



Memorandum

Monitoring, Assessment and Stewardship

Date: July 31, 2017

To: AJ Downie, Director Authorizations South

Cc: Cindy Meays, Water Quality Section Head

Douglas Hill, Director Monitoring, Assessment and Stewardship

Re: Addendum to the review of water quality data from Cobble Hill Holdings contaminated soil facility

The purpose of the June 22, 2017 water quality data review conducted by M. Sokal (“Memo - SIA monitoring data review (MSokal 2017-06-22) FINAL”) was to determine if there was any evidence in the sampling data to suggest that the containment liner at the contaminated soil facility (Lot 23) was leaking, and if potential contaminants were being released to a nearby ephemeral stream. Based on the available data, the conclusions of that review indicated that there was no strong evidence to indicate that contaminants were leaching into the shallow aquifer at Lot 23 and then re-surfacing downstream in the ephemeral creek. Also, it was recommended that more information was needed about upgradient and nearby groundwater quality, and other ephemeral creek water quality, to make further conclusions about whether the concentrations at site S-3 were usual for the area or not.

This current memo is an addendum to that previous review, and provides an additional assessment of water quality data, which include: 1) recent data that was not available for the previous review, as it was still being analyzed by the analytical laboratory, and 2) additional historical permittee data.

Firstly, three additional samples from the ephemeral creek site (S-3) were collected by Hemmera in June 2017, to provide additional information to the monthly data collected by Associated Environmental (Table 1). These data, along with the June sampling data from Associated Environmental, were not available in time for the previous water quality review conducted by M. Sokal (June 22, 2017). Upon review, the addition of the June data does not change any of the assessments and conclusions provided in that memo. It was previously noted that there was an increasing trend in the ephemeral creek samples from March to early-June in several parameters, including conductivity, hardness, Cl, SO₄, Ca, and Mg. However, the later June data indicate some parameters decreased, while others increased slightly. Similarly, the

general increasing trend was also observed in South Shawnigan Creek samples, possibly due to increased contributions of groundwater throughout the spring.

Table 1. Select indicator water chemistry parameters from ephemeral creek site S-3. The italicized values are recent data, not previously available, and the shaded columns indicate data collected by Hemmera in June 2017. All other data were collected by Associated Environmental.

Site	S-3 (ephemeral stream)									
Sampling Date	2016-12-12	2017-01-18	2017-02-20	2017-03-20	2017-04-19	2017-05-25	2017-06-09	2017-06-13	2017-06-20	2017-06-23
Conductivity [uS/cm]	334	358	392	327	392	552	<i>664</i>	<i>665</i>	<i>586</i>	<i>604</i>
Hardness (as CaCO ₃) [mg/L]	104	112	151	124	164	230	<i>294</i>	<i>305</i>	<i>244</i>	<i>262</i>
Chloride (Cl) [mg/L]	28.7	40.4	33.6	21.5	26.6	37.6	<i>53.2</i>	<i>57.6</i>	<i>44.2</i>	<i>44.1</i>
Sulfate (SO ₄) [mg/L]	60.9	52.2	74.7	60.9	74.6	101	<i>113</i>	<i>120</i>	<i>115</i>	<i>118</i>
Cadmium (Cd)-Total [mg/L]	<0.000 0050	0.0000 069	<0.000 0050	<0.000 0050	0.0000 773	0.0000 096	<i>0.0000 118</i>	<i>0.0000 157</i>	<i>0.0000 092</i>	<i>0.0000 117</i>
Calcium (Ca)-Total [mg/L]	33.4	35.3	48.5	40.5	65.8	79	<i>96.4</i>	<i>92</i>	<i>79.1</i>	<i>85.5</i>
Copper (Cu)-Total [mg/L]	0.0011	0.003	0.00144	0.00144	0.0134	0.0017 2	<i>0.0010 3</i>	<i>0.0012 7</i>	<i>0.0011 9</i>	<i>0.0016 7</i>
Iron (Fe)-Total [mg/L]	0.0688	0.933	0.0436	0.0467	0.409	0.164	<i>0.004</i>	<i>0.0241</i>	<i>0.0105</i>	<i>0.0863</i>
Magnesium (Mg)-Total [mg/L]	6.04	6.05	7.39	6.21	8.59	11.1	<i>12.6</i>	<i>12.3</i>	<i>11.7</i>	<i>11.7</i>
Manganese (Mn)-Total [mg/L]	0.00332	0.0245	0.0326	0.0197	0.885	0.0595	<i>0.0375</i>	<i>0.0876</i>	<i>0.0744</i>	<i>0.221</i>
Sodium (Na)-Total [mg/L]	13.2	15.8	16.4	12.7	17.7	15.8	<i>19.2</i>	<i>20.1</i>	<i>17.2</i>	<i>17.4</i>

Secondly, historical data found in the appendices of several quarterly monitoring reports prepared by South Island Resource Management Ltd., from 2015 to 2017 for Permit PR-105809, were also reviewed (Appendices 1 and 2). These data include samples collected from two ephemeral creek sites, SW-1 (downgradient, and close to site S-3 established by AE) and

SW-2 (upgradient ephemeral creek site), along with one upgradient groundwater well (MW-4) sample collected before Lot 23 received any contaminated soil (Figure 1).

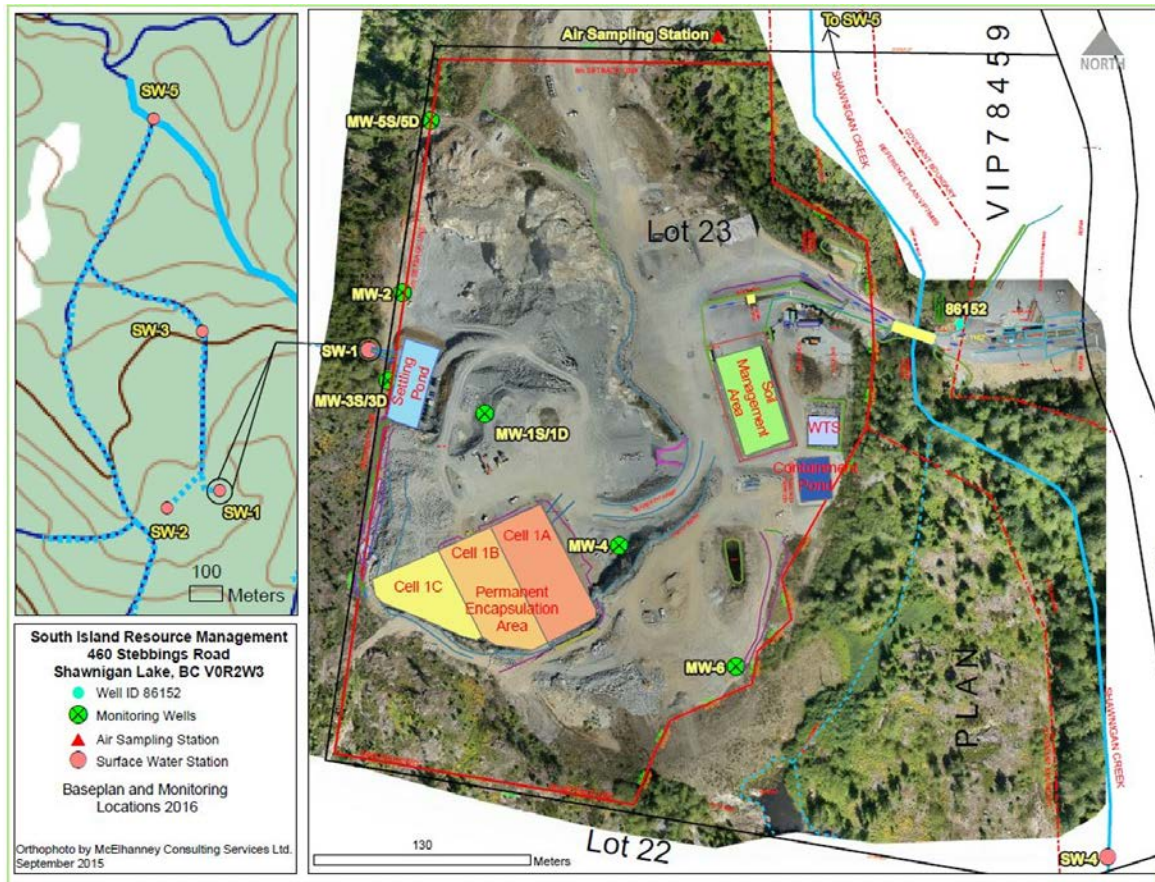


Figure 1. Surface water and groundwater sampling site location map

Surface water monitoring site SW-1 was a permitted monitoring site in the ephemeral creek that represents downgradient water quality conditions from Lot 23, and is very close to the recently established site S-3. The earliest available data for site SW-1 can be found in Appendix 1, and represents water quality before (February 2012 to March 2014) Lot 23 received contaminated soil, and very shortly after (June 2014) contaminated soil delivery to the site began. These historical data are quite similar to the more recent December 2016 to June 2017 data from ephemeral creek site S-3. While some parameters are a little higher, and others a little lower, the data are reasonably comparable. Also, the historical upgradient groundwater well MW-4 (replaced by well MW-6 in 2015), was sampled before contaminated soil arrived on site. This early groundwater data is only from one sample date (September 19, 2013), but it indicates similar water chemistry to site SW-1 (Appendix 1). This further reinforces the evidence of naturally elevated concentrations of several major ions and metals in the groundwater (i.e., 2016 quarterly data from well MW-6), and a strong connection with the downgradient ephemeral creek.

Ephemeral creek site SW-2 has also been sampled from 2012-2016, as part of Permit PR-105809. This site is upgradient to Lot 23, and the data is relatively consistent over the five years of sampling, with generally low concentrations of most parameters (Appendix 2). The water chemistry is very different from the groundwater dominated SW-1 and S-3 sites, and while not directly comparable, are more similar to the upstream surface water dominated sites in South Shawnigan Creek (S-1 and S-2). The majority of the samples from SW-2 were collected in the spring and fall, and as a result, it is not known if water flows at the site during the summer low flow period. The water quality at site SW-2 does not appear to be influenced by the activities at Lot 23, and also does not appear to have a strong connection to local groundwater. However, additional data would be required to make any further conclusions.

Based on the available data in the June 22, 2017 water quality data review conducted by M. Sokal (“Memo - SIA monitoring data review (MSokal 2017-06-22) FINAL”), and in this addendum to that memo, there is no strong evidence to indicate that contaminants are leaching into the shallow aquifer at Lot 23 and then re-surfacing downstream in the ephemeral creek. However, with additional data from upgradient and nearby groundwater, along with a comprehensive assessment of results, more definitive conclusions could be reached.

If you have any further questions, comments or concerns, please do not hesitate to contact me.

Thank you,

Michael Sokal, Ph.D.

Impact Assessment Biologist

Environmental Protection

Ministry of Environment

102 Industrial Place, Penticton BC V2A 7C8

Tel: [\(250\) 490-2284](tel:2504902284) Fax: [\(250\) 490-2231](tel:2504902231)

E-mail: Mike.Sokal@gov.bc.ca

Appendix 1. Water chemistry parameters from ephemeral creek site SW-1 (February 2012 – June 2014) and upgradient groundwater well site MW-4 (September 2013), before or near the time of the first contaminated soil loads arrived at Lot 23.

Site SW-1 (E305365)								
Permit related site, downgradient, ephemeral creek 1								GW well
Note: April 2014 = Approx time of receipt of first contaminated soils								MW-4
Date Sampled	2012-Feb-13	2012-Jul-03	2013-May-05	2014-Mar-19	2014-Jun-05	2014-Jun-12	2014-Jun-30	2013-Sep-19
Physical Tests								
Colour, True (Colour Units)	<5.0	<5	<5.0	<5.0	<5.0	<5.0	<5	
Conductivity	257	504	333	577	556	547	605	792
Hardness (as CaCO3)	122	234	169	-	192	255	310	296
pH	7.95	7.44	7.71	7.85	7.94	7.79	8.08	7.93
Total Suspended Solids	-	-	-	<3	11	50	<3	-
Total Dissolved Solids	171	488	212	340	316	379	410	467
Turbidity (NTU)	62.8	0.96	70.2	8.35	24.8	27.5	0.74	22
Anions and Nutrients								
Alkalinity Total (as CaCO3)	68.5	45.5	80.1	80.2	89.9	126	183	326
Chloride (Cl)	6.1	10.2	4.62	86.6	59.7	22.3	12.6	34.2
Fluoride (F)	0.042	<	0.034	0.054	0.055	0.056	0.062	<
Nitrate (as N)	2.3	34.9	1.4	3.3	7.84	10.6	9.83	0.053
Nitrite (as N)	<	0.02	0.0094	0.0315	0.201	0.24	0.222	0.014
Sulfate (SO4) H O-30 mg/L	49.2	60.5	75.9	66.4	66.6	87.9	97.8	61.1
Total Metals								
Aluminum (Al)-Total	2.29	0.431	4.56	1.63	0.434	0.045	0.045	-
Antimony (Sb)-Total	<	<	<	<	<0.0005	<0.0005	<0.0005	-
Arsenic (As)-Total	0.00019	0.00015	0.00061	0.00029	0.00021	0.00018	0.00018	-
Barium (Ba)-Total	<	0.034	0.034	0.031	0.029	0.03	0.03	-
Boron (B)-Total	<	<	<	<	<0.10	<0.10	<0.10	-
Cadmium (Cd)-Total	<	<	<	<	<0.0002	<0.0002	<0.0002	-
Calcium (Ca)-Total	42.3	73.7	53.1	58.6	77.3	102	102	-
Chromium (Cr)-Total	0.0052	<	0.008	0.0077	<0.002	<0.002	<0.002	-
Copper (Cu)-Total	0.0054	0.0015	0.012	0.0045	0.0026	0.001	0.001	-
Iron (Fe)-Total	2.47	0.379	4.71	1.51	0.264	0.077	0.077	-
Lead (Pb)-Total	0.0007	<	0.00177	0.00067	<0.0005	<0.0005	<0.0005	-
Magnesium (Mg)-Total	6.43	11.9	8.8	10.8	11.3	13.9	13.9	-
Manganese (Mn)-Total	0.0482	0.0517	0.423	0.0747	0.107	0.0911	0.0911	-
Mercury (Hg)-Total	<	<	<	<	<0.0002	<0.0002	<0.0002	-
Molybdenum (Mo)-Total	-	-	-	-	-	-	-	-
Potassium (K)-Total	0.86	1.12	1.19	2.49	1.62	1.58	1.58	-
Selenium (Se)-Total	<	<	<	<	<0.001	<0.001	<0.001	-
Sodium (Na)-Total	5.4	9.2	5.9	39.1	18.9	14.3	14.3	-
Uranium (U)-Total	0.00044	<	0.00043	0.00094	0.0012	0.0022	0.0022	-
Zinc (Zn)-Total	<	<	<	<	<0.05	<0.05	<0.05	-
Dissolved Metals								
Aluminum (Al)-Dissolved	0.01	0.02	-	<	0.033	<0.01	<0.01	<
Antimony (Sb)-Dissolved	<	<	-	<	<0.0005	<0.0005	<0.0005	<
Arsenic (As)-Dissolved	<	<	-	0.00015	0.00012	0.00013	0.00013	0.00062
Barium (Ba)-Dissolved	<	0.035	-	0.02	0.026	0.028	0.028	0.05
Boron (B)-Dissolved	<	<	-	<	<0.1	<0.1	<0.1	<
Cadmium (Cd)-Dissolved	<	<	-	<	<0.0002	<0.0002	<0.0002	<
Calcium (Ca)-Dissolved	40.4	74.2	-	59.7	82.3	101	101	111
Chromium (Cr)-Dissolved (8)	<	<	-	<	<0.002	<0.002	<0.002	<
Copper (Cu)-Dissolved	0.0012	0.0011	-	0.0039	<0.001	<0.001	<0.001	<
Iron (Fe)-Dissolved	<	<	-	<	<0.03	<0.03	<0.03	0.041
Lead (Pb)-Dissolved	<	<	-	<	<0.0005	<0.0005	<0.0005	<
Magnesium (Mg)-Dissolved	5.23	11.8	-	10.4	12.1	13.8	13.8	14.8
Manganese (Mn)-Dissolved	0.0049	0.0351	-	0.0481	0.0418	0.08	0.08	0.34
Mercury (Hg)-Dissolved	<	<	-	<	<0.0002	<0.0002	<0.0002	<
Molybdenum (Mo)-Dissolved	-	-	-	-	-	-	-	0.25
Potassium (K)-Dissolved	0.64	1.08	-	2.36	1.62	1.46	1.46	22.5
Selenium (Se)-Dissolved	<	<	-	<	<0.001	<0.001	<0.001	<
Sodium (Na)-Dissolved	4.9	9	-	39.9	20.3	13.9	13.9	36.9
Uranium (U)-Dissolved	0.0004	<	-	0.0009	0.00136	0.00223	0.00223	0.00233
Zinc (Zn)-Dissolved	<	<	-	<	<0.05	<0.05	<0.05	<

Appendix 2. Water chemistry parameters from ephemeral creek site SW-2 (February 2012 – December 2016).

Site SW-2 (E305362)		Permit related site, upgradient, ephemeral creek 1																											
Date sampled	2012-Feb-13	2012-Jul-03	2013-May-05	2014-Mar-19	2014-Jun-05	2014-Jun-12	2014-Jun-19	2014-Jun-24	2014-Jun-30	2015-Apr-09	2015-Jun-07	2015-Jun-13	2015-Nov-02	2015-Nov-10	2015-Nov-18	2015-Nov-23	2015-Nov-26	2016-May-04	2016-May-10	2016-May-17	2016-May-26	2016-Jun-12	2016-Nov-22	2016-Nov-28	2016-Dec-05	2016-Dec-14			
Physical Tests																													
Colour, True (Colour Units)	10	25.4	6.8	12.7	18.5	22.8	26.4	19.9	38.3	23	-	-	26	17	20	15	14	7	5	6	6	7	18	17	16	15			
Conductivity (uS/cm)	21.9	35.6	22.6	19.8	35.6	29.8	31.6	32	32	24	33	31	34	22	19	20	22	29	31	34	31	34	22	20	21	20			
Hardness (as CaCO3)	7.16	15.6	8.81	7.22	11.9	10.9	8.87	9.76	8.47	8.04	9.5	9	11.6	8.42	6.45	10.4	8.56	10.6	10.5	12	10.4	12.4	7.57	6.48	6.45	6.32			
pH	6.58	7.45	6.67	6.77	7.44	6.94	6.83	6.38	6.85	6.13	6.02	6.33	6	6.47	6.45	6.35	6.48	5.89	6.72	6.64	6.07	5.86	6.45	6.22	6.06	6.36			
Total Suspended Solids	-	-	<3	4.1	23.9	31.7	3.69	6.4	8	-	-	<2	<2	<2	<2	<2	<2	<2	<2	<2	2	<2	1	1	1	1			
Total Dissolved Solids	22	35	22	23	34	34	39	41	60	12	15	15	25	22	18	19	27	20	43	30	27	35	36	26	27	24			
Turbidity (NTU)	3.73	4.71	0.17	0.25	1.86	4.31	8.63	3.44	4.08	0.8	-	-	0.4	0.2	0.2	0.2	0.2	0.4	0.7	0.66	0.59	0.28	0.24	0.17	0.18	0.17			
Anions and Nutrients																													
Alkalinity Total (as CaCO3)	4.4	15.6	7.9	5.9	14.8	13	14.9	8.5	11.8	8	14	14	3	6	5	6	7	12	12	14	11	14	6	6	5	5			
Chloride (Cl)	2.76	1.78	1.23	1.22	1.17	1.18	1.21	1.38	1.27	0.99	1.05	0.99	1.05	1.22	1.05	0.98	1.05	1.34	1.34	1.3	2.14	1.3	1.31	1.15	1.09	1.11			
Fluoride (F)	<	<	<	<0.02	<0.002	<0.02	<0.02	<0.02	<0.02	0.03	0.02	<0.02	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	0.05	0.05	0.05			
Nitrate (as N)	<	<	<	<0.005	<0.005	<0.005	0.0059	0.0052	0.0051	0.046	0.011	0.006	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.005	0.005	0.005	0.018			
Nitrite (as N)	<	<	<	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.005	<0.005	<0.005	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.005	0.005	0.005	0.005			
Sulfate (SO4)	1.45	<	1.29	1.38	<0.5	<0.5	<0.5	<0.5	1.21	1.3	<0.5	<0.5	1.7	1.4	1.4	1.5	<1.0	<1.0	<1.0	<1.0	<1.0	0.5	1.3	1.2	1.3				
Total Metals																													
Aluminum (Al)-Total	0.192	0.341	0.232	0.132	0.097	0.317	0.52	1.27	0.289	0.256	0.212	1.05	0.147	0.12	0.144	0.123	0.106	0.084	0.058	0.046	0.047	0.047	0.108	0.119	0.093	0.104			
Antimony (Sb)-Total	<	<	<	<	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	0.0005	0.0005	0.0005	0.0005			
Arsenic (As)-Total	0	0.00025	0.00013	0.00013	0.0002	0.00016	0.0002	0.00136	0.00028	0.0005	0.0002	0.0004	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	0.00025	0.00025	0.00025	0.00025	0.00025			
Barium (Ba)-Total	<	<	<	<	<0.020	<0.02	<0.02	0.06	0.02	0.0036	0.0052	0.011	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.0025	0.0025	0.0025	0.0025	0.0025			
Boron (B)-Total	<	<	<	<	<0.1	<0.1	<0.1	<0.1	<0.1	<0.005	<0.005	<0.005	0.015	0.005	0.004	0.006	0.007	0.01	0.004	0.006	0.005	<0.004	0.009	0.014	0.01	0.014			
Cadmium (Cd)-Total	<	<	<	<	<0.0002	<0.0002	<0.0002	0.00027	<0.0002	<0.0001	<0.00001	0.00001	<0.00001	<0.00001	<0.00001	<0.00001	0.00002	0.00002	<0.00001	<0.00001	<0.00001	0.00005	0.00005	0.00005	0.00005	0.00005			
Calcium (Ca)-Total	2.26	4.59	2.54	2.12	3.32	2.99	2.97	3.65	2.43	2.28	3.03	2.68	3.4	2.5	1.9	2.8	2.5	3.5	3.4	3.6	3.2	3.7	2.5	2	2.2	2.3			
Chromium (Cr)-Total	<	<	<	<	<0.002	<0.002	<0.002	0.0115	<0.002	<0.0005	<0.0005	0.0017	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	0.0005	<0.0005	0.0005	0.0005	0.0005	0.0005	0.0006			
Copper (Cu)-Total	0.0011	0.0012	<	<	<0.001	<0.0001	0.0012	0.0168	0.0011	0.0009	0.0007	0.0021	0.0011	0.0007	0.0009	0.0007	0.0008	0.0014	0.0005	0.0004	0.0004	0.0003	0.0006	0.0009	0.0005	0.0006			
Iron (Fe)-Total	0.548	2.74	0.189	0.524	1.36	1.26	1.94	10.6	3.17	0.284	1.58	4.08	0.04	0.05	0.04	0.05	0.07	0.06	0.07	0.06	0.07	0.06	0.06	0.04	0.05	0.05			
Lead (Pb)-Total	<	<	<	<	<0.0005	<0.0005	<0.0005	0.00371	<0.0005	0.00011	0.0001	0.00046	<0.0001	<0.0001	<0.0001	<0.0001	0.0001	0.0001	<0.0001	0.0001	0.0001	<0.0001	0.00005	0.00005	0.00005	0.00005			
Magnesium (Mg)-Total	0.52	1.02	0.6	0.47	0.84	0.77	0.73	2.08	0.59	0.569	0.67	0.71	0.76	0.53	0.43	0.81	0.53	0.79	0.73	0.79	0.71	0.89	0.49	0.46	0.43	0.44			
Manganese (Mn)-Total	0.0123	0.0514	0.018	0.0551	0.496	0.146	0.163	0.334	0.198	0.014	0.159	0.215	0.0032	0.0026	0.003	0.002	0.0018	0.0035	0.0059	0.00669	0.00669	0.00562	0.0032	0.0022	0.002	0.0018			
Mercury (Hg)-Total	<	<	<	<	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.00001	<0.01	<0.01	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	0.00001	0.00001	0.00001	0.00001			
Molybdenum (Mo)-Total	<	<	<	<	<	<	<	<	<	<0.0001	<0.0001	0.0002	<0.0001	0.0001	<0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0005	0.0001	0.0005	0.0005			
Potassium (K)-Total	<	0.18	0.11	0.17	0.11	0.14	0.19	0.53	0.26	<0.1	-	-	0.11	<0.02	0.05	0.02	<0.02	0.1	0.09	0.11	0.12	0.14	0.05	0.05	0.03	0.04			
Selenium (Se)-Total	<	<	<	<	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	0.00025	0.00025	0.00025	0.00025			
Sodium (Na)-Total	<	<	<	<	2.1	2.1	<2	2.3	<2	1.65	2	1.9	1.63	1.42	1.24	1.22	1.56	1.87	1.8	1.94	1.79	1.95	1.39	1.27	1.22	1.16			
Uranium (U)-Total	<	<	<	<	<0.0001	<0.0001	<0.0001	0.00023	<0.0001	<0.0001	<0.00001	0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	0.00001	0.00001	0.00001	0.00001	0.00001			
Zinc (Zn)-Total	<	<	<	<	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.005	<0.005	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	0.012	<0.004	0.002	0.002	0.002	0.002			
Dissolved Metals																													
Aluminum (Al)-Dissolved	0.07	0.05	-	0.09	0.076	0.108	0.116	0.494	0.145	0.097	0.118	0.156	0.101	0.104	0.122	0.098	0.104	0.061	0.044	0.04	0.029	0.038	0.098	0.111	0.091	0.086			
Antimony (Sb)-Dissolved	<	<	<	<	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	0.00005	0.00005	0.0001	0.00005			
Arsenic (As)-Dissolved	<	0.00014	-	<	0.00015	0.00013	0.00017	0.00037	0.00019	<0.0001	0.0001	0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	0.00025	0.00025	0.00025	0.00025	0.00025			
Barium (Ba)-Dissolved	<	<	<	<	<0.02	<0.02	<0.02	0.01	<0.02	0.003	0.0048	0.0066	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.0025	0.0025	0.0025	0.0025	0.0025			
Boron (B)-Dissolved	<	<	<	<	<0.1	<0.1	<0.1	<0.1	<0.1	0.006	0.004	0.003	<0.004	<0.004	<0.004	0.005	0.006	0.007	0.007	0.007	0.005	0.004	0.00005	0.00005	0.00005	0.00005			
Cadmium (Cd)-Dissolved	<	<	<	<	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	0.000005	0.000005	0.00002	0.00				