



ENVIRONMENTAL DYNAMICS INC.
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Date Received: 30-DEC-13
Report Date: 06-JAN-14 09:59 (MT)
Version: FINAL

Client Phone: 867-393-4882

Certificate of Analysis

Lab Work Order #: L1407318
Project P.O. #: NOT SUBMITTED
Job Reference: 13-Y-0452
C of C Numbers: 1, 2
Legal Site Desc:

Can Dang
Senior Account Manager

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ALS ENVIRONMENTAL ANALYTICAL REPORT

	Sample ID Description Sampled Date Sampled Time Client ID	L1407318-1 SURFACE WATE 27-DEC-13 09:43 X14	L1407318-2 SURFACE WATE 27-DEC-13 10:17 X10	L1407318-3 SURFACE WATE 27-DEC-13 11:00 X3A	L1407318-4 SURFACE WATE 27-DEC-13 12:10 X2	L1407318-5 SURFACE WATE 27-DEC-13 13:00 NF2
Grouping	Analyte					
WATER						
Physical Tests	Conductivity (uS/cm)	578	301	291	287	288
	Hardness (as CaCO3) (mg/L)	279	146	139	138	138
	pH (pH)	8.05	8.01	8.00	7.94	7.93
	Total Suspended Solids (mg/L)	2.8	1.2	1.2	1.2	1.4
	Total Dissolved Solids (mg/L)	361	168	161	160	161
Anions and Nutrients	Alkalinity, Total (as CaCO3) (mg/L)	155	129	125	122	123
	Ammonia, Total (as N) (mg/L)	0.0670	0.0127	0.0157	0.0088	0.0073
	Chloride (Cl) (mg/L)	<0.50	<0.50	<0.50	<0.50	<0.50
	Fluoride (F) (mg/L)	0.142	0.151	0.147	0.159	0.162
	Nitrate (as N) (mg/L)	0.196	0.214	0.215	0.234	0.241
	Nitrite (as N) (mg/L)	<0.0010	<0.0010	0.0012	<0.0010	<0.0010
	Phosphorus (P)-Total (mg/L)	<0.0020	0.0030	0.0037	0.0046	0.0049
	Sulfate (SO4) (mg/L)	155	31.3	29.7	30.2	31.2
	Anion Sum (meq/L)	6.35	3.25	3.13	3.10	3.13
	Cation Sum (meq/L)	5.97	3.08	2.94	2.94	2.94
	Cation - Anion Balance (%)	-3.0	-2.8	-3.1	-2.6	-3.2
Organic / Inorganic Carbon	Dissolved Organic Carbon (mg/L)	1.52	1.56	1.57 ^{SFP}	1.45	1.52
	Total Organic Carbon (mg/L)	1.45	1.56	1.56	1.47	1.43
Total Metals	Aluminum (Al)-Total (mg/L)	0.0341	0.0093	0.0104	0.0207	0.0245
	Antimony (Sb)-Total (mg/L)	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
	Arsenic (As)-Total (mg/L)	0.00041	0.00031	0.00041	0.00051	0.00058
	Barium (Ba)-Total (mg/L)	0.0651	0.0678	0.0658	0.0674	0.0681
	Beryllium (Be)-Total (mg/L)	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
	Bismuth (Bi)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Boron (B)-Total (mg/L)	<0.010	<0.010	<0.010	<0.010	<0.010
	Cadmium (Cd)-Total (mg/L)	0.000183	0.000155	0.000219	0.000342	0.000577
	Calcium (Ca)-Total (mg/L)	83.4	42.5	40.4	39.3	39.1
	Chromium (Cr)-Total (mg/L)	0.00018	0.00012	0.00013	0.00017	0.00017
	Cobalt (Co)-Total (mg/L)	0.00241	0.00084	0.00126	0.00219	0.00368
	Copper (Cu)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	0.00058
	Iron (Fe)-Total (mg/L)	0.694	0.328	0.258	0.250	0.242
	Lead (Pb)-Total (mg/L)	0.000297	0.000154	0.000210	0.000414	0.000385
	Lithium (Li)-Total (mg/L)	0.00668	0.00538	0.00557	0.00691	0.00653
	Magnesium (Mg)-Total (mg/L)	18.6	10.3	9.07	9.73	10.1
	Manganese (Mn)-Total (mg/L)	2.71	0.100	0.125	0.152	0.189
	Molybdenum (Mo)-Total (mg/L)	0.000672	0.000668	0.000649	0.000769	0.000801

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

	Sample ID Description Sampled Date Sampled Time Client ID	L1407318-6 SURFACE WATE 27-DEC-13 13:11 NF2A	L1407318-7 SURFACE WATE 27-DEC-13 13:15 NF2B	L1407318-8 SURFACE WATE 27-DEC-13 15:02 R10	L1407318-9 SURFACE WATE 27-DEC-13 15:13 R09	L1407318-10 SURFACE WATE 27-DEC-13 15:25 R08
Grouping	Analyte					
WATER						
Physical Tests	Conductivity (uS/cm)	337	264	260	258	231
	Hardness (as CaCO3) (mg/L)	167	135	132	134	110
	pH (pH)	7.87	8.00	8.04	8.16	8.12
	Total Suspended Solids (mg/L)	1.9	<1.0	<1.0	<1.0	<1.0
	Total Dissolved Solids (mg/L)	200	150	145	146	125
Anions and Nutrients	Alkalinity, Total (as CaCO3) (mg/L)	123	125	120	120	117
	Ammonia, Total (as N) (mg/L)	0.0177	0.0089	0.0082	0.0117	0.0153
	Chloride (Cl) (mg/L)	<0.50	<0.50	<0.50	<0.50	<0.50
	Fluoride (F) (mg/L)	0.210	0.142	0.143	0.146	0.146
	Nitrate (as N) (mg/L)	0.253	0.236	0.226	0.230	0.139
	Nitrite (as N) (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Phosphorus (P)-Total (mg/L)	<0.0020	0.0053	0.0058	0.0056	0.0059
	Sulfate (SO4) (mg/L)	57.0	19.8	19.3	19.0	9.28
	Anion Sum (meq/L)	3.68	2.93	2.82	2.82	2.54
	Cation Sum (meq/L)	3.66	2.86	2.80	2.84	2.33
	Cation - Anion Balance (%)	-0.4	-1.2	-0.5	0.2	-4.5
Organic / Inorganic Carbon	Dissolved Organic Carbon (mg/L)	1.51	1.45	1.46	1.48	1.47
	Total Organic Carbon (mg/L)	1.46	1.40	1.33	1.43	1.41
Total Metals	Aluminum (Al)-Total (mg/L)	0.0433	0.0224	0.0144	0.0224	0.0105
	Antimony (Sb)-Total (mg/L)	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
	Arsenic (As)-Total (mg/L)	0.00049	0.00060	0.00063	0.00058	0.00058
	Barium (Ba)-Total (mg/L)	0.0682	0.0682	0.0693	0.0654	0.0582
	Beryllium (Be)-Total (mg/L)	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
	Bismuth (Bi)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Boron (B)-Total (mg/L)	<0.010	<0.010	<0.010	<0.010	<0.010
	Cadmium (Cd)-Total (mg/L)	0.00210	0.000019	0.000015	<0.000010	<0.000010
	Calcium (Ca)-Total (mg/L)	41.0	39.9	40.1	40.0	32.8
	Chromium (Cr)-Total (mg/L)	0.00016	0.00020	0.00015	0.00018	0.00015
	Cobalt (Co)-Total (mg/L)	0.0134	<0.00010	<0.00010	<0.00010	<0.00010
	Copper (Cu)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Iron (Fe)-Total (mg/L)	0.458	0.145	0.145	0.154	0.146
	Lead (Pb)-Total (mg/L)	0.000712	0.000473	0.000079	0.000065	<0.000050
	Lithium (Li)-Total (mg/L)	0.00752	0.00618	0.00638	0.00617	0.00543
	Magnesium (Mg)-Total (mg/L)	15.0	8.47	8.69	8.18	6.16
	Manganese (Mn)-Total (mg/L)	0.595	0.0225	0.0302	0.0251	0.0228
	Molybdenum (Mo)-Total (mg/L)	0.000808	0.000810	0.000794	0.000817	0.000726

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ALS ENVIRONMENTAL ANALYTICAL REPORT

	Sample ID Description Sampled Date Sampled Time Client ID	L1407318-11 SURFACE WATE 27-DEC-13 11:20 X3A-R	L1407318-12 SURFACE WATE 27-DEC-13 FARO 27-DEC13-F (FIELD BLANK)	L1407318-13 SURFACE WATE 27-DEC-13 TRAVEL BLANK	
Grouping	Analyte				
WATER					
Physical Tests	Conductivity (uS/cm)	293	<2.0	<2.0	
	Hardness (as CaCO3) (mg/L)	136	<0.50	<0.50	
	pH (pH)	8.04	5.99	5.72	
	Total Suspended Solids (mg/L)	<1.0	<1.0	<1.0	
	Total Dissolved Solids (mg/L)	160	<1.0	<1.0	
Anions and Nutrients	Alkalinity, Total (as CaCO3) (mg/L)	125	<2.0	<2.0	
	Ammonia, Total (as N) (mg/L)	0.0166	<0.0050	0.0081 ^{RRV}	
	Chloride (Cl) (mg/L)	<0.50	<0.50	<0.50	
	Fluoride (F) (mg/L)	0.158	<0.020	<0.020	
	Nitrate (as N) (mg/L)	0.222	<0.0050	<0.0050	
	Nitrite (as N) (mg/L)	<0.0010	<0.0010	<0.0010	
	Phosphorus (P)-Total (mg/L)	0.0042	<0.0020	<0.0020	
	Sulfate (SO4) (mg/L)	29.9	<0.50	<0.50	
	Anion Sum (meq/L)	3.14	<0.10	<0.10	
	Cation Sum (meq/L)	2.88	<0.10	<0.10	
	Cation - Anion Balance (%)	-4.3	0.0	0.0	
Organic / Inorganic Carbon	Dissolved Organic Carbon (mg/L)	1.47	<0.50		
	Total Organic Carbon (mg/L)	1.51	<0.50	<0.50	
Total Metals	Aluminum (Al)-Total (mg/L)	0.0124	<0.0030	<0.0030	
	Antimony (Sb)-Total (mg/L)	<0.00010	<0.00010	<0.00010	
	Arsenic (As)-Total (mg/L)	0.00038	<0.00010	<0.00010	
	Barium (Ba)-Total (mg/L)	0.0591	<0.000050	<0.000050	
	Beryllium (Be)-Total (mg/L)	<0.00010	<0.00010	<0.00010	
	Bismuth (Bi)-Total (mg/L)	<0.00050	<0.00050	<0.00050	
	Boron (B)-Total (mg/L)	<0.010	<0.010	<0.010	
	Cadmium (Cd)-Total (mg/L)	0.000188	<0.000010	<0.000010	
	Calcium (Ca)-Total (mg/L)	39.7	<0.020	<0.020	
	Chromium (Cr)-Total (mg/L)	0.00013	<0.00010	<0.00010	
	Cobalt (Co)-Total (mg/L)	0.00113	<0.00010	<0.00010	
	Copper (Cu)-Total (mg/L)	<0.00050	<0.00050	<0.00050	
	Iron (Fe)-Total (mg/L)	0.234	<0.010	<0.010	
	Lead (Pb)-Total (mg/L)	0.000202	<0.000050	<0.000050	
	Lithium (Li)-Total (mg/L)	0.00517	<0.00050	<0.00050	
	Magnesium (Mg)-Total (mg/L)	9.04	<0.0050	<0.0050	
	Manganese (Mn)-Total (mg/L)	0.111	<0.000050	<0.000050	
	Molybdenum (Mo)-Total (mg/L)	0.000561	<0.000050	<0.000050	

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Sample ID Description Sampled Date Sampled Time Client ID		L1407318-1 SURFACE WATE 27-DEC-13 09:43 X14	L1407318-2 SURFACE WATE 27-DEC-13 10:17 X10	L1407318-3 SURFACE WATE 27-DEC-13 11:00 X3A	L1407318-4 SURFACE WATE 27-DEC-13 12:10 X2	L1407318-5 SURFACE WATE 27-DEC-13 13:00 NF2
Grouping	Analyte					
WATER						
Total Metals	Nickel (Ni)-Total (mg/L)	0.00571	0.00246	0.00253	0.00364	0.00564
	Phosphorus (P)-Total (mg/L)	<0.30	<0.30	<0.30	<0.30	<0.30
	Potassium (K)-Total (mg/L)	1.52	1.02	1.01	0.927	0.936
	Selenium (Se)-Total (mg/L)	0.00037	0.00038	0.00035	0.00040	0.00042
	Silicon (Si)-Total (mg/L)	5.79	5.42	5.42	5.74	5.93
	Silver (Ag)-Total (mg/L)	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
	Sodium (Na)-Total (mg/L)	5.26	2.72	2.73	2.88	2.92
	Strontium (Sr)-Total (mg/L)	0.294	0.196	0.193	0.181	0.174
	Thallium (Tl)-Total (mg/L)	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
	Tin (Sn)-Total (mg/L)	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
	Titanium (Ti)-Total (mg/L)	<0.010	<0.010	<0.010	<0.010	<0.010
	Uranium (U)-Total (mg/L)	0.00284	0.00238	0.00229	0.00217	0.00216
	Vanadium (V)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Zinc (Zn)-Total (mg/L)	0.256	0.299	0.333	0.486	0.813
	Zirconium (Zr)-Total (mg/L)	<0.00080	<0.00080	<0.00080	<0.00080	<0.00080
Dissolved Metals	Dissolved Metals Filtration Location	FIELD	FIELD	FIELD	FIELD	FIELD
	Aluminum (Al)-Dissolved (mg/L)	0.0010	0.0011	0.0027	0.0040	0.0056
	Antimony (Sb)-Dissolved (mg/L)	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
	Arsenic (As)-Dissolved (mg/L)	0.00020	0.00015	0.00026	0.00030	0.00036
	Barium (Ba)-Dissolved (mg/L)	0.0631	0.0661	0.0660	0.0667	0.0660
	Beryllium (Be)-Dissolved (mg/L)	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
	Bismuth (Bi)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Boron (B)-Dissolved (mg/L)	<0.010	<0.010	<0.010	<0.010	<0.010
	Cadmium (Cd)-Dissolved (mg/L)	0.000161	0.000155	0.000211	0.000337	0.000607
	Calcium (Ca)-Dissolved (mg/L)	82.2	42.1	40.3	39.2	38.6
	Chromium (Cr)-Dissolved (mg/L)	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
	Cobalt (Co)-Dissolved (mg/L)	0.00228	0.00080	0.00123	0.00210	0.00393
	Copper (Cu)-Dissolved (mg/L)	0.00031	0.00033	0.00038	0.00030	0.00030
	Iron (Fe)-Dissolved (mg/L)	0.319	0.051	0.117	0.075	0.110
	Lead (Pb)-Dissolved (mg/L)	<0.000050	<0.000050	<0.000050	<0.000050	0.000056
	Lithium (Li)-Dissolved (mg/L)	0.00647	0.00554	0.00573	0.00649	0.00659
	Magnesium (Mg)-Dissolved (mg/L)	18.0	9.93	9.31	9.84	10.0
	Manganese (Mn)-Dissolved (mg/L)	2.60	0.107	0.125	0.149	0.197
	Molybdenum (Mo)-Dissolved (mg/L)	0.000611	0.000592	0.000593	0.000716	0.000710
	Nickel (Ni)-Dissolved (mg/L)	0.00545	0.00234	0.00260	0.00359	0.00598
	Phosphorus (P)-Dissolved (mg/L)	<0.30	<0.30	<0.30	<0.30	<0.30
	Potassium (K)-Dissolved (mg/L)	1.50	1.01	1.02	0.931	0.910

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Sample ID Description Sampled Date Sampled Time Client ID		L1407318-6 SURFACE WATE 27-DEC-13 13:11 NF2A	L1407318-7 SURFACE WATE 27-DEC-13 13:15 NF2B	L1407318-8 SURFACE WATE 27-DEC-13 15:02 R10	L1407318-9 SURFACE WATE 27-DEC-13 15:13 R09	L1407318-10 SURFACE WATE 27-DEC-13 15:25 R08
Grouping	Analyte					
WATER						
Total Metals	Nickel (Ni)-Total (mg/L)	0.0197	<0.00050	<0.00050	<0.00050	<0.00050
	Phosphorus (P)-Total (mg/L)	<0.30	<0.30	<0.30	<0.30	<0.30
	Potassium (K)-Total (mg/L)	0.995	0.924	0.939	0.897	0.754
	Selenium (Se)-Total (mg/L)	0.00042	0.00041	0.00042	0.00042	0.00037
	Silicon (Si)-Total (mg/L)	5.97	6.12	6.11	5.96	5.64
	Silver (Ag)-Total (mg/L)	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
	Sodium (Na)-Total (mg/L)	3.10	2.88	2.93	2.77	2.51
	Strontium (Sr)-Total (mg/L)	0.184	0.174	0.170	0.170	0.136
	Thallium (Tl)-Total (mg/L)	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
	Tin (Sn)-Total (mg/L)	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
	Titanium (Ti)-Total (mg/L)	<0.010	<0.010	<0.010	<0.010	<0.010
	Uranium (U)-Total (mg/L)	0.00222	0.00216	0.00224	0.00215	0.00167
	Vanadium (V)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Zinc (Zn)-Total (mg/L)	2.97	0.0136	0.0091	<0.0030	<0.0030
	Zirconium (Zr)-Total (mg/L)	<0.00080	<0.00080	<0.00080	<0.00080	<0.00080
Dissolved Metals	Dissolved Metals Filtration Location	FIELD	FIELD	FIELD	FIELD	FIELD
	Aluminum (Al)-Dissolved (mg/L)	0.0130	0.0018	0.0026	0.0018	0.0014
	Antimony (Sb)-Dissolved (mg/L)	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
	Arsenic (As)-Dissolved (mg/L)	0.00030	0.00044	0.00043	0.00042	0.00044
	Barium (Ba)-Dissolved (mg/L)	0.0692	0.0678	0.0662	0.0646	0.0579
	Beryllium (Be)-Dissolved (mg/L)	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
	Bismuth (Bi)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Boron (B)-Dissolved (mg/L)	<0.010	<0.010	<0.010	<0.010	<0.010
	Cadmium (Cd)-Dissolved (mg/L)	0.00215	0.000015	0.000015	<0.000010	<0.000010
	Calcium (Ca)-Dissolved (mg/L)	41.8	39.8	39.5	40.0	33.7
	Chromium (Cr)-Dissolved (mg/L)	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
	Cobalt (Co)-Dissolved (mg/L)	0.0136	<0.00010	<0.00010	<0.00010	<0.00010
	Copper (Cu)-Dissolved (mg/L)	0.00057	0.00032	0.00032	0.00024	0.00022
	Iron (Fe)-Dissolved (mg/L)	0.275	0.050	0.044	0.036	0.055
	Lead (Pb)-Dissolved (mg/L)	0.000125	<0.000050	<0.000050	<0.000050	<0.000050
	Lithium (Li)-Dissolved (mg/L)	0.00792	0.00643	0.00634	0.00644	0.00587
	Magnesium (Mg)-Dissolved (mg/L)	15.3	8.64	8.20	8.43	6.20
	Manganese (Mn)-Dissolved (mg/L)	0.614	0.0206	0.0252	0.0234	0.0213
	Molybdenum (Mo)-Dissolved (mg/L)	0.000728	0.000718	0.000735	0.000734	0.000687
	Nickel (Ni)-Dissolved (mg/L)	0.0199	<0.00050	<0.00050	<0.00050	<0.00050
	Phosphorus (P)-Dissolved (mg/L)	<0.30	<0.30	<0.30	<0.30	<0.30
	Potassium (K)-Dissolved (mg/L)	1.09	0.959	0.912	0.916	0.758

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ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample ID Description Sampled Date Sampled Time Client ID	L1407318-11 SURFACE WATE 27-DEC-13 11:20 X3A-R	L1407318-12 SURFACE WATE 27-DEC-13 FARO 27-DEC13-F (FIELD BLANK)	L1407318-13 SURFACE WATE 27-DEC-13 TRAVEL BLANK		
Grouping	Analyte				
WATER					
Total Metals	Nickel (Ni)-Total (mg/L)	0.00227	<0.00050	<0.00050	
	Phosphorus (P)-Total (mg/L)	<0.30	<0.30	<0.30	
	Potassium (K)-Total (mg/L)	1.01	<0.050	<0.050	
	Selenium (Se)-Total (mg/L)	0.00030	<0.00010	<0.00010	
	Silicon (Si)-Total (mg/L)	5.10	<0.050	<0.050	
	Silver (Ag)-Total (mg/L)	<0.000010	<0.000010	<0.000010	
	Sodium (Na)-Total (mg/L)	2.66	<0.050	<0.050	
	Strontium (Sr)-Total (mg/L)	0.173	<0.00020	<0.00020	
	Thallium (Tl)-Total (mg/L)	<0.000010	<0.000010	<0.000010	
	Tin (Sn)-Total (mg/L)	<0.00010	<0.00010	<0.00010	
	Titanium (Ti)-Total (mg/L)	<0.010	<0.010	<0.010	
	Uranium (U)-Total (mg/L)	0.00214	<0.000010	<0.000010	
	Vanadium (V)-Total (mg/L)	<0.0010	<0.0010	<0.0010	
	Zinc (Zn)-Total (mg/L)	0.301	<0.0030	<0.0030	
	Zirconium (Zr)-Total (mg/L)	<0.00080	<0.00080	<0.00080	
Dissolved Metals	Dissolved Metals Filtration Location	FIELD	FIELD		
	Aluminum (Al)-Dissolved (mg/L)	0.0024	<0.0010		
	Antimony (Sb)-Dissolved (mg/L)	<0.00010	<0.00010		
	Arsenic (As)-Dissolved (mg/L)	0.00023	<0.00010		
	Barium (Ba)-Dissolved (mg/L)	0.0588	<0.000050		
	Beryllium (Be)-Dissolved (mg/L)	<0.00010	<0.00010		
	Bismuth (Bi)-Dissolved (mg/L)	<0.00050	<0.00050		
	Boron (B)-Dissolved (mg/L)	<0.010	<0.010		
	Cadmium (Cd)-Dissolved (mg/L)	0.000196	<0.000010		
	Calcium (Ca)-Dissolved (mg/L)	39.0	<0.020		
	Chromium (Cr)-Dissolved (mg/L)	<0.00010	<0.00010		
	Cobalt (Co)-Dissolved (mg/L)	0.00121	<0.00010		
	Copper (Cu)-Dissolved (mg/L)	0.00027	<0.00020		
	Iron (Fe)-Dissolved (mg/L)	0.108	<0.010		
	Lead (Pb)-Dissolved (mg/L)	<0.000050	<0.000050		
	Lithium (Li)-Dissolved (mg/L)	0.00524	<0.00050		
	Magnesium (Mg)-Dissolved (mg/L)	9.34	<0.0050		
	Manganese (Mn)-Dissolved (mg/L)	0.123	<0.000050		
	Molybdenum (Mo)-Dissolved (mg/L)	0.000510	<0.000050		
	Nickel (Ni)-Dissolved (mg/L)	0.00243	<0.00050		
	Phosphorus (P)-Dissolved (mg/L)	<0.30	<0.30		
	Potassium (K)-Dissolved (mg/L)	1.02	<0.050		

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

	Sample ID	L1407318-1	L1407318-2	L1407318-3	L1407318-4	L1407318-5
Description		SURFACE WATE	SURFACE WATE	SURFACE WATE	SURFACE WATE	SURFACE WATE
Sampled Date		27-DEC-13	27-DEC-13	27-DEC-13	27-DEC-13	27-DEC-13
Sampled Time		09:43	10:17	11:00	12:10	13:00
Client ID		X14	X10	X3A	X2	NF2
Grouping	Analyte					
WATER						
Dissolved Metals	Selenium (Se)-Dissolved (mg/L)	0.00039	0.00037	0.00037	0.00043	0.00038
	Silicon (Si)-Dissolved (mg/L)	5.57	5.36	5.46	6.07	6.05
	Silver (Ag)-Dissolved (mg/L)	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
	Sodium (Na)-Dissolved (mg/L)	5.22	2.70	2.77	2.91	2.84
	Strontium (Sr)-Dissolved (mg/L)	0.289	0.190	0.185	0.176	0.163
	Thallium (Tl)-Dissolved (mg/L)	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
	Tin (Sn)-Dissolved (mg/L)	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
	Titanium (Ti)-Dissolved (mg/L)	<0.010	<0.010	<0.010	<0.010	<0.010
	Uranium (U)-Dissolved (mg/L)	0.00272	0.00224	0.00230	0.00212	0.00205
	Vanadium (V)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Zinc (Zn)-Dissolved (mg/L)	0.248	0.292	0.341	0.497	0.905
	Zirconium (Zr)-Dissolved (mg/L)	<0.00080	<0.00080	<0.00080	<0.00080	<0.00080

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

		Sample ID Description Sampled Date Sampled Time Client ID	L1407318-6 SURFACE WATE 27-DEC-13 13:11 NF2A	L1407318-7 SURFACE WATE 27-DEC-13 13:15 NF2B	L1407318-8 SURFACE WATE 27-DEC-13 15:02 R10	L1407318-9 SURFACE WATE 27-DEC-13 15:13 R09	L1407318-10 SURFACE WATE 27-DEC-13 15:25 R08
Grouping	Analyte						
WATER							
Dissolved Metals	Selenium (Se)-Dissolved (mg/L)	0.00046	0.00045	0.00042	0.00040	0.00038	
	Silicon (Si)-Dissolved (mg/L)	6.47	6.43	6.33	6.09	5.60	
	Silver (Ag)-Dissolved (mg/L)	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	
	Sodium (Na)-Dissolved (mg/L)	3.27	3.00	2.83	2.81	2.49	
	Strontium (Sr)-Dissolved (mg/L)	0.182	0.167	0.161	0.162	0.135	
	Thallium (Tl)-Dissolved (mg/L)	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	
	Tin (Sn)-Dissolved (mg/L)	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	
	Titanium (Ti)-Dissolved (mg/L)	<0.010	<0.010	<0.010	<0.010	<0.010	
	Uranium (U)-Dissolved (mg/L)	0.00218	0.00211	0.00206	0.00205	0.00166	
	Vanadium (V)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	
	Zinc (Zn)-Dissolved (mg/L)	3.28	0.0128	0.0093	<0.0010	<0.0010	
	Zirconium (Zr)-Dissolved (mg/L)	<0.00080	<0.00080	<0.00080	<0.00080	<0.00080	

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample ID Description Sampled Date Sampled Time Client ID	L1407318-11 SURFACE WATE 27-DEC-13 11:20 X3A-R	L1407318-12 SURFACE WATE 27-DEC-13 FARO 27-DEC13-F (FIELD BLANK)	L1407318-13 SURFACE WATE 27-DEC-13 TRAVEL BLANK		
Grouping	Analyte				
WATER					
Dissolved Metals	Selenium (Se)-Dissolved (mg/L)	0.00032	<0.00010		
	Silicon (Si)-Dissolved (mg/L)	5.22	<0.050		
	Silver (Ag)-Dissolved (mg/L)	<0.000010	<0.000010		
	Sodium (Na)-Dissolved (mg/L)	2.73	<0.050		
	Strontium (Sr)-Dissolved (mg/L)	0.168	<0.00020		
	Thallium (Tl)-Dissolved (mg/L)	<0.000010	<0.000010		
	Tin (Sn)-Dissolved (mg/L)	<0.00010	<0.00010		
	Titanium (Ti)-Dissolved (mg/L)	<0.010	<0.010		
	Uranium (U)-Dissolved (mg/L)	0.00199	<0.000010		
	Vanadium (V)-Dissolved (mg/L)	<0.0010	<0.0010		
	Zinc (Zn)-Dissolved (mg/L)	0.339	<0.0010		
	Zirconium (Zr)-Dissolved (mg/L)	<0.00080	<0.00080		

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

Reference Information

QC Samples with Qualifiers & Comments:

QC Type Description	Parameter	Qualifier	Applies to Sample Number(s)
Matrix Spike	Ammonia, Total (as N)	MS-B	L1407318-1, -10, -11, -12, -2, -3, -4, -5, -6, -7, -8, -9

Qualifiers for Individual Parameters Listed:

Qualifier	Description
MS-B	Matrix Spike recovery could not be accurately calculated due to high analyte background in sample.
RRV	Reported Result Verified By Repeat Analysis
SFP	Sample was Filtered and Preserved at the laboratory

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
ALK-COL-VA	Water	Alkalinity by Colourimetric (Automated)	EPA 310.2
This analysis is carried out using procedures adapted from EPA Method 310.2 "Alkalinity". Total Alkalinity is determined using the methyl orange colourimetric method.			
ANIONS-CL-IC-VA	Water	Chloride by Ion Chromatography	APHA 4110 B.
This analysis is carried out using procedures adapted from APHA Method 4110 B. "Ion Chromatography with Chemical Suppression of Eluent Conductivity" and EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography".			
ANIONS-F-IC-VA	Water	Fluoride by Ion Chromatography	APHA 4110 B.
This analysis is carried out using procedures adapted from APHA Method 4110 B. "Ion Chromatography with Chemical Suppression of Eluent Conductivity" and EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography".			
ANIONS-NO2-IC-VA	Water	Nitrite in Water by Ion Chromatography	EPA 300.0
This analysis is carried out using procedures adapted from EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography". Nitrite is detected by UV absorbance.			
ANIONS-NO3-IC-VA	Water	Nitrate in Water by Ion Chromatography	EPA 300.0
This analysis is carried out using procedures adapted from EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography". Nitrate is detected by UV absorbance.			
ANIONS-SO4-IC-VA	Water	Sulfate by Ion Chromatography	APHA 4110 B.
This analysis is carried out using procedures adapted from APHA Method 4110 B. "Ion Chromatography with Chemical Suppression of Eluent Conductivity" and EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography".			
CARBONS-DOC-VA	Water	Dissolved organic carbon by combustion	APHA 5310 TOTAL ORGANIC CARBON (TOC)
This analysis is carried out using procedures adapted from APHA Method 5310 "Total Organic Carbon (TOC)". Dissolved carbon (DOC) fractions are determined by filtering the sample through a 0.45 micron membrane filter prior to analysis.			
CARBONS-TOC-VA	Water	Total organic carbon by combustion	APHA 5310 TOTAL ORGANIC CARBON (TOC)
This analysis is carried out using procedures adapted from APHA Method 5310 "Total Organic Carbon (TOC)".			
EC-PCT-VA	Water	Conductivity (Automated)	APHA 2510 Auto. Conduc.
This analysis is carried out using procedures adapted from APHA Method 2510 "Conductivity". Conductivity is determined using a conductivity electrode.			
HARDNESS-CALC-VA	Water	Hardness	APHA 2340B
Hardness (also known as Total Hardness) is calculated from the sum of Calcium and Magnesium concentrations, expressed in CaCO3 equivalents. Dissolved Calcium and Magnesium concentrations are preferentially used for the hardness calculation.			
IONBALANCE-VA	Water	Ion Balance Calculation	APHA 1030E
Cation Sum, Anion Sum, and Ion Balance (as % difference) are calculated based on guidance from APHA Standard Methods (1030E Checking Correctness of Analysis). Because all aqueous solutions are electrically neutral, the calculated ion balance (% difference of cations minus anions) should be near-zero.			
Cation and Anion Sums are the total meq/L concentration of major cations and anions. Dissolved species are used where available. Minor ions are included where data is present. Ion Balance is calculated as:			
$\text{Ion Balance (\%)} = \frac{[\text{Cation Sum} - \text{Anion Sum}]}{[\text{Cation Sum} + \text{Anion Sum}]}$			
MET-D-CCMS-VA	Water	Dissolved Metals in Water by CRC ICPMS	APHA 3030 B&E / EPA SW-846 6020A
This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedures may involve preliminary sample treatment by acid digestion, using hotblock, or filtration (APHA 3030B&E). Instrumental analysis is by collision cell inductively coupled plasma - mass spectrometry (modified from EPA Method 6020A).			
MET-T-CCMS-VA	Water	Total Metals in Water by CRC ICPMS	APHA 3030 B&E / EPA SW-846 6020A
This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the			

Reference Information

American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedures may involve preliminary sample treatment by acid digestion, using hotblock, or filtration (APHA 3030B&E). Instrumental analysis is by collision cell inductively coupled plasma - mass spectrometry (modified from EPA Method 6020A).

NH3-F-VA Water Ammonia in Water by Fluorescence J. ENVIRON. MONIT., 2005, 7, 37-42, RSC

This analysis is carried out, on sulfuric acid preserved samples, using procedures modified from J. Environ. Monit., 2005, 7, 37 - 42, The Royal Society of Chemistry, "Flow-injection analysis with fluorescence detection for the determination of trace levels of ammonium in seawater", Roslyn J. Waston et al.

P-T-COL-VA Water Total P in Water by Colour APHA 4500-P Phosphorous

This analysis is carried out using procedures adapted from APHA Method 4500-P "Phosphorus". Total Phosphorous is determined colourimetrically after persulphate digestion of the sample.

PH-PCT-VA Water pH by Meter (Automated) APHA 4500-H "pH Value"

This analysis is carried out using procedures adapted from APHA Method 4500-H "pH Value". The pH is determined in the laboratory using a pH electrode

It is recommended that this analysis be conducted in the field.

PH-PCT-VA Water pH by Meter (Automated) APHA 4500-H pH Value

This analysis is carried out using procedures adapted from APHA Method 4500-H "pH Value". The pH is determined in the laboratory using a pH electrode

It is recommended that this analysis be conducted in the field.

TDS-CALC-VA Water TDS (Calculated) APHA 1030E (20TH EDITION)

This analysis is carried out using procedures adapted from APHA 1030E "Checking Correctness of Analyses".

TSS-LOW-VA Water Total Suspended Solids by Grav. (1 mg/L) APHA 2540 Gravimetric

This analysis is carried out using procedures adapted from APHA Method 2540 "Solids". Solids are determined gravimetrically. Total suspended solids (TSS) are determined by filtering a sample through a glass fibre filter, TSS is determined by drying the filter at 104 degrees celsius.

ZR-D-MS-VA Water Dissolved Zr in Water by ICPMS EPA SW-846 3005A/6020A

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedures may involve preliminary sample treatment by acid digestion, using either hotblock or microwave oven, or filtration (EPA Method 3005A). Instrumental analysis is by inductively coupled plasma - mass spectrometry (EPA Method 6020A).

ZR-T-MS-VA Water Total Zr in Water by ICPMS EPA SW-846 3005A/6020A

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedures may involve preliminary sample treatment by acid digestion, using either hotblock or microwave oven, or filtration (EPA Method 3005A). Instrumental analysis is by inductively coupled plasma - mass spectrometry (EPA Method 6020A).

** ALS test methods may incorporate modifications from specified reference methods to improve performance.

The last two letters of the above test code(s) indicate the laboratory that performed analytical analysis for that test. Refer to the list below:

Laboratory Definition Code	Laboratory Location
VA	ALS ENVIRONMENTAL - VANCOUVER, BRITISH COLUMBIA, CANADA

Chain of Custody Numbers:

1 2

Reference Information

GLOSSARY OF REPORT TERMS

Surrogate - A compound that is similar in behaviour to target analyte(s), but that does not occur naturally in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery.

mg/kg - milligrams per kilogram based on dry weight of sample.

mg/kg wwt - milligrams per kilogram based on wet weight of sample.

mg/kg lwt - milligrams per kilogram based on lipid-adjusted weight of sample.

mg/L - milligrams per litre.

< - Less than.

D.L. - The reported Detection Limit, also known as the Limit of Reporting (LOR).

N/A - Result not available. Refer to qualifier code and definition for explanation.

Test results reported relate only to the samples as received by the laboratory.

UNLESS OTHERWISE STATED, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.

Analytical results in unsigned test reports with the DRAFT watermark are subject to change, pending final QC review.



Short Holding Time



L1407318-COFC

3rm

COC #

Rush Processing

Report To	Company: EDI			<input checked="" type="checkbox"/> Standard <input type="checkbox"/> Other			Service Requested (Rush for routine analysis subject to availability)					
Contact:	Meighan Kearns			<input checked="" type="checkbox"/> PDF <input checked="" type="checkbox"/> Excel <input type="checkbox"/> Digital <input type="checkbox"/> Fax			<input type="checkbox"/> Regular (Standard Turnaround Times - Business Days)					
Address:	2195 - 2nd Avenue Whitehorse, YT Y1A 3T8			Email 1: mkearns@edynamics.com			<input checked="" type="checkbox"/> Priority (2-4 Business Days) - 50% Surcharge - Contact ALS to Confirm TAT					
Phone:	867-393-4882 Fax:			Email 2: Adrienne.Turcotte@gov.yk.ca			<input checked="" type="checkbox"/> Emergency (1-2 Bus. Days) - 100% Surcharge - Contact ALS to Confirm TAT					
Invoice To	Same as Report? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No			Email 3: Patricia.Randell@gov.yk.ca			<input type="checkbox"/> Same Day or Weekend Emergency - Contact ALS to Confirm TAT					

Hardcopy of Invoice with Report?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No			Client / Project Information						Analysis Request					
Company:				Job #: 13-Y-0452						Please indicate below Filtered, Preserved or both (F, P, F/P)					
Contact:				PO / AFE:						ALK-COL-VA, P-T-COL-VA					
Address:				LSD:						ANIONS-ALL-IC-WR					
Phone:				Quote #: Q38556						CARBONS-DOC-VA					

Lab Work Order #	L1407318			ALS Contact:			Sampler:					
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Sample #	Sample Identification (This description will appear on)	Date (dd-mmm-yy)	Time (hh:mm)	Sample Type	ALK-COL-VA, P-T-COL-VA	ANIONS-ALL-IC-WR	CARBONS-DOC-VA	CARBONS-TOC-VA, NH3-F-V	EC-MAN-WR, PH-MAN-WR	MET-D-CCMS-VA, ZR-D-MS-	MET-T-CCMS-VA, ZR-T-MS-	IONBALANCE-VA	TDS-CALC-VA	TSS-LOW-WR	HARDNESS-CALC-VA	Number of Containers
	X14	27 DEC 13	0943	Surface Water	X	X	X	X	X	X	X	X	X	X	X	5
	X10	27 DEC 13	1017													
	X3A		1100													
	X2		1210													
	NF2		1300													
	NF2A		1311													
	NF2B		1315													
	R10		1502													
	R09		1513													
	R08		1525													
	X3A-P		1120													
	FARO 27-DEC13-F (FIELD BLANK)															

RUSH

Priority processing

Special Instructions / Regulations with water or land use (CCME-Freshwater Aquatic Life/BC CSR - Commercial/AB Tier 1 - Natural, etc) / Hazardous Details

Use Faro Equis Format to report

Failure to complete all portions of this form may delay analysis. Please fill in this form LEGIBLY.

By the use of this form the user acknowledges and agrees with the Terms and Conditions as provided on a separate Excel tab.

Also provided on another Excel tab are the ALS location addresses, phone numbers and sample container / preservation / holding time table for common analyses.

SHIPMENT RELEASE (client use)			SHIPMENT RECEPTION (lab use only)			SHIPMENT VERIFICATION (lab use only)			Observations: Yes / No ? If Yes add SIF	
Released by:	Date (dd-mmm-yy)	Time (hh-mm)	Received by:	Date:	Time:	Temperature:	Verified by:	Date:		Time:
<i>[Signature]</i>	28 DEC 13	1400	<i>[Signature]</i>	Dec 30	8:50	-1°C °C				



L1407318-COFC

Report To	Report Format / Distribution	Service Requested (Rush for routine analysis subject to availability)
Company: EDI	<input checked="" type="checkbox"/> Standard <input type="checkbox"/> Other	<input type="radio"/> Regular (Standard Turnaround Times - Business Days)
Contact: Meighan Kearns	<input checked="" type="checkbox"/> PDF <input checked="" type="checkbox"/> Excel <input type="checkbox"/> Digital <input type="checkbox"/> Fax	<input checked="" type="radio"/> Priority (2-4 Business Days) - 50% Surcharge - Contact ALS to Confirm TAT
Address: 2195 - 2nd Avenue Whitehorse, YT Y1A 3T8	Email 1: mkearns@edynamics.com	<input checked="" type="radio"/> Emergency (1-2 Bus. Days) - 100% Surcharge - Contact ALS to Confirm TAT
Phone: 867-393-4882 Fax:	Email 2: Adrienne.Turcotte@gov.yk.ca	<input type="radio"/> Same Day or Weekend Emergency - Contact ALS to Confirm TAT
	Email 3: Patricia.Randell@gov.yk.ca	

Invoice To Same as Report? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Client / Project Information	Analysis Request											
Hardcopy of Invoice with Report? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Job #: 13-Y-0452	Please indicate below Filtered, Preserved or both (F, P, F/P)											
Company:	PO / AFE:	ALK-COL-VA,P-T-COL-VA	ANIONS-ALL-IC-WR	CARBONS-DOC-VA	CARBONS-TOC-VA,NH3-F-V	EC-MAN-WR,PH-MAN-WR	MET-D-CCMS-VA,ZR-D-MS-	MET-T-CCMS-VA,ZR-T-MS-	IONBALANCE-VA	TDS-CALC-VA	TSS-LOW-WR	HARDNESS-CALC-VA	Number of Containers
Contact:	LSD:												
Address:	Quote #: Q38556												
Phone: Fax:	ALS Contact:												
Lab Work Order # (lab use only)	Sampler:												

Sample #	Sample Identification (This description will appear on the report)	Date (dd-mmm-yy)	Time (hh:mm)	Sample Type	ALK-COL-VA,P-T-COL-VA	ANIONS-ALL-IC-WR	CARBONS-DOC-VA	CARBONS-TOC-VA,NH3-F-V	EC-MAN-WR,PH-MAN-WR	MET-D-CCMS-VA,ZR-D-MS-	MET-T-CCMS-VA,ZR-T-MS-	IONBALANCE-VA	TDS-CALC-VA	TSS-LOW-WR	HARDNESS-CALC-VA	Number of Containers
	TRACEL BLANK			Surface Water	X	X	X	X	X	X	X	X	X	X	X	5

Priority processing

RUSH

Short Holding Time

Rush Processing

Special Instructions / Regulations with water or land use (CCME-Freshwater Aquatic Life/BC CSR - Commercial/AB Tier 1 - Natural, etc) / Hazardous Details

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SHIPMENT RELEASE (client use)			SHIPMENT RECEPTION (lab use only)			SHIPMENT VERIFICATION (lab use only)			Observations: Yes / No ? If Yes add SIF
Released by:	Date (dd-mmm-yy)	Time (hh-mm)	Received by:	Date:	Time:	Temperature:	Verified by:	Date:	Time:
<i>[Signature]</i>	28 Dec 13	1400	<i>[Signature]</i>	Dec 30	8:50	-1°C °C			