter (every 5 min)	5 min		10 min	15 min	20 min	25 min	30 min	35 min	40 min	
Flow Rate (L/min)	0.1		0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Volume Purged (Liters)	0.5		1.0	1.5	2.0	2.5	3.0	3.5	4.0	
Water Depth (ft)	14.20		14.20	14.20	14.20	14.20	14.20	14.20	14.20	14.20
Temperature (°C), (± 0.2)	12.62		17.79	17.80	16.02	18.10	18.24	17.95	18.19	
pH, (± 0.1)	7.55		7.93	7.27	7.22	7.19	7.16	7.11	7.17	
Sp. Conductance (uS/cm), (± 3%)	0.442		0.465	0.456	0.437	0.430	0.426	0.512	0.419	
DO (mg/L), (± 10% or 10% of 0.2mg/l)	2.52		2.30	2.42	1.95	1.86	1.89	0.38	1.99	
ORP (mV), (± 10%)	107.7		114.6	117.3	113.3	109.4	105.5	100.9	97.1	
Turbidity (NTU), (± 10% or 3 < 10 NTUs)	44.43		53.66	42.56	12.97	6.67	3.34	10.14	4.28	
Color	CLEAR		C-	-	-	-	-	-	-	
Odor/Evidence of LNAPL	NA		-	-	-	-	-	-	-	

Notes: (i.e. actions taken if well dewater, difficulties in sampling through LNAPL, problems during purging/sampling, etc.)

1 US Gallon = 3.8 Liters.

Special note re: analyses: BTEX, NWTPH-Dx with AND without SGC, RCRA8 + MNA for metals

Groundwater Purge and Sample Form (Minimal Drawdown)

Kennedy/Jenks Consultants

Date: 11/6/18
 Project Name: BNSF Wishram
 Project Number: 1896120*05
 Sampling Personnel: BEAMY ROCHA
 Water Level Meter: Solinst or Geotech OWI
 Purging Equipment: Peristaltic Pump, Tubing
 Sampling Equipment: Peristaltic Pump, Tubing
 Sampling Time: 11:30
 Total Discharge (gal): _____
 Water Disposal: On-Site 55-gallon drums

Well Number: WMW-23
 Monument Type: Stickup: _____ (ft PVC) Flush:
 Well Diameter (in): 2-inch PVC
 Well Condition: _____
 Total Casing Depth (ft): 21.5
 Screened Interval (ft): 11.5-21.5
 Purge Depth (ft): 20.5
 Depth to Groundwater (ft): 13.92
 Depth to LNAPL (ft): —
 Water Column (ft): _____

TOC

Weather: SUNNY / 10-20 MPH WIND

Water Quality Meter(s)	Model	Calibration Date/Time	QA/QC Samples		
Temp/pH/SC/ORP/DO:	YSI 556		Type	Sample ID	Time
Turbidity:	Micro TPI				
Other:					

Sample ID	Sample Containers				Field Filtered	Analyses Requested (X)		MS/MSD & Comments
	No.	Type	Pres.	Vol.				
	2	VOA	HCl	40 mL	No	BTEX (8260) 3x40-HCl	X	
	2	VOA	HCl	40 mL	No	NWTPH-Gx		
	2	VOA	HCl	40 mL	No	NWTPH-Dx NO SGC 3x40-HCl	X	
	2	VOA	HCl	40 mL	No	NWTPH-Dx WITH SGC		
	2	VOA	--	40 mL	No	PAHs (8270 SIM)		
	2	VOA	HCl	40 mL	No	Methane (RSK 175) 2x40 HCl	X	
	1	HDPE	H2SO4	250 mL	No	Nitrate-Nitrite (353.2) & 250 Ammonia (350.1/350.3) H2SO4	X	
	1	HDPE	none	125 mL	No	Sulfate (300.0) 125 HDPE	X	
	1	HDPE	NaOH/ZnAc	125 mL	No	Sulfide (376.2) 125 NaOH-NaAc	X	
	1	HDPE	HNO3	250 mL	No	Tot. Metals (RCRA8) (6020)		
	1	HDPE	HNO3	250 mL	Yes	Diss. Metals (Mn, Fe) 250 F	X	

Total Containers 10

	1055	Time	1100	1105	1110	1115	1120			
Parameter (every 5 min)	5 min	10 min	15 min	20 min	25 min			min	min	min
Flow Rate (L/min)	0.1	0.1	0.1	0.1	0.1					
Volume Purged (Liters)	0.5	1.0	1.5	2.0	2.5					
Water Depth (ft)	10.5 13.29	13.90	13.92	13.93	13.93					
Temperature (°C), (± 0.2)	17.58	17.71	17.74	17.77	17.84					
pH, (± 0.1)	7.71	7.66	7.38	7.33	7.16					
Sp. Conductance (µS/cm), (± 3%)	0.483	0.453	0.418	0.407	0.406					
DO (mg/L), (± 10% or 10% of 0.2mg/l)	0.68	1.03	2.35	2.98	3.00					
ORP (mV), (± 10%)	52.4	48.5	51.6	51.9	51.0					
Turbidity (NTU), (± 10% or 3 < 10 NTUs)	16.83	10.77	10.68	6.83	5.51					
Color	CLEAR	CLEAR	-	-	-					
Odor/Evidence of LNAPL	NA	NA	NA	-	-					

Notes: (i.e. actions taken if well dewater, difficulties in sampling through LNAPL, problems during purging/sampling, etc.)

1 US Gallon = 3.8 Liters.

Special note re: analyses: BTEX, RCRA8 + MNA for metals

Groundwater Purge and Sample Form (Minimal Drawdown)

Kennedy/Jenks Consultants

Date: 11/6/18
 Project Name: BNSF Wishram
 Project Number: 1896120*05
 Sampling Personnel: KET
 Water Level Meter: Solinst or Geotech OWI
 Purging Equipment: Peristaltic Pump, Tubing
 Sampling Equipment: Peristaltic Pump, Tubing
 Sampling Time: 1055
 Total Discharge (gal): _____
 Water Disposal: On-Site 55-gallon drums

Well Number: WMW-24
 Monument Type: Stickup (ft PVC) Flush: X
 Well Diameter (in): 2-inch PVC
 Well Condition: good
 Total Casing Depth (ft): 17.0
 Screened Interval (ft): 7-17
 Purge Depth (ft): 14
 Depth to Groundwater (ft): 10.98
 Depth to LNAPL (ft): _____
 Water Column (ft): _____

TOC

Weather: Sunny, windy

Water Quality Meter(s)	Model	Calibration Date/Time	QA/QC Samples		
Temp/pH/SC/ORP/DO:	YSI 556	<u>11/5/18</u>	Type	Sample ID	Time
Turbidity:	Micro TPI				
Other:					

Sample ID	Sample Containers				Field Filtered	Analyses Requested (X)		MS/MSD & Comments
	No.	Type	Pres.	Vol.				
	2	VOA	HCl	40 mL	No	VOCs (8260)	X	
	2	VOA	HCl	40 mL	No	NWTPH-Gx		
	2	VOA	HCl	40 mL	No	NWTPH-Dx NO SGC	X	
	2	VOA	HCl	40 mL	No	NWTPH-Dx WITH SGC		
	2	VOA	--	40 mL	No	PAHs (8270 SIM)		
	2	VOA	HCl	40 mL	No	Methane (RSK 175)	X	
	1	HDPE	H2SO4	250 mL	No	Nitrate-Nitrite (353.2) & Ammonia (350.1/350.3)	X	
	1	HDPE	none	125 mL	No	Sulfate (300.0)	X	
	1	HDPE	NaOH/ZnAc	125 mL	No	Sulfide (376.2)	X	
	1	HDPE	HNO3	250 mL	No	Tot. Metals (RCRA8) (6020)		
	1	HDPE	HNO3	250 mL	Yes	Diss.Metals (Mn,Fe)	X	

Total Containers 10

Time	1015	1020	1025	1030	1035	1040	1045	1050
Parameter (every 5 min)	5 min	10 min	15 min	20 min	25 min	30 min	35 min	40 min
Flow Rate (L/min)	<u>0.1</u>							
Volume Purged (Liters)	<u>0.5</u>	<u>1.0</u>	<u>1.5</u>	<u>2.0</u>	<u>2.5</u>	<u>3.0</u>	<u>3.5</u>	<u>4.0</u>
Water Depth (ft)	<u>11.49</u>	<u>11.40</u>	<u>11.43</u>	<u>11.43</u>	<u>11.30</u>	<u>11.35</u>	<u>11.33</u>	<u>11.32</u>
Temperature (°C), (± 0.2)	<u>18.09</u>	<u>18.05</u>	<u>17.87</u>	<u>17.90</u>	<u>17.75</u>	<u>17.79</u>	<u>17.75</u>	<u>17.70</u>
pH, (± 0.1)	<u>8.04</u>	<u>8.03</u>	<u>7.92</u>	<u>7.95</u>	<u>7.99</u>	<u>7.96</u>	<u>7.91</u>	<u>7.94</u>
Sp. Conductance (µS/cm), (± 3%)	<u>0.629</u>	<u>0.578</u>	<u>0.594</u>	<u>0.557</u>	<u>0.570</u>	<u>0.578</u>	<u>0.581</u>	<u>0.579</u>
DO (mg/L), (± 10% or 10% of 0.2mg/l)	<u>0.84</u>	<u>0.80</u>	<u>0.70</u>	<u>0.68</u>	<u>0.70</u>	<u>0.62</u>	<u>0.53</u>	<u>0.55</u>
ORP (mV), (± 10%)	<u>71.3</u>	<u>68.5</u>	<u>70.2</u>	<u>66.9</u>	<u>65.9</u>	<u>65.5</u>	<u>64.5</u>	<u>61.6</u>
Turbidity (NTU), (± 10% or 3 < 10 NTUs)	<u>1.40</u>	<u>1.33</u>	<u>2.15</u>	<u>1.24</u>	<u>0.80</u>	<u>1.15</u>	<u>1.77</u>	<u>1.30</u>
Color	<u>clear</u>							
Odor/Evidence of LNAPL	<u>no/s</u>							

Notes: (i.e. actions taken if well dewatered, difficulties in sampling through LNAPL, problems during purging/sampling, etc.)

1 US Gallon = 3.8 Liters.

Special note re: analyses: Full VOCs list, RCRA8 + MNA for metals

Groundwater Purge and Sample Form (Minimal Drawdown)

Kennedy/Jenks Consultants

Date: 11/5/18 Well Number: **WMW-26**
 Project Name: **BNSF Wishram** Monument Type: Stickup (ft PVC) Flush: X
 Project Number: **1896120*05** Well Diameter (in): 2-inch PVC
 Sampling Personnel: _____ Well Condition: _____
 Water Level Meter: Solinst or Geotech OWI Total Casing Depth (ft): 17.0
 Purging Equipment: Peristaltic Pump, Tubing Screened Interval (ft): 7-17
 Sampling Equipment: Peristaltic Pump, Tubing Purge Depth (ft): 14
 Sampling Time: 11/6/18 0730 Depth to Groundwater (ft): 11.17
 Total Discharge (gal): _____ Depth to LNAPL (ft): —
 Water Disposal: On-Site 55-gallon drums Water Column (ft): _____

Weather: windy

Water Quality Meter(s)	Model	Calibration Date/Time	QA/QC Samples		
Temp/pH/SC/ORP/DO:	YSI 556		Type	Sample ID	Time
Turbidity:	Micro TPI				--
Other:					

Sample ID	Sample Containers				Field Filtered	Analyses Requested (X)		MS/MSD & Comments
	No.	Type	Pres.	Vol.				
	3 2	VOA	HCl	40 mL	No	VOCs (8260)	X	
	2	VOA	HCl	40 mL	No	NWTPH-Gx	X	
	2	VOA	HCl	40 mL	No	NWTPH-Dx NO SGC	X	
	2	VOA	HCl	40 mL	No	NWTPH-Dx WITH SGC	X	
	2	VOA	--	40 mL	No	PAHs (8270 SIM)		
	2	VOA	HCl	40 mL	No	Methane (RSK 175)	X	
	1	HDPE	H2SO4	250 mL	No	Nitrate-Nitrite (353.2) & Ammonia (350.1/350.3)	X	
	1	HDPE	none	125 mL	No	Sulfate (300.0)	X	
	1	HDPE	NaOH/ZnAc	125 mL	No	Sulfide (376.2)	X	
	1	HDPE	HNO3	250 mL	No	Tot. Metals (RCRA8) (6020)		
	1	HDPE	HNO3	250 mL	Yes	Diss. Metals (Mn, Fe)	X	

Total Containers **12**

Time	1520	1525	1530	1535	1540	1545	1550	1555	074
Parameter (every 5 min)	5 min	10 min	15 min	20 min	25 min	30 min	35 min	40 min	
Flow Rate (L/min)	0.1								
Volume Purged (Liters)	0.5	1.0	1.5	2.0	2.5	3.0	3.5	4.0	
Water Depth (ft)	11.17	12.80	12.88	12.84	13.42	13.76	14.15	14.14	13.3
Temperature (°C), (± 0.2)	17.60	17.22	16.64	16.38	17.11	17.11	17.13	16.69	16.5
pH, (± 0.1)	7.15	7.10	7.02	7.06	7.20	7.22	7.25	7.06	7.6
Sp. Conductance (µS/cm), (± 3%)	0.772	0.604	0.627	0.620	0.628	0.628	0.627	0.622	0.6
DO (mg/L), (± 10% or 10% of 0.2mg/l)	1.02	1.78	3.03	3.51	0.83	0.63	0.76	1.57	5.2
ORP (mV), (± 10%)	154.0	139.9	139.0	135.9	115.7	100.1	81.4	79.0	19%
Turbidity (NTU), (± 10% or 3 < 10 NTUs)	2.37	6.21	16.19	17.71	14.69	18.97	4.28	19.28	2.9
Color	clear								
Odor/Evidence of LNAPL	no oil								

Notes: (i.e. actions taken if well dewater, difficulties in sampling through LNAPL, problems during purging/sampling, etc.)
 1 US Gallon = 3.8 Liters. 11/6/18 0710 well at 11.17' bptoc, start purging & sample.
 Special note re: analyses: Full VOCs list, NWTPH-Dx with AND without SGC, RCRA8 + MNA for metals
Purged at 14' after 20 min water was bubbling so let tubing down to ~14.5' & water flowed better 11:04 called RH, purged well by @11:05

Groundwater Purge and Sample Form (Minimal Drawdown)

Kennedy/Jenks Consultants

Date: 11/6/18
 Project Name: BNSF Wishram
 Project Number: 1896120*05
 Sampling Personnel: KET
 Water Level Meter: Solinst or Geotech OWI
 Purging Equipment: Peristaltic Pump, Tubing
 Sampling Equipment: Peristaltic Pump, Tubing
 Sampling Time: 1300
 Total Discharge (gal): _____
 Water Disposal: On-Site 55-gallon drums

Well Number: WMW-27
 Monument Type: Stickup: _____ (ft PVC) Flush: X
 Well Diameter (in): 2-inch PVC
 Well Condition: good
 Total Casing Depth (ft): 17.0
 Screened Interval (ft): 7-17
 Purge Depth (ft): 14
 Depth to Groundwater (ft): 9.91
 Depth to LNAPL (ft): —
 Water Column (ft): _____

Weather: SUNNY / WINDY

Water Quality Meter(s)	Model	Calibration Date/Time	QA/QC Samples		
Temp/pH/SC/ORP/DO:	YSI 556	<u>11/6/18</u>	Type	Sample ID	Time
Turbidity:	Micro TPI	<u>5</u>			
Other:					

Sample ID	Sample Containers				Field Filtered	Analyses Requested (X)		MS/MSD & Comments
	No.	Type	Pres.	Vol.				
	2	VOA	HCl	40 mL	No	VOCs (8260)	X	
	2	VOA	HCl	40 mL	No	NWTPH-Gx		
	2	VOA	HCl	40 mL	No	NWTPH-Dx NO SGC	X	
	2	VOA	HCl	40 mL	No	NWTPH-Dx WITH SGC		
	2	VOA	--	40 mL	No	PAHs (8270 SIM)		
	2	VOA	HCl	40 mL	No	Methane (RSK 175)	X	
	1	HDPE	H2SO4	250 mL	No	Nitrate-Nitrite (353.2) & Ammonia (350.1/350.3)	X	
	1	HDPE	none	125 mL	No	Sulfate (300.0)	X	
	1	HDPE	NaOH/ZnAc	125 mL	No	Sulfide (376.2)	X	
	1	HDPE	HNO3	250 mL	No	Tot. Metals (RCRA8) (6020)		
	1	HDPE	HNO3	250 mL	Yes	Diss.Metals (Mn,Fe)	X	

Total Containers 10

Parameter (every 5 min)	Time	1240	1245	1250	1255	1300			
		5 min	10 min	15 min	20 min	25 min	min	min	min
Flow Rate (L/min)		<u>0.1</u>							
Volume Purged (Liters)		<u>0.5</u>	<u>1.0</u>	<u>1.5</u>	<u>2.0</u>				
Water Depth (ft)		<u>10.44</u>	<u>10.50</u>	<u>10.55</u>	<u>10.50</u>				
Temperature (°C), (± 0.2)		<u>17.24</u>	<u>17.40</u>	<u>17.49</u>	<u>17.48</u>				
pH, (± 0.1)		<u>7.75</u>	<u>7.76</u>	<u>7.74</u>	<u>7.75</u>				
Sp. Conductance (µS/cm), (± 3%)		<u>0.347</u>	<u>0.349</u>	<u>0.348</u>	<u>0.347</u>				
DO (mg/L), (± 10% or 10% of 0.2mg/l)		<u>0.70</u>	<u>0.58</u>	<u>0.58</u>	<u>0.57</u>				
ORP (mV), (± 10%)		<u>82.1</u>	<u>74.6</u>	<u>70.2</u>	<u>67.2</u>				
Turbidity (NTU), (± 10% or 3 < 10 NTUs)		<u>4.43</u>	<u>3.00</u>	<u>2.00</u>	<u>2.30</u>				
Color		<u>clear</u>							
Odor/Evidence of LNAPL		<u>NOIS</u>							

Notes: (i.e. actions taken if well dewater, difficulties in sampling through LNAPL, problems during purging/sampling, etc.)

1 US Gallon = 3.8 Liters.

Special note re: analyses: Full VOCs list, RCRA8 + MNA for metals

Groundwater Purge and Sample Form (Minimal Drawdown)

Kennedy/Jenks Consultants

Date: 11/6/18 Well Number: **WMW-28**
 Project Name: **BNSF Wishram** Monument Type: Stickup (ft PVC) Flush: X
 Project Number: **1896120*05** Well Diameter (in): 2-inch PVC
 Sampling Personnel: JET Well Condition: good
 Water Level Meter: Solinst or Geotech OWI Total Casing Depth (ft): 17.0
 Purging Equipment: Peristaltic Pump, Tubing Screened Interval (ft): 7-17
 Sampling Equipment: Peristaltic Pump, Tubing Purge Depth (ft): 14
 Sampling Time: 1200 Depth to Groundwater (ft): 9.98
 Total Discharge (gal): _____ Depth to LNAPL (ft): —
 Water Disposal: On-Site 55-gallon drums Water Column (ft): _____
 Weather: Sunny Windy

Water Quality Meter(s)	Model	Calibration Date/Time	QA/QC Samples		
Temp/pH/SC/ORP/DO:	YSI 556	<u>11/5/18</u>	Type	Sample ID	Time
Turbidity:	Micro TPI		DUP	D-1-201811 <u>06</u>	<u>1205</u>
Other:					

Sample ID	Sample Containers				Field Filtered	Analyses Requested (X)		MS/MSD & Comments
	No.	Type	Pres.	Vol.				
	2	VOA	HCl	40 mL	No	VOCs (8260)	X	
	2	VOA	HCl	40 mL	No	NWTPH-Gx		
	2	VOA	HCl	40 mL	No	NWTPH-Dx NO SGC	X	
	2	VOA	HCl	40 mL	No	NWTPH-Dx WITH SGC		
	2	VOA	--	40 mL	No	PAHs (8270 SIM)		
	2	VOA	HCl	40 mL	No	Methane (RSK 175)	X	
	1	HDPE	H2SO4	250 mL	No	Nitrate-Nitrite (353.2) & Ammonia (350.1/350.3)	X	
	1	HDPE	none	125 mL	No	Sulfate (300.0)	X	
	1	HDPE	NaOH/ZnAc	125 mL	No	Sulfide (376.2)	X	
	1	HDPE	HNO3	250 mL	No	Tot. Metals (RCRA8) (6020)		
	1	HDPE	HNO3	250 mL	Yes	Diss. Metals (Mn,Fe)	X	

Total Containers 10

Time	1120	1125	1130	1135	1140	1145	1150	1155
Parameter (every 5 min)	5 min	10 min	15 min	20 min	25 min	30 min	35 min	40 min
Flow Rate (L/min)	<u>0.1</u>							
Volume Purged (Liters)	<u>0.5</u>	<u>1.0</u>	<u>1.5</u>	<u>2.0</u>	<u>2.5</u>	<u>3.0</u>	<u>3.5</u>	<u>4.0</u>
Water Depth (ft)	<u>10.05</u>	<u>10.05</u>	<u>10.05</u>	<u>10.06</u>	<u>10.06</u>	<u>10.06</u>	<u>10.07</u>	<u>10.07</u>
Temperature (°C), (± 0.2)	<u>17.62</u>	<u>17.66</u>	<u>17.56</u>	<u>17.55</u>	<u>17.67</u>	<u>17.59</u>	<u>17.55</u>	<u>17.60</u>
pH, (± 0.1)	<u>7.83</u>	<u>7.84</u>	<u>7.87</u>	<u>7.86</u>	<u>7.88</u>	<u>7.85</u>	<u>7.85</u>	<u>7.84</u>
Sp. Conductance ^m (µS/cm), (± 3%)	<u>0.431</u>	<u>0.445</u>	<u>0.440</u>	<u>0.480</u>	<u>0.443</u>	<u>0.439</u>	<u>0.442</u>	<u>0.433</u>
DO (mg/L), (± 10% or 10% of 0.2mg/l)	<u>0.69</u>	<u>0.50</u>	<u>0.41</u>	<u>0.37</u>	<u>0.38</u>	<u>0.38</u>	<u>0.34</u>	<u>0.36</u>
ORP (mV), (± 10%)	<u>71.0</u>	<u>66.5</u>	<u>62.9</u>	<u>64.9</u>	<u>58.9</u>	<u>56.7</u>	<u>56.0</u>	<u>54.6</u>
Turbidity (NTU), (± 10% or 3 < 10 NTUs)	<u>3.17</u>	<u>2.22</u>	<u>1.78</u>	<u>2.58</u>	<u>2.34</u>	<u>1.58</u>	<u>1.72</u>	<u>1.64</u>
Color	<u>clear</u>							
Odor/Evidence of LNAPL	<u>no/s</u>							

Notes: (i.e. actions taken if well dewater, difficulties in sampling through LNAPL, problems during purging/sampling, etc.)

1 US Gallon = 3.8 Liters.

Special note re: analyses: Full VOCs list, RCRA8 + MNA for metals

Groundwater Purge and Sample Form (Minimal Drawdown)

Kennedy/Jenks Consultants

Date: 11/6/16
 Project Name: BNSF Wisram
 Project Number: 1896120*05
 Sampling Personnel: BR/KET
 Water Level Meter: Solinst or Geotech OWI
 Purging Equipment: Peristaltic Pump, Tubing
 Sampling Equipment: Peristaltic Pump, Tubing
 Sampling Time: 1505
 Total Discharge (gal): _____
 Water Disposal: On-Site 55-gallon drums

Well Number: WMW-29
 Monument Type: Stickup: _____ (ft PVC) Flush: X
 Well Diameter (in): 2-inch PVC
 Well Condition: good
 Total Casing Depth (ft): 17.0
 Screened Interval (ft): 7-17
 Purge Depth (ft): 14
 Depth to Groundwater (ft): 11.14
 Depth to LNAPL (ft): —
 Water Column (ft): _____

Weather: Sunny / windy

Water Quality Meter(s)	Model	Calibration Date/Time	QA/QC Samples		
Temp/pH/SC/ORP/DO:	YSI 556		Type	Sample ID	Time
Turbidity:	Micro TPI				
Other:					

Sample ID	Sample Containers				Field Filtered	Analyses Requested (X)		MS/MSD & Comments
	No.	Type	Pres.	Vol.				
	2	VOA	HCl	40 mL	No	VOCs (8260)	X	
	2	VOA	HCl	40 mL	No	NWTPH-Gx		
	2	VOA	HCl	40 mL	No	NWTPH-Dx NO SGC	X	
	2	VOA	HCl	40 mL	No	NWTPH-Dx WITH SGC		
	2	VOA	--	40 mL	No	PAHs (8270 SIM)		
	2	VOA	HCl	40 mL	No	Methane (RSK 175)	X	
	1	HDPE	H2SO4	250 mL	No	Nitrate-Nitrite (353.2) & Ammonia (350.1/350.3)	X	
	1	HDPE	none	125 mL	No	Sulfate (300.0)	X	
	1	HDPE	NaOH/ZnAc	125 mL	No	Sulfide (376.2)	X	
	1	HDPE	HNO3	250 mL	No	Tot. Metals (RCRA8) (6020)		
	1	HDPE	HNO3	250 mL	Yes	Diss. Metals (Mn, Fe)	X	

Total Containers **10**

Parameter (every 5 min)	Time	0930	0935	0940	0945	0950	0955	1000	1005	1530
		5 min	10 min	15 min	20 min	25 min	30 min	35 min	40 min	
Flow Rate (L/min)		0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Volume Purged (Liters)		0.5	1.0	1.5	2.0	2.5	3.0	3.5	4.0	—
Water Depth (ft)		11.50	12.19	12.52	12.78	13.07	13.22	13.34	13.88	12.71
Temperature (°C), (± 0.2)		17.40	17.69	17.67	17.80	17.87	17.91	17.89	17.90	17.24
pH, (± 0.1)		7.01	6.86	6.86	6.84	6.82	6.83	6.84	6.84	7.4
Sp. Conductance (µS/cm), (± 3%)		1579	1587	1579	1550	1514	1565	1510	1518	134
DO (mg/L), (± 10% or 10% of 0.2mg/l)		2.40	0.94	0.72	0.53	0.43	0.46	0.55	0.60	1.71
ORP (mV), (± 10%)		139.5	124.2	107.4	81.8	44.5	20.3	-4.7	-16.0	96.1
Turbidity (NTU), (± 10% or 3 < 10 NTUs)		2.20	2.18	3.13	2.40	2.59	3.00	2.88	2.99	7.2
Color		Clear	CLEAR	CLEAR	—	—	—	—	—	110
Odor/Evidence of LNAPL		NA	—	—	—	—	—	—	—	200

Notes: (i.e. actions taken if well dewater, difficulties in sampling through LNAPL, problems during purging/sampling, etc.)

1 US Gallon = 3.8 Liters.

Special note re: analyses: Full VOCs list, RCRA8 + MNA for metals

1500: WL=11.14' sampled

Groundwater Purge and Sample Form (Minimal Drawdown)

Kennedy/Jenks Consultants

Date: 11/6/18
 Project Name: BNSF Wishram
 Project Number: 1896120*05
 Sampling Personnel: BENNY ROCHA
 Water Level Meter: Solinst or Geotech OWI
 Purging Equipment: Peristaltic Pump, Tubing
 Sampling Equipment: Peristaltic Pump, Tubing
 Sampling Time: 0800-1420
 Total Discharge (gal): _____
 Water Disposal: On-Site 55-gallon drums

Well Number: WMW-30
 Monument Type: Stickup: (ft PVC) Flush: X
 Well Diameter (in): 2-inch PVC
 Well Condition: Good
 Total Casing Depth (ft): 17.0
 Screened Interval (ft): 7-17
 Purge Depth (ft): _____
 Depth to Groundwater (ft): 10.59
 Depth to LNAPL (ft): NA
 Water Column (ft): _____

TOC

Weather: SUNNY w/ LIGHT WIND

Water Quality Meter(s)	Model	Calibration Date/Time	QA/QC Samples		
Temp/pH/SC/ORP/DO:	YSI 556	11/6/18 @ 0745	Type	Sample ID	Time
Turbidity:	Micro TPI				
Other:					

Sample ID	Sample Containers				Field Filtered	Analyses Requested (X)		MS/MSD & Comments
	No.	Type	Pres.	Vol.				
	2	VOA	HCl	40 mL	No	VOCs (8260)	X	
	2	VOA	HCl	40 mL	No	NWTPH-Gx		
	2	VOA	HCl	40 mL	No	NWTPH-Dx NO SGC	X	
	2	VOA	HCl	40 mL	No	NWTPH-Dx WITH SGC	X	
	2	VOA	--	40 mL	No	PAHs (8270 SIM)		
	2	VOA	HCl	40 mL	No	Methane (RSK 175)	X	
	1	HDPE	H2SO4	250 mL	No	Nitrate-Nitrite (353.2) & Ammonia (350.1/350.3)	X	
	1	HDPE	none	125 mL	No	Sulfate (300.0)	X	
	1	HDPE	NaOH/ZnAc	125 mL	No	Sulfide (376.2)	X	
	1	HDPE	HNO3	250 mL	No	Tot. Metals (RCRA8) (6020)		
	1	HDPE	HNO3	250 mL	Yes	Diss.Metals (Mn,Fe)	X	

Total Containers 12

Time	0805	0810	0815	0820	0825	0830	0835	0840	
Parameter (every 5 min)	5 min	10 min	15 min	20 min	25 min	30 min	35 min	40 min	
Flow Rate (L/min)	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Volume Purged (Liters)	0.5	1.0	1.5	2.0	2.5	3.0	3.5	4.0	
Water Depth (ft)	11.35	11.75	12.31	12.89	12.95	13.81	13.87	13.76	12.2
Temperature (°C), (± 0.2)	16.27	16.28	16.45	16.58	16.73	16.74	16.79	16.74	17.3
pH, (± 0.1)	8.14	7.54	7.27	7.22	7.18	7.16	7.19	7.23	7.9
Sp. Conductance (µS/cm), (± 3%)	0.735	0.642	0.633	0.637	0.624	0.627	0.630	0.633	0.7
DO (mg/L), (± 10% or 10% of 0.2mg/l)	0.82	0.59	0.44	0.42	0.50	0.88	1.10	1.36	2.2
ORP (mV), (± 10%)	163.4	181.1	189.9	190.7	188.7	180.4	169.9	154.8	88
Turbidity (NTU), (± 10% or 3 < 10 NTUs)	4.44	2.20	2.52	3.27	2.82	3.62	3.34	3.15	3.1
Color	clear	clear	clear	clear	clear	clear	clear	clear	
Odor/Evidence of LNAPL	NA								NO

Notes: (i.e. actions taken if well dewater, difficulties in sampling through LNAPL, problems during purging/sampling, etc.)

1 US Gallon = 3.8 Liters.

Special note re: analyses: Full VOCs list, NWTPH-Dx with AND without SGC, RCRA8 + MNA for metals

@1405: WL = 10.58', sampled @ 1420

Groundwater Purge and Sample Form (Minimal Drawdown)

Kennedy/Jenks Consultants

Date: 11/10/18
 Project Name: BNSF Wishram
 Project Number: 1896120*05
 Sampling Personnel: KET
 Water Level Meter: Solinst or Geotech OWI
 Purging Equipment: Peristaltic Pump, Tubing
 Sampling Equipment: Peristaltic Pump, Tubing
 Sampling Time: 0935
 Total Discharge (gal): _____
 Water Disposal: On-Site 55-gallon drums

Well Number: WMW-31
 Monument Type: Stickup: _____ (ft PVC) Flush:
 Well Diameter (in): 2-inch PVC
 Well Condition: good
 Total Casing Depth (ft): 17.0
 Screened Interval (ft): 7-17
 Purge Depth (ft): 14
 Depth to Groundwater (ft): 10.73
 Depth to LNAPL (ft): —
 Water Column (ft): _____

Weather: SUNNY, WINDY

Water Quality Meter(s)	Model	Calibration Date/Time	QA/QC Samples		
Temp/pH/SC/ORP/DO:	YSI 556	<u>11/5/18</u>	Type	Sample ID	Time
Turbidity:	Micro TPI				
Other:					

Sample ID	Sample Containers				Field Filtered	Analyses Requested (X)	MS/MSD & Comments
	No.	Type	Pres.	Vol.			
	<u>h2</u>	VOA	HCl	40 mL	No	VOCs (8260) X	
	2	VOA	HCl	40 mL	No	NWTPH-Gx	
	2	VOA	HCl	40 mL	No	NWTPH-Dx NO SGC X	
	2	VOA	HCl	40 mL	No	NWTPH-Dx WITH SGC	
	2	VOA	--	40 mL	No	PAHs (8270 SIM)	
	2	VOA	HCl	40 mL	No	Methane (RSK 175) X	
	1	HDPE	H2SO4	250 mL	No	Nitrate-Nitrite (353.2) & Ammonia (350.1/350.3) X	
	1	HDPE	none	125 mL	No	Sulfate (300.0) X	
	1	HDPE	NaOH/ZnAc	125 mL	No	Sulfide (376.2) X	
	1	HDPE	HNO3	250 mL	No	Tot. Metals (RCRA8) (6020)	
	1	HDPE	HNO3	250 mL	Yes	Diss.Metals (Mn,Fe) X	

Total Containers 10

Time	0855	0900	0905	0910	0915	0920	0925	0930
Parameter (every 5 min)	<u>5 min</u>	<u>10 min</u>	<u>15 min</u>	<u>20 min</u>	<u>25 min</u>	<u>30 min</u>	<u>35 min</u>	<u>40 min</u>
Flow Rate (L/min)	<u>0.1</u>							
Volume Purged (Liters)	<u>0.5</u>	<u>1.0</u>	<u>1.5</u>	<u>2.0</u>	<u>2.5</u>	<u>3.0</u>	<u>3.5</u>	<u>4.0</u>
Water Depth (ft)	<u>10.90</u>	<u>10.87</u>	<u>10.86</u>	<u>10.86</u>	<u>10.86</u>	<u>10.86</u>	<u>10.86</u>	<u>10.86</u>
Temperature (°C), (± 0.2)	<u>16.54</u>	<u>16.52</u>	<u>16.37</u>	<u>16.32</u>	<u>16.39</u>	<u>16.42</u>	<u>16.46</u>	<u>16.53</u>
pH, (± 0.1)	<u>7.62</u>	<u>7.37</u>	<u>7.38</u>	<u>7.34</u>	<u>7.34</u>	<u>7.33</u>	<u>7.36</u>	<u>7.37</u>
Sp. Conductance (µS/cm), (± 3%)	<u>0.823</u>	<u>0.845</u>	<u>0.859</u>	<u>0.898</u>	<u>0.909</u>	<u>0.900</u>	<u>0.888</u>	<u>0.883</u>
DO (mg/L), (± 10% or 10% of 0.2mg/l)	<u>0.73</u>	<u>0.49</u>	<u>0.42</u>	<u>0.46</u>	<u>0.45</u>	<u>0.46</u>	<u>0.44</u>	<u>0.43</u>
ORP (mV), (± 10%)	<u>118.3</u>	<u>115.2</u>	<u>106.0</u>	<u>100.4</u>	<u>93.0</u>	<u>88.5</u>	<u>83.8</u>	<u>77.1</u>
Turbidity (NTU), (± 10% or 3 <10 NTUs)	<u>7.13</u>	<u>3.55</u>	<u>2.08</u>	<u>2.58</u>	<u>1.78</u>	<u>2.03</u>	<u>1.76</u>	<u>1.94</u>
Color	<u>clear</u>							
Odor/Evidence of LNAPL	<u>no o/s</u>							

Notes: (i.e. actions taken if well dewater, difficulties in sampling through LNAPL, problems during purging/sampling, etc.)
 1 US Gallon = 3.8 Liters.
 Special note re: analyses: Full VOCs list, RCRA8 + MNA for metals

Groundwater Purge and Sample Form (Minimal Drawdown)

Kennedy/Jenks Consultants

Date: 11/6/18
 Project Name: BNSF Wishram
 Project Number: 1896120*05
 Sampling Personnel: KET
 Water Level Meter: Solinst or Geotech OWI
 Purging Equipment: Peristaltic Pump, Tubing
 Sampling Equipment: Peristaltic Pump, Tubing
 Sampling Time: 1550
 Total Discharge (gal): _____
 Water Disposal: On-Site 55-gallon drums

Well Number: WMW-32
 Monument Type: Stickup: _____ (ft PVC) Flush: X
 Well Diameter (in): 2-inch PVC
 Well Condition: good
 Total Casing Depth (ft): 17.0
 Screened Interval (ft): 7-17
 Purge Depth (ft): 14
 Depth to Groundwater (ft): 11.35
 Depth to LNAPL (ft): -
 Water Column (ft): _____

Weather: SUNNY

Water Quality Meter(s)	Model	Calibration Date/Time	QA/QC Samples		
Temp/pH/SC/ORP/DO:	YSI 556	<u>11/5/18</u>	Type	Sample ID	Time
Turbidity:	Micro TPI				
Other:					

Sample ID	Sample Containers				Field Filtered	Analyses Requested (X)		MS/MSD & Comments
	No.	Type	Pres.	Vol.				
	2	VOA	HCl	40 mL	No	VOCs (8260)	X	
	2	VOA	HCl	40 mL	No	NWTPH-Gx		
	2	VOA	HCl	40 mL	No	NWTPH-Dx NO SGC	X	
	2	VOA	HCl	40 mL	No	NWTPH-Dx WITH SGC		
	2	VOA	--	40 mL	No	PAHs (8270 SIM)		
	2	VOA	HCl	40 mL	No	Methane (RSK 175)	X	
	1	HDPE	H2SO4	250 mL	No	Nitrate-Nitrite (353.2) & Ammonia (350.1/350.3)	X	
	1	HDPE	none	125 mL	No	Sulfate (300.0)	X	
	1	HDPE	NaOH/ZnAc	125 mL	No	Sulfide (376.2)	X	
	1	HDPE	HNO3	250 mL	No	Tot. Metals (RCRA8) (6020)		
	1	HDPE	HNO3	250 mL	Yes	Diss. Metals (Mn, Fe)	X	

Total Containers 10

	Time	0820	0825	0830	0835	1000			
Parameter (every 5 min)		5 min	10 min	15 min	20 min	min	min	min	min
Flow Rate (L/min)	<u>0815</u>	<u>0.1</u>	<u>0.1</u>	<u>0.1</u>	<u>0.1</u>	<u>0.1</u>			
Volume Purged (Liters)		<u>0.5</u>	<u>1.0</u>	<u>1.5</u>	<u>2.0</u>	<u>-</u>			
Water Depth (ft)		<u>12.10</u>	<u>13.38</u>	<u>13.96</u>	<u>14.06</u>	<u>13.29</u>			
Temperature (°C), (± 0.2)		<u>17.41</u>	<u>17.78</u>	<u>17.78</u>	<u>16.75</u>	<u>17.64</u>			
pH, (± 0.1)		<u>7.91</u>	<u>7.76</u>	<u>7.66</u>	<u>7.60</u>	<u>8.00</u>			
Sp. Conductance (µS/cm), (± 3%)		<u>0.951</u>	<u>0.805</u>	<u>1.072</u>	<u>1.061</u>	<u>0.979</u>			
DO (mg/L), (± 10% or 10% of 0.2mg/l)		<u>2.51</u>	<u>0.84</u>	<u>0.79</u>	<u>2.44</u>	<u>2.43</u>			
ORP (mV), (± 10%)		<u>149.5</u>	<u>132.9</u>	<u>131.2</u>	<u>132.4</u>	<u>95.7</u>			
Turbidity (NTU), (± 10% or 3 <10 NTUs)		<u>1.31</u>	<u>1.77</u>	<u>2.07</u>	<u>5.25</u>	<u>6.43</u>			
Color		<u>clear</u>	<u>clear</u>	<u>clear</u>	<u>clear</u>	<u>clear</u>			
Odor/Evidence of LNAPL		<u>NO O/S</u>	<u>NO O/S</u>	<u>NO O/S</u>	<u>NO O/S</u>	<u>NO O/S</u>			

Notes: (i.e. actions taken if well dewater, difficulties in sampling through LNAPL, problems during purging/sampling, etc.)

1 US Gallon = 3.8 Liters.

Special note re: analyses: Full VOCs list, NWTPH-Gx, RCRA8 + MNA for metals

Well dewatered after 20 min.
1542 = WL - 11.35' sampled.