

## CERTIFICATE OF ANALYSIS

Work Order	: VA23C0167	Page	: 1 of 10
Client	: Northwest Research and Monitoring Ltd.	Laboratory	: ALS Environmental - Vancouver
Contact	: Laura Guillon	Account Manager	: Sneha Sansare
Address	: PO Box 4357 Smithers BC Canada V0J 2N0	Address	: 8081 Lougheed Highway Burnaby BC Canada V5A 1W9
Telephone	: ----	Telephone	: +1 604 253 4188
Project	: MWMT 2023-MORICE LAKE	Date Samples Received	: 28-Aug-2023 10:05
PO	: ----	Date Analysis Commenced	: 30-Aug-2023
C-O-C number	: 20-1014750	Issue Date	: 06-Sep-2023 11:09
Sampler	: ----		
Site	: ----		
Quote number	: Q72918		
No. of samples received	: 8		
No. of samples analysed	: 8		

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QC Interpretive report to assist with Quality Review and Sample Receipt Notification (SRN).

### Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is conducted in accordance with US FDA 21 CFR Part 11.

Signatories	Position	Laboratory Department
Anshim Anshim	Lab Assistant	Metals, Burnaby, British Columbia
Erin Sanchez		Metals, Burnaby, British Columbia
Kevin Duarte	Supervisor - Metals ICP Instrumentation	Metals, Burnaby, British Columbia
Lindsay Gung	Supervisor - Water Chemistry	Inorganics, Burnaby, British Columbia
Robin Weeks	Team Leader - Metals	Inorganics, Burnaby, British Columbia
Tracy Harley	Supervisor - Water Quality Instrumentation	Inorganics, Burnaby, British Columbia



## General Comments

The analytical methods used by ALS are developed using internationally recognized reference methods (where available), such as those published by US EPA, APHA Standard Methods, ASTM, ISO, Environment Canada, BC MOE, and Ontario MOE. Refer to the ALS Quality Control Interpretive report (QCI) for applicable references and methodology summaries. Reference methods may incorporate modifications to improve performance.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

Please refer to Quality Control Interpretive report (QCI) for information regarding Holding Time compliance.

Key : CAS Number: Chemical Abstracts Services number is a unique identifier assigned to discrete substances  
LOR: Limit of Reporting (detection limit).

Unit	Description
-	no units
µg/sample	micrograms per sample
mg/L	milligrams per litre

<: less than.

>: greater than.

Surrogate: An analyte that is similar in behavior 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.

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

UNLESS OTHERWISE STATED on SRN or QCI Report, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.

## Qualifiers

Qualifier	Description
RRV	Reported result verified by repeat analysis.
SFP	Sample was filtered and preserved at the laboratory.



Analytical Results

Sub-Matrix: Water (Matrix: Water)				Client sample ID	MOR 1D	MOR 2D	MOR 3D	MOR 1S	MOR 2S
Client sampling date / time					28-Aug-2023 09:10	28-Aug-2023 07:30	28-Aug-2023 06:15	28-Aug-2023 09:10	28-Aug-2023 07:30
Analyte	CAS Number	Method/Lab	LOR	Unit	VA23C0167-001	VA23C0167-002	VA23C0167-003	VA23C0167-004	VA23C0167-005
					Result	Result	Result	Result	Result
Physical Tests									
Alkalinity, total (as CaCO3)	----	E290/VA	1.0	mg/L	16.1	16.0	16.1	16.1	16.0
Solids, total dissolved [TDS]	----	E162/VA	10	mg/L	29	28	24	30	27
Anions and Nutrients									
Ammonia, total (as N)	7664-41-7	E298/VA	0.0050	mg/L	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Nitrate (as N)	14797-55-8	E235.NO3-L/V A	0.0050	mg/L	0.0390	0.0376	0.0340	0.0122	0.0136
Nitrate + Nitrite (as N)	----	EC235.N+N/V A	0.0050	mg/L	0.0390	0.0376	0.0340	0.0122	0.0136
Nitrite (as N)	14797-65-0	E235.NO2-L/V A	0.0010	mg/L	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Nitrogen, total	7727-37-9	E366/VA	0.030	mg/L	0.060	0.056	0.056	0.050	0.042
Nitrogen, total dissolved	----	E368/VA	0.030	mg/L	<0.030	<0.030	<0.030	<0.030	<0.030
Phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U/VA	0.0010	mg/L	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Phosphorus, total	7723-14-0	E372-U/VA	0.0020	mg/L	0.0021	0.0021	0.0026	<0.0020	<0.0020
Phosphorus, total dissolved	7723-14-0	E375-T/VA	0.0020	mg/L	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020
Silicate (as SiO2)	7631-86-9	E392/VA	0.50	mg/L	2.93	2.88	2.83	2.78	2.80
Organic / Inorganic Carbon									
Carbon, dissolved organic [DOC]	----	E358-L/VA	0.50	mg/L	1.64	1.17	1.35	1.22	1.36
Total Metals									
Aluminum, total	7429-90-5	E420/VA	0.0030	mg/L	0.0146	0.0272	0.0301	0.0204	0.0270
Antimony, total	7440-36-0	E420/VA	0.00010	mg/L	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Arsenic, total	7440-38-2	E420/VA	0.00010	mg/L	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Barium, total	7440-39-3	E420/VA	0.00010	mg/L	0.0157	0.0158	0.0154	0.0156	0.0169
Beryllium, total	7440-41-7	E420/VA	0.000020	mg/L	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020
Bismuth, total	7440-69-9	E420/VA	0.000050	mg/L	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050
Boron, total	7440-42-8	E420/VA	0.010	mg/L	<0.010	<0.010	<0.010	<0.010	<0.010
Cadmium, total	7440-43-9	E420/VA	0.0000050	mg/L	0.0000060	<0.0000050	0.0000053	<0.0000050	0.0000060
Calcium, total	7440-70-2	E420/VA	0.050	mg/L	6.48	6.54	6.42	6.37	6.68
Cesium, total	7440-46-2	E420/VA	0.000010	mg/L	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
Chromium, total	7440-47-3	E420/VA	0.00050	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050



Analytical Results

Sub-Matrix: Water					Client sample ID	MOR 1D	MOR 2D	MOR 3D	MOR 1S	MOR 2S
(Matrix: Water)										
Client sampling date / time										
Analyte	CAS Number	Method/Lab	LOR	Unit	VA23C0167-001	VA23C0167-002	VA23C0167-003	VA23C0167-004	VA23C0167-005	
					Result	Result	Result	Result	Result	
Total Metals										
Cobalt, total	7440-48-4	E420/VA	0.00010	mg/L	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Copper, total	7440-50-8	E420/VA	0.00050	mg/L	<0.00050	0.00058	0.00050	0.00057	0.00063	
Iron, total	7439-89-6	E420/VA	0.010	mg/L	0.011	0.022	0.023	0.016	0.021	
Lead, total	7439-92-1	E420/VA	0.000050	mg/L	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	
Lithium, total	7439-93-2	E420/VA	0.0010	mg/L	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	
Magnesium, total	7439-95-4	E420/VA	0.0050	mg/L	0.537	0.533	0.523	0.527	0.550	
Manganese, total	7439-96-5	E420/VA	0.00010	mg/L	0.00080	0.00114	0.00101	0.00099	0.00117	
Molybdenum, total	7439-98-7	E420/VA	0.000050	mg/L	0.000419	0.000435	0.000418	0.000426	0.000432	
Nickel, total	7440-02-0	E420/VA	0.00050	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	
Phosphorus, total	7723-14-0	E420/VA	0.050	mg/L	<0.050	<0.050	<0.050	<0.050	<0.050	
Potassium, total	7440-09-7	E420/VA	0.050	mg/L	0.286	0.292	0.288	0.272	0.298	
Rubidium, total	7440-17-7	E420/VA	0.00020	mg/L	0.00037	0.00038	0.00037	0.00037	0.00038	
Selenium, total	7782-49-2	E420/VA	0.000050	mg/L	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	
Silicon, total	7440-21-3	E420/VA	0.10	mg/L	1.47	1.42	1.44	1.34	1.41	
Silver, total	7440-22-4	E420/VA	0.000010	mg/L	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	
Sodium, total	7440-23-5	E420/VA	0.050	mg/L	0.650	0.643	0.633	0.620	0.650	
Strontium, total	7440-24-6	E420/VA	0.00020	mg/L	0.0280	0.0289	0.0270	0.0280	0.0291	
Sulfur, total	7704-34-9	E420/VA	0.50	mg/L	1.06	1.08	1.08	1.11	1.20	
Tellurium, total	13494-80-9	E420/VA	0.00020	mg/L	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	
Thallium, total	7440-28-0	E420/VA	0.000010	mg/L	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	
Thorium, total	7440-29-1	E420/VA	0.00010	mg/L	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	
Tin, total	7440-31-5	E420/VA	0.00010	mg/L	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	
Titanium, total	7440-32-6	E420/VA	0.00030	mg/L	<0.00030	0.00069	0.00091	0.00038	0.00058	
Tungsten, total	7440-33-7	E420/VA	0.00010	mg/L	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	
Uranium, total	7440-61-1	E420/VA	0.000010	mg/L	0.000026	0.000032	0.000026	0.000026	0.000028	
Vanadium, total	7440-62-2	E420/VA	0.00050	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	
Zinc, total	7440-66-6	E420/VA	0.0030	mg/L	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	
Zirconium, total	7440-67-7	E420/VA	0.00020	mg/L	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	
Dissolved Metals										
Aluminum, dissolved	7429-90-5	E421/VA	0.0010	mg/L	0.0058	0.0083	0.0065	0.0079	0.0118	



Analytical Results

Sub-Matrix: Water					Client sample ID	MOR 1D	MOR 2D	MOR 3D	MOR 1S	MOR 2S
(Matrix: Water)										
Client sampling date / time										
Analyte	CAS Number	Method/Lab	LOR	Unit	VA23C0167-001	VA23C0167-002	VA23C0167-003	VA23C0167-004	VA23C0167-005	
					Result	Result	Result	Result	Result	
Dissolved Metals										
Antimony, dissolved	7440-36-0	E421/VA	0.00010	mg/L	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Arsenic, dissolved	7440-38-2	E421/VA	0.00010	mg/L	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Barium, dissolved	7440-39-3	E421/VA	0.00010	mg/L	0.0153	0.0149	0.0151	0.0154	0.0152	
Beryllium, dissolved	7440-41-7	E421/VA	0.000020	mg/L	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020
Bismuth, dissolved	7440-69-9	E421/VA	0.000050	mg/L	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050
Boron, dissolved	7440-42-8	E421/VA	0.010	mg/L	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Cadmium, dissolved	7440-43-9	E421/VA	0.0000050	mg/L	<0.0000050	<0.0000050	<0.0000050	<0.0000050	0.0000052	
Calcium, dissolved	7440-70-2	E421/VA	0.050	mg/L	6.79	6.59	6.82	6.72	6.78	
Cesium, dissolved	7440-46-2	E421/VA	0.000010	mg/L	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
Chromium, dissolved	7440-47-3	E421/VA	0.00050	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Cobalt, dissolved	7440-48-4	E421/VA	0.00010	mg/L	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Copper, dissolved	7440-50-8	E421/VA	0.00020	mg/L	0.00049	0.00050	0.00040	0.00043	0.00054	
Iron, dissolved	7439-89-6	E421/VA	0.010	mg/L	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Lead, dissolved	7439-92-1	E421/VA	0.000050	mg/L	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050
Lithium, dissolved	7439-93-2	E421/VA	0.0010	mg/L	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Magnesium, dissolved	7439-95-4	E421/VA	0.0050	mg/L	0.514	0.504	0.503	0.524	0.501	
Manganese, dissolved	7439-96-5	E421/VA	0.00010	mg/L	0.00012	0.00020	0.00018	0.00034	0.00046	
Molybdenum, dissolved	7439-98-7	E421/VA	0.000050	mg/L	0.000430	0.000412	0.000430	0.000444	0.000401	
Nickel, dissolved	7440-02-0	E421/VA	0.00050	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Phosphorus, dissolved	7723-14-0	E421/VA	0.050	mg/L	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
Potassium, dissolved	7440-09-7	E421/VA	0.050	mg/L	0.287	0.287	0.297	0.283	0.279	
Rubidium, dissolved	7440-17-7	E421/VA	0.00020	mg/L	0.00033	0.00036	0.00040	0.00034	0.00037	
Selenium, dissolved	7782-49-2	E421/VA	0.000050	mg/L	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050
Silicon, dissolved	7440-21-3	E421/VA	0.050	mg/L	1.44	1.44	1.41	1.38	1.41	
Silver, dissolved	7440-22-4	E421/VA	0.000010	mg/L	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
Sodium, dissolved	7440-23-5	E421/VA	0.050	mg/L	0.649	0.627	0.640	0.638	0.616	
Strontium, dissolved	7440-24-6	E421/VA	0.00020	mg/L	0.0304	0.0292	0.0298	0.0298	0.0295	
Sulfur, dissolved	7704-34-9	E421/VA	0.50	mg/L	1.34	1.24	1.15	1.40	1.24	
Tellurium, dissolved	13494-80-9	E421/VA	0.00020	mg/L	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
Thallium, dissolved	7440-28-0	E421/VA	0.000010	mg/L	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010



Analytical Results

Sub-Matrix: Water					Client sample ID	MOR 1D	MOR 2D	MOR 3D	MOR 1S	MOR 2S
(Matrix: Water)										
Client sampling date / time					28-Aug-2023 09:10	28-Aug-2023 07:30	28-Aug-2023 06:15	28-Aug-2023 09:10	28-Aug-2023 07:30	
Analyte	CAS Number	Method/Lab	LOR	Unit	VA23C0167-001	VA23C0167-002	VA23C0167-003	VA23C0167-004	VA23C0167-005	
					Result	Result	Result	Result	Result	
Dissolved Metals										
Thorium, dissolved	7440-29-1	E421/VA	0.00010	mg/L	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Tin, dissolved	7440-31-5	E421/VA	0.00010	mg/L	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Titanium, dissolved	7440-32-6	E421/VA	0.00030	mg/L	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030
Tungsten, dissolved	7440-33-7	E421/VA	0.00010	mg/L	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Uranium, dissolved	7440-61-1	E421/VA	0.000010	mg/L	0.000020	0.000027	0.000022	0.000021	0.000027	
Vanadium, dissolved	7440-62-2	E421/VA	0.00050	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Zinc, dissolved	7440-66-6	E421/VA	0.0010	mg/L	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Zirconium, dissolved	7440-67-7	E421/VA	0.00030	mg/L	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030
Dissolved metals filtration location	----	EP421/VA	-	-	Laboratory	Field	Laboratory	Laboratory	Laboratory	Field
Plant Pigments										
Chlorophyll a	479-61-8	E870A/VA	0.0020	µg/sample	0.256	0.212	0.233	0.258	0.254	

Please refer to the General Comments section for an explanation of any result qualifiers detected.

Please refer to the Accreditation section for an explanation of analyte accreditations.



Analytical Results

Sub-Matrix: Water					Client sample ID	MOR3S	Field Blank	Travel Blank	----	----
(Matrix: Water)										
					Client sampling date / time	28-Aug-2023 06:15	28-Aug-2023 06:15	28-Aug-2023 00:00	----	----
Analyte	CAS Number	Method/Lab	LOR	Unit	VA23C0167-006	VA23C0167-007	VA23C0167-008	-----	-----	
					Result	Result	Result	----	----	
Physical Tests										
Alkalinity, total (as CaCO3)	----	E290/VA	1.0	mg/L	15.8	<1.0	<1.0	----	----	
Solids, total dissolved [TDS]	----	E162/VA	10	mg/L	26	<10	<10	----	----	
Anions and Nutrients										
Ammonia, total (as N)	7664-41-7	E298/VA	0.0050	mg/L	<0.0050	<0.0050	<0.0050	----	----	
Nitrate (as N)	14797-55-8	E235.NO3-L/V A	0.0050	mg/L	0.0135	<0.0050	<0.0050	----	----	
Nitrate + Nitrite (as N)	----	EC235.N+N/V A	0.0050	mg/L	0.0135	<0.0051	<0.0051	----	----	
Nitrite (as N)	14797-65-0	E235.NO2-L/V A	0.0010	mg/L	<0.0010	<0.0010	<0.0010	----	----	
Nitrogen, total	7727-37-9	E366/VA	0.030	mg/L	0.043	<0.030	<0.030	----	----	
Nitrogen, total dissolved	----	E368/VA	0.030	mg/L	<0.030	<0.030	----	----	----	
Phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U/VA	0.0010	mg/L	<0.0010	<0.0010	<0.0010	----	----	
Phosphorus, total	7723-14-0	E372-U/VA	0.0020	mg/L	<0.0020	<0.0020	<0.0020	----	----	
Phosphorus, total dissolved	7723-14-0	E375-T/VA	0.0020	mg/L	<0.0020	<0.0020 <sup>SFP</sup>	----	----	----	
Silicate (as SiO2)	7631-86-9	E392/VA	0.50	mg/L	2.78	<0.50	<0.50	----	----	
Organic / Inorganic Carbon										
Carbon, dissolved organic [DOC]	----	E358-L/VA	0.50	mg/L	1.40	<0.50	----	----	----	
Total Metals										
Aluminum, total	7429-90-5	E420/VA	0.0030	mg/L	0.0284	<0.0030	<0.0030	----	----	
Antimony, total	7440-36-0	E420/VA	0.00010	mg/L	<0.00010	<0.00010	<0.00010	----	----	
Arsenic, total	7440-38-2	E420/VA	0.00010	mg/L	<0.00010	<0.00010	<0.00010	----	----	
Barium, total	7440-39-3	E420/VA	0.00010	mg/L	0.0160	<0.00010	<0.00010	----	----	
Beryllium, total	7440-41-7	E420/VA	0.000020	mg/L	<0.000020	<0.000020	<0.000020	----	----	
Bismuth, total	7440-69-9	E420/VA	0.000050	mg/L	<0.000050	<0.000050	<0.000050	----	----	
Boron, total	7440-42-8	E420/VA	0.010	mg/L	<0.010	<0.010	<0.010	----	----	
Cadmium, total	7440-43-9	E420/VA	0.0000050	mg/L	0.0000057	<0.0000050	<0.0000050	----	----	
Calcium, total	7440-70-2	E420/VA	0.050	mg/L	6.56	<0.050	<0.050	----	----	
Cesium, total	7440-46-2	E420/VA	0.000010	mg/L	<0.000010	<0.000010	<0.000010	----	----	
Chromium, total	7440-47-3	E420/VA	0.00050	mg/L	<0.00050	<0.00050	<0.00050	----	----	
Cobalt, total	7440-48-4	E420/VA	0.00010	mg/L	<0.00010	<0.00010	<0.00010	----	----	



Analytical Results

Sub-Matrix: Water					Client sample ID	MOR3S	Field Blank	Travel Blank	----	----
(Matrix: Water)										
Client sampling date / time					28-Aug-2023 06:15	28-Aug-2023 06:15	28-Aug-2023 00:00	----	----	
Analyte	CAS Number	Method/Lab	LOR	Unit	VA23C0167-006	VA23C0167-007	VA23C0167-008	-----	-----	
					Result	Result	Result	----	----	
Total Metals										
Copper, total	7440-50-8	E420/VA	0.00050	mg/L	0.00054	<0.00050	<0.00050	----	----	
Iron, total	7439-89-6	E420/VA	0.010	mg/L	0.021	<0.010	<0.010	----	----	
Lead, total	7439-92-1	E420/VA	0.000050	mg/L	<0.000050	<0.000050	<0.000050	----	----	
Lithium, total	7439-93-2	E420/VA	0.0010	mg/L	<0.0010	<0.0010	<0.0010	----	----	
Magnesium, total	7439-95-4	E420/VA	0.0050	mg/L	0.531	<0.0050	<0.0050	----	----	
Manganese, total	7439-96-5	E420/VA	0.00010	mg/L	0.00108	<0.00010	<0.00010	----	----	
Molybdenum, total	7439-98-7	E420/VA	0.000050	mg/L	0.000438	<0.000050	0.000114 <sup>RRV</sup>	----	----	
Nickel, total	7440-02-0	E420/VA	0.00050	mg/L	<0.00050	<0.00050	<0.00050	----	----	
Phosphorus, total	7723-14-0	E420/VA	0.050	mg/L	<0.050	<0.050	<0.050	----	----	
Potassium, total	7440-09-7	E420/VA	0.050	mg/L	0.293	<0.050	<0.050	----	----	
Rubidium, total	7440-17-7	E420/VA	0.00020	mg/L	0.00036	<0.00020	<0.00020	----	----	
Selenium, total	7782-49-2	E420/VA	0.000050	mg/L	<0.000050	<0.000050	<0.000050	----	----	
Silicon, total	7440-21-3	E420/VA	0.10	mg/L	1.42	<0.10	<0.10	----	----	
Silver, total	7440-22-4	E420/VA	0.000010	mg/L	<0.000010	<0.000010	<0.000010	----	----	
Sodium, total	7440-23-5	E420/VA	0.050	mg/L	0.635	<0.050	<0.050	----	----	
Strontium, total	7440-24-6	E420/VA	0.00020	mg/L	0.0268	<0.00020	<0.00020	----	----	
Sulfur, total	7704-34-9	E420/VA	0.50	mg/L	1.07	<0.50	<0.50	----	----	
Tellurium, total	13494-80-9	E420/VA	0.00020	mg/L	<0.00020	<0.00020	<0.00020	----	----	
Thallium, total	7440-28-0	E420/VA	0.000010	mg/L	<0.000010	<0.000010	<0.000010	----	----	
Thorium, total	7440-29-1	E420/VA	0.00010	mg/L	<0.00010	<0.00010	<0.00010	----	----	
Tin, total	7440-31-5	E420/VA	0.00010	mg/L	<0.00010	<0.00010	<0.00010	----	----	
Titanium, total	7440-32-6	E420/VA	0.00030	mg/L	0.00053	<0.00030	<0.00030	----	----	
Tungsten, total	7440-33-7	E420/VA	0.00010	mg/L	<0.00010	<0.00010	<0.00010	----	----	
Uranium, total	7440-61-1	E420/VA	0.000010	mg/L	0.000028	<0.000010	<0.000010	----	----	
Vanadium, total	7440-62-2	E420/VA	0.00050	mg/L	<0.00050	<0.00050	<0.00050	----	----	
Zinc, total	7440-66-6	E420/VA	0.0030	mg/L	<0.0030	<0.0030	<0.0030	----	----	
Zirconium, total	7440-67-7	E420/VA	0.00020	mg/L	<0.00020	<0.00020	<0.00020	----	----	
Dissolved Metals										
Aluminum, dissolved	7429-90-5	E421/VA	0.0010	mg/L	0.0082	<0.0010	----	----	----	
Antimony, dissolved	7440-36-0	E421/VA	0.00010	mg/L	<0.00010	<0.00010	----	----	----	





Analytical Results

Sub-Matrix: Water					Client sample ID	MOR3S	Field Blank	Travel Blank	----	----
(Matrix: Water)										
Client sampling date / time					28-Aug-2023 06:15	28-Aug-2023 06:15	28-Aug-2023 00:00	----	----	
Analyte	CAS Number	Method/Lab	LOR	Unit	VA23C0167-006	VA23C0167-007	VA23C0167-008	-----	-----	
					Result	Result	Result	----	----	
Dissolved Metals										
Arsenic, dissolved	7440-38-2	E421/VA	0.00010	mg/L	<0.00010	<0.00010	----	----	----	
Barium, dissolved	7440-39-3	E421/VA	0.00010	mg/L	0.0156	<0.00010	----	----	----	
Beryllium, dissolved	7440-41-7	E421/VA	0.000020	mg/L	<0.000020	<0.000020	----	----	----	
Bismuth, dissolved	7440-69-9	E421/VA	0.000050	mg/L	<0.000050	<0.000050	----	----	----	
Boron, dissolved	7440-42-8	E421/VA	0.010	mg/L	<0.010	<0.010	----	----	----	
Cadmium, dissolved	7440-43-9	E421/VA	0.0000050	mg/L	<0.0000050	<0.0000050	----	----	----	
Calcium, dissolved	7440-70-2	E421/VA	0.050	mg/L	6.74	<0.050	----	----	----	
Cesium, dissolved	7440-46-2	E421/VA	0.000010	mg/L	<0.000010	<0.000010	----	----	----	
Chromium, dissolved	7440-47-3	E421/VA	0.00050	mg/L	<0.00050	<0.00050	----	----	----	
Cobalt, dissolved	7440-48-4	E421/VA	0.00010	mg/L	<0.00010	<0.00010	----	----	----	
Copper, dissolved	7440-50-8	E421/VA	0.00020	mg/L	0.00041	<0.00020	----	----	----	
Iron, dissolved	7439-89-6	E421/VA	0.010	mg/L	<0.010	<0.010	----	----	----	
Lead, dissolved	7439-92-1	E421/VA	0.000050	mg/L	<0.000050	<0.000050	----	----	----	
Lithium, dissolved	7439-93-2	E421/VA	0.0010	mg/L	<0.0010	<0.0010	----	----	----	
Magnesium, dissolved	7439-95-4	E421/VA	0.0050	mg/L	0.504	<0.0050	----	----	----	
Manganese, dissolved	7439-96-5	E421/VA	0.00010	mg/L	0.00026	<0.00010	----	----	----	
Molybdenum, dissolved	7439-98-7	E421/VA	0.000050	mg/L	0.000430	<0.000050	----	----	----	
Nickel, dissolved	7440-02-0	E421/VA	0.00050	mg/L	<0.00050	<0.00050	----	----	----	
Phosphorus, dissolved	7723-14-0	E421/VA	0.050	mg/L	<0.050	<0.050	----	----	----	
Potassium, dissolved	7440-09-7	E421/VA	0.050	mg/L	0.289	<0.050	----	----	----	
Rubidium, dissolved	7440-17-7	E421/VA	0.00020	mg/L	0.00038	<0.00020	----	----	----	
Selenium, dissolved	7782-49-2	E421/VA	0.000050	mg/L	<0.000050	<0.000050	----	----	----	
Silicon, dissolved	7440-21-3	E421/VA	0.050	mg/L	1.36	<0.050	----	----	----	
Silver, dissolved	7440-22-4	E421/VA	0.000010	mg/L	<0.000010	<0.000010	----	----	----	
Sodium, dissolved	7440-23-5	E421/VA	0.050	mg/L	0.626	<0.050	----	----	----	
Strontium, dissolved	7440-24-6	E421/VA	0.00020	mg/L	0.0298	<0.00020	----	----	----	
Sulfur, dissolved	7704-34-9	E421/VA	0.50	mg/L	1.13	<0.50	----	----	----	
Tellurium, dissolved	13494-80-9	E421/VA	0.00020	mg/L	<0.00020	<0.00020	----	----	----	
Thallium, dissolved	7440-28-0	E421/VA	0.000010	mg/L	<0.000010	<0.000010	----	----	----	
Thorium, dissolved	7440-29-1	E421/VA	0.00010	mg/L	<0.00010	<0.00010	----	----	----	



Analytical Results

Sub-Matrix: Water					Client sample ID	MOR3S	Field Blank	Travel Blank	----	----
(Matrix: Water)										
					Client sampling date / time	28-Aug-2023 06:15	28-Aug-2023 06:15	28-Aug-2023 00:00	----	----
Analyte	CAS Number	Method/Lab	LOR	Unit	VA23C0167-006	VA23C0167-007	VA23C0167-008	-----	-----	
					Result	Result	Result	----	----	
Dissolved Metals										
Tin, dissolved	7440-31-5	E421/VA	0.00010	mg/L	<0.00010	<0.00010	----	----	----	
Titanium, dissolved	7440-32-6	E421/VA	0.00030	mg/L	<0.00030	<0.00030	----	----	----	
Tungsten, dissolved	7440-33-7	E421/VA	0.00010	mg/L	<0.00010	<0.00010	----	----	----	
Uranium, dissolved	7440-61-1	E421/VA	0.000010	mg/L	0.000026	<0.000010	----	----	----	
Vanadium, dissolved	7440-62-2	E421/VA	0.00050	mg/L	<0.00050	<0.00050	----	----	----	
Zinc, dissolved	7440-66-6	E421/VA	0.0010	mg/L	<0.0010	<0.0010	----	----	----	
Zirconium, dissolved	7440-67-7	E421/VA	0.00030	mg/L	<0.00030	<0.00030	----	----	----	
Dissolved metals filtration location	----	EP421/VA	-	-	Laboratory	Laboratory	----	----	----	
Plant Pigments										
Chlorophyll a	479-61-8	E870A/VA	0.0020	µg/sample	0.310	----	----	----	----	

Please refer to the General Comments section for an explanation of any result qualifiers detected.

Please refer to the Accreditation section for an explanation of analyte accreditations.

## QUALITY CONTROL INTERPRETIVE REPORT

Work Order	: <b>VA23C0167</b>	Page	: 1 of 21
Client	: <b>Northwest Research and Monitoring Ltd.</b>	Laboratory	: ALS Environmental - Vancouver
Contact	: Laura Guillon	Account Manager	: Sneha Sansare
Address	: PO Box 4357 Smithers BC Canada V0J 2N0	Address	: 8081 Lougheed Highway Burnaby, British Columbia Canada V5A 1W9
Telephone	: ----	Telephone	: +1 604 253 4188
Project	: MWMT 2023-MORICE LAKE	Date Samples Received	: 28-Aug-2023 10:05
PO	: ----	Issue Date	: 06-Sep-2023 11:09
C-O-C number	: 20-1014750		
Sampler	: ----		
Site	: ----		
Quote number	: Q72918		
No. of samples received	: 8		
No. of samples analysed	: 8		

This report is automatically generated by the ALS LIMS (Laboratory Information Management System) through evaluation of Quality Control (QC) results and other QA parameters associated with this submission, and is intended to facilitate rapid data validation by auditors or reviewers. The report highlights any exceptions and outliers to ALS Data Quality Objectives, provides holding time details and exceptions, summarizes QC sample frequencies, and lists applicable methodology references and summaries.

### Key

**Anonymous:** Refers to samples which are not part of this work order, but which formed part of the QC process lot.

**CAS Number:** Chemical Abstracts Service number is a unique identifier assigned to discrete substances.

**DQO:** Data Quality Objective.

**LOR:** Limit of Reporting (detection limit).

**RPD:** Relative Percent Difference.

### **Workorder Comments**

Holding times are displayed as "----" if no guidance exists from CCME, Canadian provinces, or broadly recognized international references.

### **Summary of Outliers**

#### **Outliers : Quality Control Samples**

- No Method Blank value outliers occur.
- No Duplicate outliers occur.
- No Laboratory Control Sample (LCS) outliers occur
- No Matrix Spike outliers occur.
- No Test sample Surrogate recovery outliers exist.

#### **Outliers: Reference Material (RM) Samples**

- No Reference Material (RM) Sample outliers occur.

### ***Outliers : Analysis Holding Time Compliance (Breaches)***

- No Analysis Holding Time Outliers exist.

### ***Outliers : Frequency of Quality Control Samples***

- No Quality Control Sample Frequency Outliers occur.



## Analysis Holding Time Compliance

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times, which are selected to meet known provincial and /or federal requirements. In the absence of regulatory hold times, ALS establishes recommendations based on guidelines published by organizations such as CCME, US EPA, APHA Standard Methods, ASTM, or Environment Canada (where available). Dates and holding times reported below represent the first dates of extraction or analysis. If subsequent tests or dilutions exceeded holding times, qualifiers are added (refer to COA).

If samples are identified below as having been analyzed or extracted outside of recommended holding times, measurement uncertainties may be increased, and this should be taken into consideration when interpreting results.

Where actual sampling date is not provided on the chain of custody, the date of receipt with time at 00:00 is used for calculation purposes.

Where only the sample date without time is provided on the chain of custody, the sampling date at 00:00 is used for calculation purposes.

Matrix: **Water**

Evaluation: ✖ = Holding time exceedance ; ✔ = Within Holding Time

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval
				Rec	Actual			Rec	Actual	
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid) Field Blank	E298	28-Aug-2023	30-Aug-2023	28 days	2 days	✓	30-Aug-2023	28 days	2 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid) MOR 1D	E298	28-Aug-2023	30-Aug-2023	28 days	2 days	✓	30-Aug-2023	28 days	2 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid) MOR 1S	E298	28-Aug-2023	30-Aug-2023	28 days	2 days	✓	30-Aug-2023	28 days	2 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid) MOR 2D	E298	28-Aug-2023	30-Aug-2023	28 days	2 days	✓	30-Aug-2023	28 days	2 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid) MOR 2S	E298	28-Aug-2023	30-Aug-2023	28 days	2 days	✓	30-Aug-2023	28 days	2 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid) MOR 3D	E298	28-Aug-2023	30-Aug-2023	28 days	2 days	✓	30-Aug-2023	28 days	2 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid) MOR3S	E298	28-Aug-2023	30-Aug-2023	28 days	2 days	✓	30-Aug-2023	28 days	2 days	✓



Matrix: **Water** Evaluation: ✖ = Holding time exceedance ; ✔ = Within Holding Time

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval
				Rec	Actual			Rec	Actual	
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid) Travel Blank	E298	28-Aug-2023	30-Aug-2023	28 days	2 days	✓	30-Aug-2023	28 days	2 days	✓
Anions and Nutrients : Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001										
HDPE Field Blank	E378-U	28-Aug-2023	30-Aug-2023	3 days	2 days	✓	30-Aug-2023	3 days	2 days	✓
Anions and Nutrients : Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001										
HDPE MOR 1D	E378-U	28-Aug-2023	30-Aug-2023	3 days	2 days	✓	30-Aug-2023	3 days	2 days	✓
Anions and Nutrients : Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001										
HDPE MOR 1S	E378-U	28-Aug-2023	30-Aug-2023	3 days	2 days	✓	30-Aug-2023	3 days	2 days	✓
Anions and Nutrients : Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001										
HDPE MOR 2D	E378-U	28-Aug-2023	30-Aug-2023	3 days	2 days	✓	30-Aug-2023	3 days	2 days	✓
Anions and Nutrients : Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001										
HDPE MOR 2S	E378-U	28-Aug-2023	30-Aug-2023	3 days	2 days	✓	30-Aug-2023	3 days	2 days	✓
Anions and Nutrients : Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001										
HDPE MOR 3D	E378-U	28-Aug-2023	30-Aug-2023	3 days	2 days	✓	30-Aug-2023	3 days	2 days	✓
Anions and Nutrients : Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001										
HDPE MOR3S	E378-U	28-Aug-2023	30-Aug-2023	3 days	2 days	✓	30-Aug-2023	3 days	2 days	✓



Matrix: **Water** Evaluation: ✖ = Holding time exceedance ; ✔ = Within Holding Time

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval
				Rec	Actual			Rec	Actual	
Anions and Nutrients : Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001)										
HDPE Travel Blank	E378-U	28-Aug-2023	30-Aug-2023	3 days	2 days	✓	30-Aug-2023	3 days	2 days	✓
Anions and Nutrients : Nitrate in Water by IC (Low Level)										
HDPE Travel Blank	E235.NO3-L	28-Aug-2023	30-Aug-2023	3 days	2 days	✓	30-Aug-2023	3 days	1 days	✓
Anions and Nutrients : Nitrate in Water by IC (Low Level)										
HDPE Field Blank	E235.NO3-L	28-Aug-2023	30-Aug-2023	3 days	2 days	✓	30-Aug-2023	3 days	2 days	✓
Anions and Nutrients : Nitrate in Water by IC (Low Level)										
HDPE MOR 1D	E235.NO3-L	28-Aug-2023	30-Aug-2023	3 days	2 days	✓	30-Aug-2023	3 days	2 days	✓
Anions and Nutrients : Nitrate in Water by IC (Low Level)										
HDPE MOR 1S	E235.NO3-L	28-Aug-2023	30-Aug-2023	3 days	2 days	✓	30-Aug-2023	3 days	2 days	✓
Anions and Nutrients : Nitrate in Water by IC (Low Level)										
HDPE MOR 2D	E235.NO3-L	28-Aug-2023	30-Aug-2023	3 days	2 days	✓	30-Aug-2023	3 days	2 days	✓
Anions and Nutrients : Nitrate in Water by IC (Low Level)										
HDPE MOR 2S	E235.NO3-L	28-Aug-2023	30-Aug-2023	3 days	2 days	✓	30-Aug-2023	3 days	2 days	✓
Anions and Nutrients : Nitrate in Water by IC (Low Level)										
HDPE MOR 3D	E235.NO3-L	28-Aug-2023	30-Aug-2023	3 days	2 days	✓	30-Aug-2023	3 days	2 days	✓
Anions and Nutrients : Nitrate in Water by IC (Low Level)										
HDPE MOR3S	E235.NO3-L	28-Aug-2023	30-Aug-2023	3 days	2 days	✓	30-Aug-2023	3 days	2 days	✓



Matrix: **Water** Evaluation: ✖ = Holding time exceedance ; ✔ = Within Holding Time

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval
				Rec	Actual			Rec	Actual	
Anions and Nutrients : Nitrite in Water by IC (Low Level)										
HDPE Travel Blank	E235.NO2-L	28-Aug-2023	30-Aug-2023	3 days	2 days	✓	30-Aug-2023	3 days	1 days	✓
Anions and Nutrients : Nitrite in Water by IC (Low Level)										
HDPE Field Blank	E235.NO2-L	28-Aug-2023	30-Aug-2023	3 days	2 days	✓	30-Aug-2023	3 days	2 days	✓
Anions and Nutrients : Nitrite in Water by IC (Low Level)										
HDPE MOR 1D	E235.NO2-L	28-Aug-2023	30-Aug-2023	3 days	2 days	✓	30-Aug-2023	3 days	2 days	✓
Anions and Nutrients : Nitrite in Water by IC (Low Level)										
HDPE MOR 1S	E235.NO2-L	28-Aug-2023	30-Aug-2023	3 days	2 days	✓	30-Aug-2023	3 days	2 days	✓
Anions and Nutrients : Nitrite in Water by IC (Low Level)										
HDPE MOR 2D	E235.NO2-L	28-Aug-2023	30-Aug-2023	3 days	2 days	✓	30-Aug-2023	3 days	2 days	✓
Anions and Nutrients : Nitrite in Water by IC (Low Level)										
HDPE MOR 2S	E235.NO2-L	28-Aug-2023	30-Aug-2023	3 days	2 days	✓	30-Aug-2023	3 days	2 days	✓
Anions and Nutrients : Nitrite in Water by IC (Low Level)										
HDPE MOR 3D	E235.NO2-L	28-Aug-2023	30-Aug-2023	3 days	2 days	✓	30-Aug-2023	3 days	2 days	✓
Anions and Nutrients : Nitrite in Water by IC (Low Level)										
HDPE MOR3S	E235.NO2-L	28-Aug-2023	30-Aug-2023	3 days	2 days	✓	30-Aug-2023	3 days	2 days	✓
Anions and Nutrients : Reactive Silica by Colourimetry										
HDPE Field Blank	E392	28-Aug-2023	----	----	----		30-Aug-2023	28 days	2 days	✓





Matrix: **Water** Evaluation: ✖ = Holding time exceedance ; ✔ = Within Holding Time

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval
				Rec	Actual			Rec	Actual	
Anions and Nutrients : Reactive Silica by Colourimetry										
HDPE MOR 1D	E392	28-Aug-2023	----	----	----		30-Aug-2023	28 days	2 days	✓
Anions and Nutrients : Reactive Silica by Colourimetry										
HDPE MOR 1S	E392	28-Aug-2023	----	----	----		30-Aug-2023	28 days	2 days	✓
Anions and Nutrients : Reactive Silica by Colourimetry										
HDPE MOR 2D	E392	28-Aug-2023	----	----	----		30-Aug-2023	28 days	2 days	✓
Anions and Nutrients : Reactive Silica by Colourimetry										
HDPE MOR 2S	E392	28-Aug-2023	----	----	----		30-Aug-2023	28 days	2 days	✓
Anions and Nutrients : Reactive Silica by Colourimetry										
HDPE MOR 3D	E392	28-Aug-2023	----	----	----		30-Aug-2023	28 days	2 days	✓
Anions and Nutrients : Reactive Silica by Colourimetry										
HDPE MOR3S	E392	28-Aug-2023	----	----	----		30-Aug-2023	28 days	2 days	✓
Anions and Nutrients : Reactive Silica by Colourimetry										
HDPE Travel Blank	E392	28-Aug-2023	----	----	----		30-Aug-2023	28 days	2 days	✓
Anions and Nutrients : Total Dissolved Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass dissolved (sulfuric acid) Field Blank	E375-T	28-Aug-2023	31-Aug-2023	28 days	3 days	✓	01-Sep-2023	28 days	4 days	✓
Anions and Nutrients : Total Dissolved Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass dissolved (sulfuric acid) MOR 1D	E375-T	28-Aug-2023	31-Aug-2023	28 days	3 days	✓	01-Sep-2023	28 days	4 days	✓



Matrix: **Water** Evaluation: ✖ = Holding time exceedance ; ✔ = Within Holding Time

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval
				Rec	Actual			Rec	Actual	
Anions and Nutrients : Total Dissolved Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass dissolved (sulfuric acid) MOR 1S	E375-T	28-Aug-2023	31-Aug-2023	28 days	3 days	✓	01-Sep-2023	28 days	4 days	✓
Anions and Nutrients : Total Dissolved Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass dissolved (sulfuric acid) MOR 2D	E375-T	28-Aug-2023	31-Aug-2023	28 days	3 days	✓	01-Sep-2023	28 days	4 days	✓
Anions and Nutrients : Total Dissolved Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass dissolved (sulfuric acid) MOR 2S	E375-T	28-Aug-2023	31-Aug-2023	28 days	3 days	✓	01-Sep-2023	28 days	4 days	✓
Anions and Nutrients : Total Dissolved Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass dissolved (sulfuric acid) MOR 3D	E375-T	28-Aug-2023	31-Aug-2023	28 days	3 days	✓	01-Sep-2023	28 days	4 days	✓
Anions and Nutrients : Total Dissolved Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass dissolved (sulfuric acid) MOR3S	E375-T	28-Aug-2023	31-Aug-2023	28 days	3 days	✓	01-Sep-2023	28 days	4 days	✓
Anions and Nutrients : Total Dissolved Nitrogen by Colourimetry										
Amber glass dissolved (sulfuric acid) Field Blank	E368	28-Aug-2023	31-Aug-2023	28 days	3 days	✓	01-Sep-2023	28 days	4 days	✓
Anions and Nutrients : Total Dissolved Nitrogen by Colourimetry										
Amber glass dissolved (sulfuric acid) MOR 1D	E368	28-Aug-2023	31-Aug-2023	28 days	3 days	✓	01-Sep-2023	28 days	4 days	✓
Anions and Nutrients : Total Dissolved Nitrogen by Colourimetry										
Amber glass dissolved (sulfuric acid) MOR 1S	E368	28-Aug-2023	31-Aug-2023	28 days	3 days	✓	01-Sep-2023	28 days	4 days	✓
Anions and Nutrients : Total Dissolved Nitrogen by Colourimetry										
Amber glass dissolved (sulfuric acid) MOR 2D	E368	28-Aug-2023	31-Aug-2023	28 days	3 days	✓	01-Sep-2023	28 days	4 days	✓



Matrix: **Water** Evaluation: ✖ = Holding time exceedance ; ✔ = Within Holding Time

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval
				Rec	Actual			Rec	Actual	
Anions and Nutrients : Total Dissolved Nitrogen by Colourimetry										
Amber glass dissolved (sulfuric acid) MOR 2S	E368	28-Aug-2023	31-Aug-2023	28 days	3 days	✓	01-Sep-2023	28 days	4 days	✓
Anions and Nutrients : Total Dissolved Nitrogen by Colourimetry										
Amber glass dissolved (sulfuric acid) MOR 3D	E368	28-Aug-2023	31-Aug-2023	28 days	3 days	✓	01-Sep-2023	28 days	4 days	✓
Anions and Nutrients : Total Dissolved Nitrogen by Colourimetry										
Amber glass dissolved (sulfuric acid) MOR3S	E368	28-Aug-2023	31-Aug-2023	28 days	3 days	✓	01-Sep-2023	28 days	4 days	✓
Anions and Nutrients : Total Nitrogen by Colourimetry										
Amber glass total (sulfuric acid) Field Blank	E366	28-Aug-2023	30-Aug-2023	28 days	2 days	✓	31-Aug-2023	28 days	3 days	✓
Anions and Nutrients : Total Nitrogen by Colourimetry										
Amber glass total (sulfuric acid) MOR 1D	E366	28-Aug-2023	30-Aug-2023	28 days	2 days	✓	31-Aug-2023	28 days	3 days	✓
Anions and Nutrients : Total Nitrogen by Colourimetry										
Amber glass total (sulfuric acid) MOR 1S	E366	28-Aug-2023	30-Aug-2023	28 days	2 days	✓	31-Aug-2023	28 days	3 days	✓
Anions and Nutrients : Total Nitrogen by Colourimetry										
Amber glass total (sulfuric acid) MOR 2D	E366	28-Aug-2023	30-Aug-2023	28 days	2 days	✓	31-Aug-2023	28 days	3 days	✓
Anions and Nutrients : Total Nitrogen by Colourimetry										
Amber glass total (sulfuric acid) MOR 2S	E366	28-Aug-2023	30-Aug-2023	28 days	2 days	✓	31-Aug-2023	28 days	3 days	✓
Anions and Nutrients : Total Nitrogen by Colourimetry										
Amber glass total (sulfuric acid) MOR 3D	E366	28-Aug-2023	30-Aug-2023	28 days	2 days	✓	31-Aug-2023	28 days	3 days	✓



Matrix: **Water** Evaluation: ✖ = Holding time exceedance ; ✔ = Within Holding Time

Analyte Group	Method	Sampling Date	Extraction / Preparation				Analysis			
Container / Client Sample ID(s)			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval
				Rec	Actual			Rec	Actual	
Anions and Nutrients : Total Nitrogen by Colourimetry										
Amber glass total (sulfuric acid) MOR3S	E366	28-Aug-2023	30-Aug-2023	28 days	2 days	✓	31-Aug-2023	28 days	3 days	✓
Anions and Nutrients : Total Nitrogen by Colourimetry										
Amber glass total (sulfuric acid) Travel Blank	E366	28-Aug-2023	30-Aug-2023	28 days	2 days	✓	31-Aug-2023	28 days	3 days	✓
Anions and Nutrients : Total Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass total (sulfuric acid) Field Blank	E372-U	28-Aug-2023	30-Aug-2023	28 days	2 days	✓	31-Aug-2023	28 days	3 days	✓
Anions and Nutrients : Total Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass total (sulfuric acid) MOR 1D	E372-U	28-Aug-2023	30-Aug-2023	28 days	2 days	✓	31-Aug-2023	28 days	3 days	✓
Anions and Nutrients : Total Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass total (sulfuric acid) MOR 1S	E372-U	28-Aug-2023	30-Aug-2023	28 days	2 days	✓	31-Aug-2023	28 days	3 days	✓
Anions and Nutrients : Total Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass total (sulfuric acid) MOR 2D	E372-U	28-Aug-2023	30-Aug-2023	28 days	2 days	✓	31-Aug-2023	28 days	3 days	✓
Anions and Nutrients : Total Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass total (sulfuric acid) MOR 2S	E372-U	28-Aug-2023	30-Aug-2023	28 days	2 days	✓	31-Aug-2023	28 days	3 days	✓
Anions and Nutrients : Total Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass total (sulfuric acid) MOR 3D	E372-U	28-Aug-2023	30-Aug-2023	28 days	2 days	✓	31-Aug-2023	28 days	3 days	✓
Anions and Nutrients : Total Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass total (sulfuric acid) MOR3S	E372-U	28-Aug-2023	30-Aug-2023	28 days	2 days	✓	31-Aug-2023	28 days	3 days	✓



Matrix: **Water** Evaluation: ✖ = Holding time exceedance ; ✔ = Within Holding Time

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval
				Rec	Actual			Rec	Actual	
Anions and Nutrients : Total Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass total (sulfuric acid) Travel Blank	E372-U	28-Aug-2023	30-Aug-2023	28 days	2 days	✓	31-Aug-2023	28 days	3 days	✓
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE - dissolved (lab preserved) Field Blank	E421	28-Aug-2023	30-Aug-2023	180 days	2 days	✓	31-Aug-2023	180 days	3 days	✓
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE - dissolved (lab preserved) MOR 1D	E421	28-Aug-2023	30-Aug-2023	180 days	2 days	✓	31-Aug-2023	180 days	3 days	✓
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE - dissolved (lab preserved) MOR 1S	E421	28-Aug-2023	30-Aug-2023	180 days	2 days	✓	31-Aug-2023	180 days	3 days	✓
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE - dissolved (lab preserved) MOR 2D	E421	28-Aug-2023	30-Aug-2023	180 days	2 days	✓	31-Aug-2023	180 days	3 days	✓
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE - dissolved (lab preserved) MOR 2S	E421	28-Aug-2023	30-Aug-2023	180 days	2 days	✓	31-Aug-2023	180 days	3 days	✓
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE - dissolved (lab preserved) MOR 3D	E421	28-Aug-2023	30-Aug-2023	180 days	2 days	✓	31-Aug-2023	180 days	3 days	✓
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE - dissolved (lab preserved) MOR3S	E421	28-Aug-2023	30-Aug-2023	180 days	2 days	✓	31-Aug-2023	180 days	3 days	✓
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass dissolved (sulfuric acid) Field Blank	E358-L	28-Aug-2023	31-Aug-2023	28 days	3 days	✓	31-Aug-2023	28 days	3 days	✓



Matrix: **Water** Evaluation: ✖ = Holding time exceedance ; ✔ = Within Holding Time

Analyte Group	Method	Sampling Date	Extraction / Preparation				Analysis			
Container / Client Sample ID(s)			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval
				Rec	Actual			Rec	Actual	
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass dissolved (sulfuric acid) MOR 1D	E358-L	28-Aug-2023	31-Aug-2023	28 days	3 days	✓	31-Aug-2023	28 days	3 days	✓
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass dissolved (sulfuric acid) MOR 1S	E358-L	28-Aug-2023	31-Aug-2023	28 days	3 days	✓	31-Aug-2023	28 days	3 days	✓
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass dissolved (sulfuric acid) MOR 2D	E358-L	28-Aug-2023	31-Aug-2023	28 days	3 days	✓	31-Aug-2023	28 days	3 days	✓
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass dissolved (sulfuric acid) MOR 2S	E358-L	28-Aug-2023	31-Aug-2023	28 days	3 days	✓	31-Aug-2023	28 days	3 days	✓
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass dissolved (sulfuric acid) MOR 3D	E358-L	28-Aug-2023	31-Aug-2023	28 days	3 days	✓	31-Aug-2023	28 days	3 days	✓
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass dissolved (sulfuric acid) MOR3S	E358-L	28-Aug-2023	31-Aug-2023	28 days	3 days	✓	31-Aug-2023	28 days	3 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE Field Blank	E290	28-Aug-2023	30-Aug-2023	14 days	2 days	✓	30-Aug-2023	14 days	2 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE MOR 1D	E290	28-Aug-2023	30-Aug-2023	14 days	2 days	✓	30-Aug-2023	14 days	2 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE MOR 1S	E290	28-Aug-2023	30-Aug-2023	14 days	2 days	✓	30-Aug-2023	14 days	2 days	✓



Matrix: **Water** Evaluation: ✖ = Holding time exceedance ; ✔ = Within Holding Time

Analyte Group	Method	Sampling Date	Extraction / Preparation				Analysis			
Container / Client Sample ID(s)			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval
				Rec	Actual			Rec	Actual	
Physical Tests : Alkalinity Species by Titration										
HDPE MOR 2D	E290	28-Aug-2023	30-Aug-2023	14 days	2 days	✓	30-Aug-2023	14 days	2 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE MOR 2S	E290	28-Aug-2023	30-Aug-2023	14 days	2 days	✓	30-Aug-2023	14 days	2 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE MOR 3D	E290	28-Aug-2023	30-Aug-2023	14 days	2 days	✓	30-Aug-2023	14 days	2 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE MOR3S	E290	28-Aug-2023	30-Aug-2023	14 days	2 days	✓	30-Aug-2023	14 days	2 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE Travel Blank	E290	28-Aug-2023	30-Aug-2023	14 days	2 days	✓	30-Aug-2023	14 days	2 days	✓
Physical Tests : TDS by Gravimetry										
HDPE Travel Blank	E162	28-Aug-2023	----	----	----		01-Sep-2023	7 days	3 days	✓
Physical Tests : TDS by Gravimetry										
HDPE Field Blank	E162	28-Aug-2023	----	----	----		01-Sep-2023	7 days	4 days	✓
Physical Tests : TDS by Gravimetry										
HDPE MOR 1D	E162	28-Aug-2023	----	----	----		01-Sep-2023	7 days	4 days	✓
Physical Tests : TDS by Gravimetry										
HDPE MOR 1S	E162	28-Aug-2023	----	----	----		01-Sep-2023	7 days	4 days	✓



Matrix: **Water** Evaluation: ✖ = Holding time exceedance ; ✔ = Within Holding Time

Analyte Group	Method	Sampling Date	Extraction / Preparation				Analysis			
Container / Client Sample ID(s)			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval
				Rec	Actual			Rec	Actual	
Physical Tests : TDS by Gravimetry										
HDPE MOR 2D	E162	28-Aug-2023	----	----	----		01-Sep-2023	7 days	4 days	✓
Physical Tests : TDS by Gravimetry										
HDPE MOR 2S	E162	28-Aug-2023	----	----	----		01-Sep-2023	7 days	4 days	✓
Physical Tests : TDS by Gravimetry										
HDPE MOR 3D	E162	28-Aug-2023	----	----	----		01-Sep-2023	7 days	4 days	✓
Physical Tests : TDS by Gravimetry										
HDPE MOR3S	E162	28-Aug-2023	----	----	----		01-Sep-2023	7 days	4 days	✓
Plant Pigments : Chlorophyll-a by Fluorometry (Field Filtered µg)										
Opaque HDPE tube MOR 1D	E870A	28-Aug-2023	31-Aug-2023	28 days	3 days	✓	31-Aug-2023	28 days	0 days	✓
Plant Pigments : Chlorophyll-a by Fluorometry (Field Filtered µg)										
Opaque HDPE tube MOR 1S	E870A	28-Aug-2023	31-Aug-2023	28 days	3 days	✓	31-Aug-2023	28 days	0 days	✓
Plant Pigments : Chlorophyll-a by Fluorometry (Field Filtered µg)										
Opaque HDPE tube MOR 2D	E870A	28-Aug-2023	31-Aug-2023	28 days	3 days	✓	31-Aug-2023	28 days	0 days	✓
Plant Pigments : Chlorophyll-a by Fluorometry (Field Filtered µg)										
Opaque HDPE tube MOR 2S	E870A	28-Aug-2023	31-Aug-2023	28 days	3 days	✓	31-Aug-2023	28 days	0 days	✓
Plant Pigments : Chlorophyll-a by Fluorometry (Field Filtered µg)										
Opaque HDPE tube MOR 3D	E870A	28-Aug-2023	31-Aug-2023	28 days	3 days	✓	31-Aug-2023	28 days	0 days	✓





Matrix: **Water** Evaluation: ✖ = Holding time exceedance ; ✔ = Within Holding Time

Analyte Group	Method	Sampling Date	Extraction / Preparation				Analysis			
Container / Client Sample ID(s)			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval
				Rec	Actual			Rec	Actual	
Plant Pigments : Chlorophyll-a by Fluorometry (Field Filtered µg)										
Opaque HDPE tube MOR3S	E870A	28-Aug-2023	31-Aug-2023	28 days	3 days	✓	31-Aug-2023	28 days	0 days	✓
Total Metals : Total Metals in Water by CRC ICPMS										
HDPE - total (lab preserved) Travel Blank	E420	28-Aug-2023	30-Aug-2023	180 days	2 days	✓	01-Sep-2023	180 days	4 days	✓
Total Metals : Total Metals in Water by CRC ICPMS										
HDPE - total (lab preserved) Field Blank	E420	28-Aug-2023	30-Aug-2023	180 days	3 days	✓	01-Sep-2023	180 days	4 days	✓
Total Metals : Total Metals in Water by CRC ICPMS										
HDPE - total (lab preserved) MOR 1D	E420	28-Aug-2023	30-Aug-2023	180 days	3 days	✓	01-Sep-2023	180 days	4 days	✓
Total Metals : Total Metals in Water by CRC ICPMS										
HDPE - total (lab preserved) MOR 1S	E420	28-Aug-2023	30-Aug-2023	180 days	3 days	✓	01-Sep-2023	180 days	4 days	✓
Total Metals : Total Metals in Water by CRC ICPMS										
HDPE - total (lab preserved) MOR 2D	E420	28-Aug-2023	30-Aug-2023	180 days	3 days	✓	01-Sep-2023	180 days	4 days	✓
Total Metals : Total Metals in Water by CRC ICPMS										
HDPE - total (lab preserved) MOR 2S	E420	28-Aug-2023	30-Aug-2023	180 days	3 days	✓	01-Sep-2023	180 days	4 days	✓
Total Metals : Total Metals in Water by CRC ICPMS										
HDPE - total (lab preserved) MOR 3D	E420	28-Aug-2023	30-Aug-2023	180 days	3 days	✓	01-Sep-2023	180 days	4 days	✓
Total Metals : Total Metals in Water by CRC ICPMS										
HDPE - total (lab preserved) MOR3S	E420	28-Aug-2023	30-Aug-2023	180 days	3 days	✓	01-Sep-2023	180 days	4 days	✓

[Legend & Qualifier Definitions](#)

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Work Order : VA23C0167  
Client : Northwest Research and Monitoring Ltd.  
Project : MWMT 2023-MORICE LAKE



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Rec. HT: ALS recommended hold time (see units).



## Quality Control Parameter Frequency Compliance

The following report summarizes the frequency of laboratory QC samples analyzed within the analytical batches (QC lots) in which the submitted samples were processed. The actual frequency should be greater than or equal to the expected frequency.

Matrix: **Water**

Evaluation: ✖ = QC frequency outside specification; ✔ = QC frequency within specification.

Quality Control Sample Type			Count		Frequency (%)		
Analytical Methods	Method	QC Lot #	QC	Regular	Actual	Expected	Evaluation
Laboratory Duplicates (DUP)							
Alkalinity Species by Titration	E290	1110393	1	11	9.0	5.0	✓
Ammonia by Fluorescence	E298	1110601	1	14	7.1	5.0	✓
Dissolved Metals in Water by CRC ICPMS	E421	1110359	2	22	9.0	5.0	✓
Dissolved Organic Carbon by Combustion (Low Level)	E358-L	1112591	1	8	12.5	5.0	✓
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001 mg/L)	E378-U	1110390	1	17	5.8	5.0	✓
Nitrate in Water by IC (Low Level)	E235.NO3-L	1110396	1	15	6.6	5.0	✓
Nitrite in Water by IC (Low Level)	E235.NO2-L	1110395	1	15	6.6	5.0	✓
Reactive Silica by Colourimetry	E392	1112123	1	11	9.0	5.0	✓
TDS by Gravimetry	E162	1114741	1	20	5.0	5.0	✓
Total Dissolved Phosphorus by Colourimetry (0.002 mg/L)	E375-T	1112592	1	19	5.2	5.0	✓
Total Dissolved Nitrogen by Colourimetry	E368	1112593	1	7	14.2	5.0	✓
Total Metals in Water by CRC ICPMS	E420	1111190	1	20	5.0	5.0	✓
Total Nitrogen by Colourimetry	E366	1110599	1	8	12.5	5.0	✓
Total Phosphorus by Colourimetry (0.002 mg/L)	E372-U	1110600	1	14	7.1	5.0	✓
Laboratory Control Samples (LCS)							
Alkalinity Species by Titration	E290	1110393	1	11	9.0	5.0	✓
Ammonia by Fluorescence	E298	1110601	1	14	7.1	5.0	✓
Chlorophyll-a by Fluorometry (Field Filtered µg)	E870A	1113669	1	14	7.1	5.0	✓
Dissolved Metals in Water by CRC ICPMS	E421	1110359	2	22	9.0	5.0	✓
Dissolved Organic Carbon by Combustion (Low Level)	E358-L	1112591	1	8	12.5	5.0	✓
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001 mg/L)	E378-U	1110390	1	17	5.8	5.0	✓
Nitrate in Water by IC (Low Level)	E235.NO3-L	1110396	1	15	6.6	5.0	✓
Nitrite in Water by IC (Low Level)	E235.NO2-L	1110395	1	15	6.6	5.0	✓
Reactive Silica by Colourimetry	E392	1112123	1	11	9.0	5.0	✓
TDS by Gravimetry	E162	1114741	1	20	5.0	5.0	✓
Total Dissolved Phosphorus by Colourimetry (0.002 mg/L)	E375-T	1112592	1	19	5.2	5.0	✓
Total Dissolved Nitrogen by Colourimetry	E368	1112593	1	7	14.2	5.0	✓
Total Metals in Water by CRC ICPMS	E420	1111190	1	20	5.0	5.0	✓
Total Nitrogen by Colourimetry	E366	1110599	1	8	12.5	5.0	✓
Total Phosphorus by Colourimetry (0.002 mg/L)	E372-U	1110600	1	14	7.1	5.0	✓
Method Blanks (MB)							
Alkalinity Species by Titration	E290	1110393	1	11	9.0	5.0	✓
Ammonia by Fluorescence	E298	1110601	1	14	7.1	5.0	✓
Chlorophyll-a by Fluorometry (Field Filtered µg)	E870A	1113669	1	14	7.1	5.0	✓
Dissolved Metals in Water by CRC ICPMS	E421	1110359	2	22	9.0	5.0	✓



Matrix: **Water**

Evaluation: ✖ = QC frequency outside specification; ✔ = QC frequency within specification.

Quality Control Sample Type			Count		Frequency (%)		
Analytical Methods	Method	QC Lot #	QC	Regular	Actual	Expected	Evaluation
<b>Method Blanks (MB) - Continued</b>							
Dissolved Organic Carbon by Combustion (Low Level)	E358-L	1112591	1	8	12.5	5.0	✔
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001 mg/L)	E378-U	1110390	1	17	5.8	5.0	✔
Nitrate in Water by IC (Low Level)	E235.NO3-L	1110396	1	15	6.6	5.0	✔
Nitrite in Water by IC (Low Level)	E235.NO2-L	1110395	1	15	6.6	5.0	✔
Reactive Silica by Colourimetry	E392	1112123	1	11	9.0	5.0	✔
TDS by Gravimetry	E162	1114741	1	20	5.0	5.0	✔
Total Dissolved Phosphorus by Colourimetry (0.002 mg/L)	E375-T	1112592	1	19	5.2	5.0	✔
Total Dissolved Nitrogen by Colourimetry	E368	1112593	1	7	14.2	5.0	✔
Total Metals in Water by CRC ICPMS	E420	1111190	1	20	5.0	5.0	✔
Total Nitrogen by Colourimetry	E366	1110599	1	8	12.5	5.0	✔
Total Phosphorus by Colourimetry (0.002 mg/L)	E372-U	1110600	1	14	7.1	5.0	✔
<b>Matrix Spikes (MS)</b>							
Ammonia by Fluorescence	E298	1110601	1	14	7.1	5.0	✔
Dissolved Metals in Water by CRC ICPMS	E421	1110359	2	22	9.0	5.0	✔
Dissolved Organic Carbon by Combustion (Low Level)	E358-L	1112591	1	8	12.5	5.0	✔
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001 mg/L)	E378-U	1110390	1	17	5.8	5.0	✔
Nitrate in Water by IC (Low Level)	E235.NO3-L	1110396	1	15	6.6	5.0	✔
Nitrite in Water by IC (Low Level)	E235.NO2-L	1110395	1	15	6.6	5.0	✔
Reactive Silica by Colourimetry	E392	1112123	1	11	9.0	5.0	✔
Total Dissolved Phosphorus by Colourimetry (0.002 mg/L)	E375-T	1112592	1	19	5.2	5.0	✔
Total Dissolved Nitrogen by Colourimetry	E368	1112593	1	7	14.2	5.0	✔
Total Metals in Water by CRC ICPMS	E420	1111190	1	20	5.0	5.0	✔
Total Nitrogen by Colourimetry	E366	1110599	1	8	12.5	5.0	✔
Total Phosphorus by Colourimetry (0.002 mg/L)	E372-U	1110600	1	14	7.1	5.0	✔



## Methodology References and Summaries

The analytical methods used by ALS are developed using internationally recognized reference methods (where available), such as those published by US EPA, APHA Standard Methods, ASTM, ISO, Environment Canada, BC MOE, and Ontario MOE. Reference methods may incorporate modifications to improve performance (indicated by "mod").

Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
TDS by Gravimetry	E162 ALS Environmental - Vancouver	Water	APHA 2540 C (mod)	Total Dissolved Solids (TDS) are determined by filtering a sample through a glass fibre filter, with evaporation of the filtrate at $180 \pm 2^{\circ}\text{C}$ for 16 hours or to constant weight, with gravimetric measurement of the residue.
Nitrite in Water by IC (Low Level)	E235.NO2-L ALS Environmental - Vancouver	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Nitrate in Water by IC (Low Level)	E235.NO3-L ALS Environmental - Vancouver	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Alkalinity Species by Titration	E290 ALS Environmental - Vancouver	Water	APHA 2320 B (mod)	Total alkalinity is determined by potentiometric titration to a pH 4.5 endpoint. Bicarbonate, carbonate and hydroxide alkalinity are calculated from phenolphthalein alkalinity and total alkalinity values.
Ammonia by Fluorescence	E298 ALS Environmental - Vancouver	Water	Method Fialab 100, 2018	Ammonia in water is determined by automated continuous flow analysis with membrane diffusion and fluorescence detection, after reaction with OPA (ortho-phthalaldehyde). This method is approved under US EPA 40 CFR Part 136 (May 2021)
Dissolved Organic Carbon by Combustion (Low Level)	E358-L ALS Environmental - Vancouver	Water	APHA 5310 B (mod)	Dissolved Organic Carbon (Non-Purgeable), also known as NPOC (dissolved), is a direct measurement of DOC after a filtered (0.45 micron) sample has been acidified and purged to remove inorganic carbon (IC). Analysis is by high temperature combustion with infrared detection of CO <sub>2</sub> . NPOC does not include volatile organic species that are purged off with IC. For samples where the majority of DC (dissolved carbon) is comprised of IC (which is common), this method is more accurate and more reliable than the DOC by subtraction method (i.e. DC minus DIC).
Total Nitrogen by Colourimetry	E366 ALS Environmental - Vancouver	Water	Chinchilla Scientific Nitrate Method, 2011	Following digestion, total nitrogen is determined colourimetrically using a discrete analyzer utilizing the vanadium chloride reduction method. This method of analysis is approved under US EPA 40 CFR Part 136 (May 2021).
Total Dissolved Nitrogen by Colourimetry	E368 ALS Environmental - Vancouver	Water	APHA 4500-P J (mod)	Total Dissolved Nitrogen is determined colourimetrically using a discrete analyzer after filtration through a 0.45 micron filter followed by heated persulfate digestion of the sample.
Total Phosphorus by Colourimetry (0.002 mg/L)	E372-U ALS Environmental - Vancouver	Water	APHA 4500-P E (mod).	Total Phosphorus is determined colourimetrically using a discrete analyzer after heated persulfate digestion of the sample.



Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Total Dissolved Phosphorus by Colourimetry (0.002 mg/L)	E375-T ALS Environmental - Vancouver	Water	APHA 4500-P E (mod).	Total Dissolved Phosphorus is determined colourimetrically using a discrete analyzer after filtration through a 0.45 micron filter followed by heated persulfate digestion of the sample.
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001 mg/L)	E378-U ALS Environmental - Vancouver	Water	APHA 4500-P F (mod)	Dissolved Orthophosphate is determined colourimetrically on a sample that has been lab or field filtered through a 0.45 micron membrane filter.  Field filtration is recommended to ensure test results represent conditions at time of sampling.
Reactive Silica by Colourimetry	E392 ALS Environmental - Vancouver	Water	APHA 4500-SiO <sub>2</sub> E (mod)	Silicate (molybdate-reactive silica) is determined by the molybdosilicate-heteropoly blue colourimetric method using a discrete analyzer. Method Limitation: Arsenic (5+) above 100 mg/L is a negative interference on this test
Total Metals in Water by CRC ICPMS	E420 ALS Environmental - Vancouver	Water	EPA 200.2/6020B (mod)	Water samples are digested with nitric and hydrochloric acids, and analyzed by Collision/Reaction Cell ICPMS.  Method Limitation (re: Sulfur): Sulfide and volatile sulfur species may not be recovered by this method.
Dissolved Metals in Water by CRC ICPMS	E421 ALS Environmental - Vancouver	Water	APHA 3030B/EPA 6020B (mod)	Water samples are filtered (0.45 um), preserved with nitric acid, and analyzed by Collision/Reaction Cell ICPMS.  Method Limitation (re: Sulfur): Sulfide and volatile sulfur species may not be recovered by this method.
Chlorophyll-a by Fluorometry (Field Filtered µg)	E870A ALS Environmental - Vancouver	Water	EPA 445.0 (mod)	Chlorophyll-a is determined by solvent extraction followed with analysis by fluorometry using the non-acidification procedure. Sampling volume not provided by client.
Nitrate and Nitrite (as N) (Calculation)	EC235.N+N ALS Environmental - Vancouver	Water	EPA 300.0	Nitrate and Nitrite (as N) is a calculated parameter. Nitrate and Nitrite (as N) = Nitrite (as N) + Nitrate (as N).

Preparation Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Preparation for Ammonia	EP298 ALS Environmental - Vancouver	Water		Sample preparation for Preserved Nutrients Water Quality Analysis.
Preparation for Dissolved Organic Carbon for Combustion	EP358 ALS Environmental - Vancouver	Water	APHA 5310 B (mod)	Preparation for Dissolved Organic Carbon
Digestion for Total Nitrogen in water	EP366 ALS Environmental - Vancouver	Water	APHA 4500-P J (mod)	Samples for total nitrogen analysis are digested using a heated persulfate digestion. Nitrogen compounds are converted to nitrate in this digestion.



<i>Preparation Methods</i>	<i>Method / Lab</i>	<i>Matrix</i>	<i>Method Reference</i>	<i>Method Descriptions</i>
Digestion for Total Dissolved Nitrogen in water	EP368 ALS Environmental - Vancouver	Water	APHA 4500-P J (mod)	Samples are filtration through a 0.45 micron filter and then heated with a persulfate digestion reagent.
Digestion for Total Phosphorus in water	EP372 ALS Environmental - Vancouver	Water	APHA 4500-P E (mod).	Samples are heated with a persulfate digestion reagent.
Digestion for Dissolved Phosphorus in water	EP375 ALS Environmental - Vancouver	Water	APHA 4500-P E (mod).	Samples are filtered through a 0.45 micron membrane filter and then heated with a persulfate digestion reagent.
Dissolved Metals Water Filtration	EP421 ALS Environmental - Vancouver	Water	APHA 3030B	Water samples are filtered (0.45 um), and preserved with HNO <sub>3</sub> .
Chlorophyll-a Extraction (Field Filtered)	EP870A ALS Environmental - Vancouver	Water	EPA 445.0 (mod)	Chlorophyll-a solvent extraction.

## QUALITY CONTROL REPORT

Work Order	: <b>VA23C0167</b>	Page	: 1 of 22
Client	: Northwest Research and Monitoring Ltd.	Laboratory	: ALS Environmental - Vancouver
Contact	: Laura Guillon	Account Manager	: Sneha Sansare
Address	: PO Box 4357 Smithers BC Canada V0J 2N0	Address	: 8081 Lougheed Highway Burnaby, British Columbia Canada V5A 1W9
Telephone	:	Telephone	: +1 604 253 4188
Project	: MWMT 2023-MORICE LAKE	Date Samples Received	: 28-Aug-2023 10:05
PO	: ----	Date Analysis Commenced	: 30-Aug-2023
C-O-C number	: 20-1014750	Issue Date	: 06-Sep-2023 11:09
Sampler	: ----      ----		
Site	: ----		
Quote number	: Q72918		
No. of samples received	: 8		
No. of samples analysed	: 8		

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. This document shall not be reproduced, except in full.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percent Difference (RPD) and Data Quality Objectives
- Matrix Spike (MS) Report; Recovery and Data Quality Objectives
- Method Blank (MB) Report; Recovery and Data Quality Objectives
- Laboratory Control Sample (LCS) Report; Recovery and Data Quality Objectives

### Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is conducted in accordance with US FDA 21 CFR Part 11.

Signatories	Position	Laboratory Department
Anshim Anshim	Lab Assistant	Vancouver Metals, Burnaby, British Columbia
Erin Sanchez		Vancouver Metals, Burnaby, British Columbia
Kevin Duarte	Supervisor - Metals ICP Instrumentation	Vancouver Metals, Burnaby, British Columbia
Lindsay Gung	Supervisor - Water Chemistry	Vancouver Inorganics, Burnaby, British Columbia
Robin Weeks	Team Leader - Metals	Vancouver Inorganics, Burnaby, British Columbia
Tracy Harley	Supervisor - Water Quality Instrumentation	Vancouver Inorganics, Burnaby, British Columbia





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## General Comments

The ALS Quality Control (QC) report is optionally provided to ALS clients upon request. ALS test methods include comprehensive QC checks with every analysis to ensure our high standards of quality are met. Each QC result has a known or expected target value, which is compared against predetermined Data Quality Objectives (DQOs) to provide confidence in the accuracy of associated test results. This report contains detailed results for all QC results applicable to this sample submission. Please refer to the ALS Quality Control Interpretation report (QCI) for applicable method references and methodology summaries.

### Key :

Anonymous = Refers to samples which are not part of this work order, but which formed part of the QC process lot.

CAS Number = Chemical Abstracts Service number is a unique identifier assigned to discrete substances.

DQO = Data Quality Objective.

LOR = Limit of Reporting (detection limit).

RPD = Relative Percent Difference

# = Indicates a QC result that did not meet the ALS DQO.

## Workorder Comments

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Holding times are displayed as "---" if no guidance exists from CCME, Canadian provinces, or broadly recognized international references.

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Laboratory Duplicate (DUP) Report

A Laboratory Duplicate (DUP) is a randomly selected intralaboratory replicate sample. Laboratory Duplicates provide information regarding method precision and sample heterogeneity. ALS DQOs for Laboratory Duplicates are expressed as test-specific limits for Relative Percent Difference (RPD), or as an absolute difference limit of 2 times the LOR for low concentration duplicates within ~ 4-10 times the LOR (cut-off is test-specific).

Sub-Matrix: Water					Laboratory Duplicate (DUP) Report						
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	LOR	Unit	Original Result	Duplicate Result	RPD(%) or Difference	Duplicate Limits	Qualifier
Physical Tests (QC Lot: 1110393)											
VA23C0131-003	Anonymous	Alkalinity, total (as CaCO3)	----	E290	1.0	mg/L	49.7	49.9	0.402%	20%	----
Physical Tests (QC Lot: 1114741)											
VA23C0128-010	Anonymous	Solids, total dissolved [TDS]	----	E162	13	mg/L	63	64	2	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 1110390)											
VA23C0121-001	Anonymous	Phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.0200	mg/L	0.929	0.941	1.23%	20%	----
Anions and Nutrients (QC Lot: 1110395)											
VA23C0131-001	Anonymous	Nitrite (as N)	14797-65-0	E235.NO2-L	0.0010	mg/L	<0.0010	<0.0010	0	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 1110396)											
VA23C0131-001	Anonymous	Nitrate (as N)	14797-55-8	E235.NO3-L	0.0050	mg/L	0.0427	0.0426	0.00010	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 1110599)											
VA23C0167-001	MOR 1D	Nitrogen, total	7727-37-9	E366	0.030	mg/L	0.060	0.063	0.003	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 1110600)											
VA23C0167-001	MOR 1D	Phosphorus, total	7723-14-0	E372-U	0.0020	mg/L	0.0021	0.0020	0.00006	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 1110601)											
VA23C0167-001	MOR 1D	Ammonia, total (as N)	7664-41-7	E298	0.0050	mg/L	<0.0050	<0.0050	0	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 1112123)											
GP2301723-001	Anonymous	Silicate (as SiO2)	7631-86-9	E392	0.50	mg/L	3.41	3.40	0.02	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 1112592)											
VA23B9955-004	Anonymous	Phosphorus, total dissolved	7723-14-0	E375-T	0.0020	mg/L	0.0484	0.0485	0.206%	20%	----
Anions and Nutrients (QC Lot: 1112593)											
VA23C0167-001	MOR 1D	Nitrogen, total dissolved	----	E368	0.030	mg/L	<0.030	0.042	0.012	Diff <2x LOR	----
Organic / Inorganic Carbon (QC Lot: 1112591)											
VA23B9955-004	Anonymous	Carbon, dissolved organic [DOC]	----	E358-L	0.50	mg/L	3.50	3.53	0.03	Diff <2x LOR	----
Total Metals (QC Lot: 1111190)											
VA23C0167-001	MOR 1D	Aluminum, total	7429-90-5	E420	0.0030	mg/L	0.0146	0.0126	0.0020	Diff <2x LOR	----
		Antimony, total	7440-36-0	E420	0.00010	mg/L	<0.00010	<0.00010	0	Diff <2x LOR	----
		Arsenic, total	7440-38-2	E420	0.00010	mg/L	<0.00010	<0.00010	0	Diff <2x LOR	----
		Barium, total	7440-39-3	E420	0.00010	mg/L	0.0157	0.0157	0.328%	20%	----
		Beryllium, total	7440-41-7	E420	0.000020	mg/L	<0.000020	<0.000020	0	Diff <2x LOR	----
		Bismuth, total	7440-69-9	E420	0.000050	mg/L	<0.000050	<0.000050	0	Diff <2x LOR	----



Sub-Matrix: Water					Laboratory Duplicate (DUP) Report						
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	LOR	Unit	Original Result	Duplicate Result	RPD(%) or Difference	Duplicate Limits	Qualifier
Total Metals (QC Lot: 1111190) - continued											
VA23C0167-001	MOR 1D	Boron, total	7440-42-8	E420	0.010	mg/L	<0.010	<0.010	0	Diff <2x LOR	----
		Cadmium, total	7440-43-9	E420	0.0000050	mg/L	0.0000060	<0.0000050	0.0000010	Diff <2x LOR	----
		Calcium, total	7440-70-2	E420	0.050	mg/L	6.48	6.66	2.74%	20%	----
		Cesium, total	7440-46-2	E420	0.000010	mg/L	<0.000010	<0.000010	0	Diff <2x LOR	----
		Chromium, total	7440-47-3	E420	0.00050	mg/L	<0.00050	<0.00050	0	Diff <2x LOR	----
		Cobalt, total	7440-48-4	E420	0.00010	mg/L	<0.00010	<0.00010	0	Diff <2x LOR	----
		Copper, total	7440-50-8	E420	0.00050	mg/L	<0.00050	<0.00050	0	Diff <2x LOR	----
		Iron, total	7439-89-6	E420	0.010	mg/L	0.011	<0.010	0.0009	Diff <2x LOR	----
		Lead, total	7439-92-1	E420	0.000050	mg/L	<0.000050	<0.000050	0	Diff <2x LOR	----
		Lithium, total	7439-93-2	E420	0.0010	mg/L	<0.0010	<0.0010	0	Diff <2x LOR	----
		Magnesium, total	7439-95-4	E420	0.0050	mg/L	0.537	0.531	1.15%	20%	----
		Manganese, total	7439-96-5	E420	0.00010	mg/L	0.00080	0.00067	0.00013	Diff <2x LOR	----
		Molybdenum, total	7439-98-7	E420	0.000050	mg/L	0.000419	0.000409	0.000010	Diff <2x LOR	----
		Nickel, total	7440-02-0	E420	0.00050	mg/L	<0.00050	<0.00050	0	Diff <2x LOR	----
		Phosphorus, total	7723-14-0	E420	0.050	mg/L	<0.050	<0.050	0	Diff <2x LOR	----
		Potassium, total	7440-09-7	E420	0.050	mg/L	0.286	0.277	0.009	Diff <2x LOR	----
		Rubidium, total	7440-17-7	E420	0.00020	mg/L	0.00037	0.00034	0.00003	Diff <2x LOR	----
		Selenium, total	7782-49-2	E420	0.000050	mg/L	<0.000050	<0.000050	0	Diff <2x LOR	----
		Silicon, total	7440-21-3	E420	0.10	mg/L	1.47	1.45	1.43%	20%	----
		Silver, total	7440-22-4	E420	0.000010	mg/L	<0.000010	<0.000010	0	Diff <2x LOR	----
		Sodium, total	7440-23-5	E420	0.050	mg/L	0.650	0.641	1.46%	20%	----
		Strontium, total	7440-24-6	E420	0.00020	mg/L	0.0280	0.0271	3.52%	20%	----
		Sulfur, total	7704-34-9	E420	0.50	mg/L	1.06	1.10	0.05	Diff <2x LOR	----
		Tellurium, total	13494-80-9	E420	0.00020	mg/L	<0.00020	<0.00020	0	Diff <2x LOR	----
		Thallium, total	7440-28-0	E420	0.000010	mg/L	<0.000010	<0.000010	0	Diff <2x LOR	----
		Thorium, total	7440-29-1	E420	0.00010	mg/L	<0.00010	<0.00010	0	Diff <2x LOR	----
		Tin, total	7440-31-5	E420	0.00010	mg/L	<0.00010	<0.00010	0	Diff <2x LOR	----
		Titanium, total	7440-32-6	E420	0.00030	mg/L	<0.00030	<0.00030	0	Diff <2x LOR	----
		Tungsten, total	7440-33-7	E420	0.00010	mg/L	<0.00010	<0.00010	0	Diff <2x LOR	----
		Uranium, total	7440-61-1	E420	0.000010	mg/L	0.000026	0.000024	0.000002	Diff <2x LOR	----
		Vanadium, total	7440-62-2	E420	0.00050	mg/L	<0.00050	<0.00050	0	Diff <2x LOR	----
		Zinc, total	7440-66-6	E420	0.0030	mg/L	<0.0030	<0.0030	0	Diff <2x LOR	----
		Zirconium, total	7440-67-7	E420	0.00020	mg/L	<0.00020	<0.00020	0	Diff <2x LOR	----
Dissolved Metals (QC Lot: 1110359)											



Sub-Matrix: Water					Laboratory Duplicate (DUP) Report						
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	LOR	Unit	Original Result	Duplicate Result	RPD(%) or Difference	Duplicate Limits	Qualifier
Dissolved Metals (QC Lot: 1110359) - continued											
VA23C0167-002	MOR 2D	Aluminum, dissolved	7429-90-5	E421	0.0010	mg/L	0.0083	0.0090	0.0007	Diff <2x LOR	----
		Antimony, dissolved	7440-36-0	E421	0.00010	mg/L	<0.00010	<0.00010	0	Diff <2x LOR	----
		Arsenic, dissolved	7440-38-2	E421	0.00010	mg/L	<0.00010	<0.00010	0	Diff <2x LOR	----
		Barium, dissolved	7440-39-3	E421	0.00010	mg/L	0.0149	0.0150	0.453%	20%	----
		Beryllium, dissolved	7440-41-7	E421	0.000020	mg/L	<0.000020	<0.000020	0	Diff <2x LOR	----
		Bismuth, dissolved	7440-69-9	E421	0.000050	mg/L	<0.000050	<0.000050	0	Diff <2x LOR	----
		Boron, dissolved	7440-42-8	E421	0.010	mg/L	<0.010	<0.010	0	Diff <2x LOR	----
		Cadmium, dissolved	7440-43-9	E421	0.0000050	mg/L	<0.0000050	<0.0000050	0	Diff <2x LOR	----
		Calcium, dissolved	7440-70-2	E421	0.050	mg/L	6.59	6.57	0.264%	20%	----
		Cesium, dissolved	7440-46-2	E421	0.000010	mg/L	<0.000010	<0.000010	0	Diff <2x LOR	----
		Chromium, dissolved	7440-47-3	E421	0.00050	mg/L	<0.00050	<0.00050	0	Diff <2x LOR	----
		Cobalt, dissolved	7440-48-4	E421	0.00010	mg/L	<0.00010	<0.00010	0	Diff <2x LOR	----
		Copper, dissolved	7440-50-8	E421	0.00020	mg/L	0.00050	0.00051	0.000009	Diff <2x LOR	----
		Iron, dissolved	7439-89-6	E421	0.010	mg/L	<0.010	<0.010	0	Diff <2x LOR	----
		Lead, dissolved	7439-92-1	E421	0.000050	mg/L	<0.000050	<0.000050	0	Diff <2x LOR	----
		Lithium, dissolved	7439-93-2	E421	0.0010	mg/L	<0.0010	<0.0010	0	Diff <2x LOR	----
		Magnesium, dissolved	7439-95-4	E421	0.0050	mg/L	0.504	0.497	1.25%	20%	----
		Manganese, dissolved	7439-96-5	E421	0.00010	mg/L	0.00020	0.00018	0.00002	Diff <2x LOR	----
		Molybdenum, dissolved	7439-98-7	E421	0.000050	mg/L	0.000412	0.000448	0.000036	Diff <2x LOR	----
		Nickel, dissolved	7440-02-0	E421	0.00050	mg/L	<0.00050	<0.00050	0	Diff <2x LOR	----
		Phosphorus, dissolved	7723-14-0	E421	0.050	mg/L	<0.050	<0.050	0	Diff <2x LOR	----
		Potassium, dissolved	7440-09-7	E421	0.050	mg/L	0.287	0.282	0.005	Diff <2x LOR	----
		Rubidium, dissolved	7440-17-7	E421	0.00020	mg/L	0.00036	0.00038	0.000010	Diff <2x LOR	----
		Selenium, dissolved	7782-49-2	E421	0.000050	mg/L	<0.000050	<0.000050	0	Diff <2x LOR	----
		Silicon, dissolved	7440-21-3	E421	0.050	mg/L	1.44	1.44	0.0984%	20%	----
		Silver, dissolved	7440-22-4	E421	0.000010	mg/L	<0.000010	<0.000010	0	Diff <2x LOR	----
		Sodium, dissolved	7440-23-5	E421	0.050	mg/L	0.627	0.621	0.905%	20%	----
		Strontium, dissolved	7440-24-6	E421	0.00020	mg/L	0.0292	0.0289	0.989%	20%	----
		Sulfur, dissolved	7704-34-9	E421	0.50	mg/L	1.24	1.30	0.07	Diff <2x LOR	----
		Tellurium, dissolved	13494-80-9	E421	0.00020	mg/L	<0.00020	<0.00020	0	Diff <2x LOR	----
		Thallium, dissolved	7440-28-0	E421	0.000010	mg/L	<0.000010	<0.000010	0	Diff <2x LOR	----
		Thorium, dissolved	7440-29-1	E421	0.00010	mg/L	<0.00010	<0.00010	0	Diff <2x LOR	----
		Tin, dissolved	7440-31-5	E421	0.00010	mg/L	<0.00010	<0.00010	0	Diff <2x LOR	----
		Titanium, dissolved	7440-32-6	E421	0.00030	mg/L	<0.00030	<0.00030	0	Diff <2x LOR	----



Sub-Matrix: Water					Laboratory Duplicate (DUP) Report						
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	LOR	Unit	Original Result	Duplicate Result	RPD(%) or Difference	Duplicate Limits	Qualifier
Dissolved Metals (QC Lot: 1110359) - continued											
VA23C0167-002	MOR 2D	Tungsten, dissolved	7440-33-7	E421	0.00010	mg/L	<0.00010	<0.00010	0	Diff <2x LOR	----
		Uranium, dissolved	7440-61-1	E421	0.000010	mg/L	0.000027	0.000028	0.0000003	Diff <2x LOR	----
		Vanadium, dissolved	7440-62-2	E421	0.00050	mg/L	<0.00050	<0.00050	0	Diff <2x LOR	----
		Zinc, dissolved	7440-66-6	E421	0.0010	mg/L	<0.0010	<0.0010	0	Diff <2x LOR	----
		Zirconium, dissolved	7440-67-7	E421	0.00030	mg/L	<0.00030	<0.00030	0	Diff <2x LOR	----
Dissolved Metals (QC Lot: 1111542)											
FJ2302146-001	Anonymous	Aluminum, dissolved	7429-90-5	E421	0.0020	mg/L	<0.0020	<0.0020	0	Diff <2x LOR	----
		Antimony, dissolved	7440-36-0	E421	0.00020	mg/L	0.00024	0.00024	0.000009	Diff <2x LOR	----
		Arsenic, dissolved	7440-38-2	E421	0.00020	mg/L	0.00028	0.00030	0.00002	Diff <2x LOR	----
		Barium, dissolved	7440-39-3	E421	0.00020	mg/L	0.0160	0.0160	0.0257%	20%	----
		Beryllium, dissolved	7440-41-7	E421	0.000040	mg/L	<0.000040	<0.000040	0	Diff <2x LOR	----
		Bismuth, dissolved	7440-69-9	E421	0.000100	mg/L	<0.000100	<0.000100	0	Diff <2x LOR	----
		Boron, dissolved	7440-42-8	E421	0.020	mg/L	0.058	0.056	0.003	Diff <2x LOR	----
		Cadmium, dissolved	7440-43-9	E421	0.0000100	mg/L	<0.0000100	<0.0000100	0	Diff <2x LOR	----
		Calcium, dissolved	7440-70-2	E421	0.100	mg/L	371	342	8.10%	20%	----
		Cesium, dissolved	7440-46-2	E421	0.000020	mg/L	0.000022	0.000020	0.000002	Diff <2x LOR	----
		Chromium, dissolved	7440-47-3	E421	0.00050	mg/L	<0.00050	<0.00050	0	Diff <2x LOR	----
		Cobalt, dissolved	7440-48-4	E421	0.00020	mg/L	<0.00020	<0.00020	0	Diff <2x LOR	----
		Copper, dissolved	7440-50-8	E421	0.00040	mg/L	<0.00040	<0.00040	0	Diff <2x LOR	----
		Iron, dissolved	7439-89-6	E421	0.020	mg/L	<0.020	<0.020	0	Diff <2x LOR	----
		Lead, dissolved	7439-92-1	E421	0.000100	mg/L	<0.000100	<0.000100	0	Diff <2x LOR	----
		Lithium, dissolved	7439-93-2	E421	0.0020	mg/L	0.0681	0.0640	6.11%	20%	----
		Magnesium, dissolved	7439-95-4	E421	0.0100	mg/L	197	193	2.13%	20%	----
		Manganese, dissolved	7439-96-5	E421	0.00020	mg/L	<0.00020	<0.00020	0	Diff <2x LOR	----
		Molybdenum, dissolved	7439-98-7	E421	0.000100	mg/L	0.000669	0.000645	0.000024	Diff <2x LOR	----
		Nickel, dissolved	7440-02-0	E421	0.00100	mg/L	0.00460	0.00433	0.00027	Diff <2x LOR	----
		Phosphorus, dissolved	7723-14-0	E421	0.100	mg/L	<0.100	<0.100	0	Diff <2x LOR	----
		Potassium, dissolved	7440-09-7	E421	0.100	mg/L	2.87	2.77	3.68%	20%	----
		Rubidium, dissolved	7440-17-7	E421	0.00040	mg/L	0.00221	0.00212	0.00010	Diff <2x LOR	----
		Selenium, dissolved	7782-49-2	E421	0.000100	mg/L	0.0122	0.0122	0.0916%	20%	----
		Silicon, dissolved	7440-21-3	E421	0.100	mg/L	0.760	0.739	0.020	Diff <2x LOR	----
		Silver, dissolved	7440-22-4	E421	0.000020	mg/L	<0.000020	<0.000020	0	Diff <2x LOR	----
		Sodium, dissolved	7440-23-5	E421	0.100	mg/L	4.74	4.66	1.73%	20%	----
		Strontium, dissolved	7440-24-6	E421	0.00040	mg/L	0.280	0.276	1.26%	20%	----



Sub-Matrix: Water					Laboratory Duplicate (DUP) Report						
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	LOR	Unit	Original Result	Duplicate Result	RPD(%) or Difference	Duplicate Limits	Qualifier
Dissolved Metals (QC Lot: 1111542) - continued											
FJ2302146-001	Anonymous	Sulfur, dissolved	7704-34-9	E421	1.00	mg/L	572	572	0.0707%	20%	----
		Tellurium, dissolved	13494-80-9	E421	0.00040	mg/L	<0.00040	<0.00040	0	Diff <2x LOR	----
		Thallium, dissolved	7440-28-0	E421	0.000020	mg/L	<0.000020	<0.000020	0	Diff <2x LOR	----
		Thorium, dissolved	7440-29-1	E421	0.00020	mg/L	<0.00020	<0.00020	0	Diff <2x LOR	----
		Tin, dissolved	7440-31-5	E421	0.00020	mg/L	<0.00020	<0.00020	0	Diff <2x LOR	----
		Titanium, dissolved	7440-32-6	E421	0.00060	mg/L	<0.00060	<0.00060	0	Diff <2x LOR	----
		Tungsten, dissolved	7440-33-7	E421	0.00020	mg/L	<0.00020	<0.00020	0	Diff <2x LOR	----
		Uranium, dissolved	7440-61-1	E421	0.000020	mg/L	0.00769	0.00761	1.11%	20%	----
		Vanadium, dissolved	7440-62-2	E421	0.00100	mg/L	<0.00100	<0.00100	0	Diff <2x LOR	----
		Zinc, dissolved	7440-66-6	E421	0.0020	mg/L	<0.0020	<0.0020	0	Diff <2x LOR	----
		Zirconium, dissolved	7440-67-7	E421	0.00040	mg/L	<0.00040	<0.00040	0	Diff <2x LOR	----



Method Blank (MB) Report

A Method Blank is an analyte-free matrix that undergoes sample processing identical to that carried out for test samples. Method Blank results are used to monitor and control for potential contamination from the laboratory environment and reagents. For most tests, the DQO for Method Blanks is for the result to be < LOR.

Sub-Matrix: Water

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Physical Tests (QCLot: 1110393)						
Alkalinity, total (as CaCO3)	----	E290	1	mg/L	1.4	----
Physical Tests (QCLot: 1114741)						
Solids, total dissolved [TDS]	----	E162	10	mg/L	<10	----
Anions and Nutrients (QCLot: 1110390)						
Phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.001	mg/L	<0.0010	----
Anions and Nutrients (QCLot: 1110395)						
Nitrite (as N)	14797-65-0	E235.NO2-L	0.001	mg/L	<0.0010	----
Anions and Nutrients (QCLot: 1110396)						
Nitrate (as N)	14797-55-8	E235.NO3-L	0.005	mg/L	<0.0050	----
Anions and Nutrients (QCLot: 1110599)						
Nitrogen, total	7727-37-9	E366	0.03	mg/L	<0.030	----
Anions and Nutrients (QCLot: 1110600)						
Phosphorus, total	7723-14-0	E372-U	0.002	mg/L	<0.0020	----
Anions and Nutrients (QCLot: 1110601)						
Ammonia, total (as N)	7664-41-7	E298	0.005	mg/L	<0.0050	----
Anions and Nutrients (QCLot: 1112123)						
Silicate (as SiO2)	7631-86-9	E392	0.5	mg/L	<0.50	----
Anions and Nutrients (QCLot: 1112592)						
Phosphorus, total dissolved	7723-14-0	E375-T	0.002	mg/L	<0.0020	----
Anions and Nutrients (QCLot: 1112593)						
Nitrogen, total dissolved	----	E368	0.03	mg/L	<0.030	----
Organic / Inorganic Carbon (QCLot: 1112591)						
Carbon, dissolved organic [DOC]	----	E358-L	0.5	mg/L	<0.50	----
Total Metals (QCLot: 1111190)						
Aluminum, total	7429-90-5	E420	0.003	mg/L	<0.0030	----
Antimony, total	7440-36-0	E420	0.0001	mg/L	<0.00010	----
Arsenic, total	7440-38-2	E420	0.0001	mg/L	<0.00010	----
Barium, total	7440-39-3	E420	0.0001	mg/L	<0.00010	----
Beryllium, total	7440-41-7	E420	0.00002	mg/L	<0.000020	----
Bismuth, total	7440-69-9	E420	0.00005	mg/L	<0.000050	----
Boron, total	7440-42-8	E420	0.01	mg/L	<0.010	----
Cadmium, total	7440-43-9	E420	0.000005	mg/L	<0.0000050	----



Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
<b>Total Metals (QCLot: 1111190) - continued</b>						
Calcium, total	7440-70-2	E420	0.05	mg/L	<0.050	----
Cesium, total	7440-46-2	E420	0.00001	mg/L	<0.000010	----
Chromium, total	7440-47-3	E420	0.0005	mg/L	<0.00050	----
Cobalt, total	7440-48-4	E420	0.0001	mg/L	<0.00010	----
Copper, total	7440-50-8	E420	0.0005	mg/L	<0.00050	----
Iron, total	7439-89-6	E420	0.01	mg/L	<0.010	----
Lead, total	7439-92-1	E420	0.00005	mg/L	<0.000050	----
Lithium, total	7439-93-2	E420	0.001	mg/L	<0.0010	----
Magnesium, total	7439-95-4	E420	0.005	mg/L	<0.0050	----
Manganese, total	7439-96-5	E420	0.0001	mg/L	<0.00010	----
Molybdenum, total	7439-98-7	E420	0.00005	mg/L	<0.000050	----
Nickel, total	7440-02-0	E420	0.0005	mg/L	<0.00050	----
Phosphorus, total	7723-14-0	E420	0.05	mg/L	<0.050	----
Potassium, total	7440-09-7	E420	0.05	mg/L	<0.050	----
Rubidium, total	7440-17-7	E420	0.0002	mg/L	<0.00020	----
Selenium, total	7782-49-2	E420	0.00005	mg/L	<0.000050	----
Silicon, total	7440-21-3	E420	0.1	mg/L	<0.10	----
Silver, total	7440-22-4	E420	0.00001	mg/L	<0.000010	----
Sodium, total	7440-23-5	E420	0.05	mg/L	<0.050	----
Strontium, total	7440-24-6	E420	0.0002	mg/L	<0.00020	----
Sulfur, total	7704-34-9	E420	0.5	mg/L	<0.50	----
Tellurium, total	13494-80-9	E420	0.0002	mg/L	<0.00020	----
Thallium, total	7440-28-0	E420	0.00001	mg/L	<0.000010	----
Thorium, total	7440-29-1	E420	0.0001	mg/L	<0.00010	----
Tin, total	7440-31-5	E420	0.0001	mg/L	<0.00010	----
Titanium, total	7440-32-6	E420	0.0003	mg/L	<0.00030	----
Tungsten, total	7440-33-7	E420	0.0001	mg/L	<0.00010	----
Uranium, total	7440-61-1	E420	0.00001	mg/L	<0.000010	----
Vanadium, total	7440-62-2	E420	0.0005	mg/L	<0.00050	----
Zinc, total	7440-66-6	E420	0.003	mg/L	<0.0030	----
Zirconium, total	7440-67-7	E420	0.0002	mg/L	<0.00020	----
<b>Dissolved Metals (QCLot: 1110359)</b>						
Aluminum, dissolved	7429-90-5	E421	0.001	mg/L	<0.0010	----
Antimony, dissolved	7440-36-0	E421	0.0001	mg/L	<0.00010	----
Arsenic, dissolved	7440-38-2	E421	0.0001	mg/L	<0.00010	----





Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
<b>Dissolved Metals (QCLot: 1110359) - continued</b>						
Barium, dissolved	7440-39-3	E421	0.0001	mg/L	<0.00010	----
Beryllium, dissolved	7440-41-7	E421	0.00002	mg/L	<0.000020	----
Bismuth, dissolved	7440-69-9	E421	0.00005	mg/L	<0.000050	----
Boron, dissolved	7440-42-8	E421	0.01	mg/L	<0.010	----
Cadmium, dissolved	7440-43-9	E421	0.000005	mg/L	<0.0000050	----
Calcium, dissolved	7440-70-2	E421	0.05	mg/L	<0.050	----
Cesium, dissolved	7440-46-2	E421	0.00001	mg/L	<0.000010	----
Chromium, dissolved	7440-47-3	E421	0.0005	mg/L	<0.00050	----
Cobalt, dissolved	7440-48-4	E421	0.0001	mg/L	<0.00010	----
Copper, dissolved	7440-50-8	E421	0.0002	mg/L	<0.00020	----
Iron, dissolved	7439-89-6	E421	0.01	mg/L	<0.010	----
Lead, dissolved	7439-92-1	E421	0.00005	mg/L	<0.000050	----
Lithium, dissolved	7439-93-2	E421	0.001	mg/L	<0.0010	----
Magnesium, dissolved	7439-95-4	E421	0.005	mg/L	<0.0050	----
Manganese, dissolved	7439-96-5	E421	0.0001	mg/L	<0.00010	----
Molybdenum, dissolved	7439-98-7	E421	0.00005	mg/L	<0.000050	----
Nickel, dissolved	7440-02-0	E421	0.0005	mg/L	<0.00050	----
Phosphorus, dissolved	7723-14-0	E421	0.05	mg/L	<0.050	----
Potassium, dissolved	7440-09-7	E421	0.05	mg/L	<0.050	----
Rubidium, dissolved	7440-17-7	E421	0.0002	mg/L	<0.00020	----
Selenium, dissolved	7782-49-2	E421	0.00005	mg/L	<0.000050	----
Silicon, dissolved	7440-21-3	E421	0.05	mg/L	<0.050	----
Silver, dissolved	7440-22-4	E421	0.00001	mg/L	<0.000010	----
Sodium, dissolved	7440-23-5	E421	0.05	mg/L	<0.050	----
Strontium, dissolved	7440-24-6	E421	0.0002	mg/L	<0.00020	----
Sulfur, dissolved	7704-34-9	E421	0.5	mg/L	<0.50	----
Tellurium, dissolved	13494-80-9	E421	0.0002	mg/L	<0.00020	----
Thallium, dissolved	7440-28-0	E421	0.00001	mg/L	<0.000010	----
Thorium, dissolved	7440-29-1	E421	0.0001	mg/L	<0.00010	----
Tin, dissolved	7440-31-5	E421	0.0001	mg/L	<0.00010	----
Titanium, dissolved	7440-32-6	E421	0.0003	mg/L	<0.00030	----
Tungsten, dissolved	7440-33-7	E421	0.0001	mg/L	<0.00010	----
Uranium, dissolved	7440-61-1	E421	0.00001	mg/L	<0.000010	----
Vanadium, dissolved	7440-62-2	E421	0.0005	mg/L	<0.00050	----
Zinc, dissolved	7440-66-6	E421	0.001	mg/L	<0.0010	----



Sub-Matrix: Water

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Dissolved Metals (QCLot: 1110359) - continued						
Zirconium, dissolved	7440-67-7	E421	0.0002	mg/L	<0.00020	----
Dissolved Metals (QCLot: 1111542)						
Aluminum, dissolved	7429-90-5	E421	0.001	mg/L	<0.0010	----
Antimony, dissolved	7440-36-0	E421	0.0001	mg/L	<0.00010	----
Arsenic, dissolved	7440-38-2	E421	0.0001	mg/L	<0.00010	----
Barium, dissolved	7440-39-3	E421	0.0001	mg/L	<0.00010	----
Beryllium, dissolved	7440-41-7	E421	0.00002	mg/L	<0.000020	----
Bismuth, dissolved	7440-69-9	E421	0.00005	mg/L	<0.000050	----
Boron, dissolved	7440-42-8	E421	0.01	mg/L	<0.010	----
Cadmium, dissolved	7440-43-9	E421	0.000005	mg/L	<0.0000050	----
Calcium, dissolved	7440-70-2	E421	0.05	mg/L	<0.050	----
Cesium, dissolved	7440-46-2	E421	0.00001	mg/L	<0.000010	----
Chromium, dissolved	7440-47-3	E421	0.0005	mg/L	<0.00050	----
Cobalt, dissolved	7440-48-4	E421	0.0001	mg/L	<0.00010	----
Copper, dissolved	7440-50-8	E421	0.0002	mg/L	<0.00020	----
Iron, dissolved	7439-89-6	E421	0.01	mg/L	<0.010	----
Lead, dissolved	7439-92-1	E421	0.00005	mg/L	<0.000050	----
Lithium, dissolved	7439-93-2	E421	0.001	mg/L	<0.0010	----
Magnesium, dissolved	7439-95-4	E421	0.005	mg/L	<0.0050	----
Manganese, dissolved	7439-96-5	E421	0.0001	mg/L	<0.00010	----
Molybdenum, dissolved	7439-98-7	E421	0.00005	mg/L	<0.000050	----
Nickel, dissolved	7440-02-0	E421	0.0005	mg/L	<0.00050	----
Phosphorus, dissolved	7723-14-0	E421	0.05	mg/L	<0.050	----
Potassium, dissolved	7440-09-7	E421	0.05	mg/L	<0.050	----
Rubidium, dissolved	7440-17-7	E421	0.0002	mg/L	<0.00020	----
Selenium, dissolved	7782-49-2	E421	0.00005	mg/L	<0.000050	----
Silicon, dissolved	7440-21-3	E421	0.05	mg/L	<0.050	----
Silver, dissolved	7440-22-4	E421	0.00001	mg/L	<0.000010	----
Sodium, dissolved	7440-23-5	E421	0.05	mg/L	<0.050	----
Strontium, dissolved	7440-24-6	E421	0.0002	mg/L	<0.00020	----
Sulfur, dissolved	7704-34-9	E421	0.5	mg/L	<0.50	----
Tellurium, dissolved	13494-80-9	E421	0.0002	mg/L	<0.00020	----
Thallium, dissolved	7440-28-0	E421	0.00001	mg/L	<0.000010	----
Thorium, dissolved	7440-29-1	E421	0.0001	mg/L	<0.00010	----
Tin, dissolved	7440-31-5	E421	0.0001	mg/L	<0.00010	----



Sub-Matrix: Water

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Dissolved Metals (QCLot: 1111542) - continued						
Titanium, dissolved	7440-32-6	E421	0.0003	mg/L	<0.00030	----
Tungsten, dissolved	7440-33-7	E421	0.0001	mg/L	<0.00010	----
Uranium, dissolved	7440-61-1	E421	0.00001	mg/L	<0.000010	----
Vanadium, dissolved	7440-62-2	E421	0.0005	mg/L	<0.00050	----
Zinc, dissolved	7440-66-6	E421	0.001	mg/L	<0.0010	----
Zirconium, dissolved	7440-67-7	E421	0.0002	mg/L	<0.00020	----
Plant Pigments (QCLot: 1113669)						
Chlorophyll a	479-61-8	E870A	0.002	µg/sample	<0.0020	----



Laboratory Control Sample (LCS) Report

A Laboratory Control Sample (LCS) is an analyte-free matrix that has been fortified (spiked) with test analytes at known concentration and processed in an identical manner to test samples. LCS results are expressed as percent recovery, and are used to monitor and control test method accuracy and precision, independent of test sample matrix.

Sub-Matrix: Water

					Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
Analyte	CAS Number	Method	LOR	Unit	Concentration	LCS	Low	High	Qualifier
Physical Tests (QCLot: 1110393)									
Alkalinity, total (as CaCO3)	----	E290	1	mg/L	500 mg/L	108	85.0	115	----
Physical Tests (QCLot: 1114741)									
Solids, total dissolved [TDS]	----	E162	10	mg/L	1000 mg/L	111	85.0	115	----
Anions and Nutrients (QCLot: 1110390)									
Phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.001	mg/L	0.03 mg/L	100	80.0	120	----
Anions and Nutrients (QCLot: 1110395)									
Nitrite (as N)	14797-65-0	E235.NO2-L	0.001	mg/L	0.5 mg/L	100	90.0	110	----
Anions and Nutrients (QCLot: 1110396)									
Nitrate (as N)	14797-55-8	E235.NO3-L	0.005	mg/L	2.5 mg/L	104	90.0	110	----
Anions and Nutrients (QCLot: 1110599)									
Nitrogen, total	7727-37-9	E366	0.03	mg/L	0.5 mg/L	100	75.0	125	----
Anions and Nutrients (QCLot: 1110600)									
Phosphorus, total	7723-14-0	E372-U	0.002	mg/L	0.05 mg/L	92.5	80.0	120	----
Anions and Nutrients (QCLot: 1110601)									
Ammonia, total (as N)	7664-41-7	E298	0.005	mg/L	0.2 mg/L	99.4	85.0	115	----
Anions and Nutrients (QCLot: 1112123)									
Silicate (as SiO2)	7631-86-9	E392	0.5	mg/L	10 mg/L	100	85.0	115	----
Anions and Nutrients (QCLot: 1112592)									
Phosphorus, total dissolved	7723-14-0	E375-T	0.002	mg/L	0.05 mg/L	81.9	80.0	120	----
Anions and Nutrients (QCLot: 1112593)									
Nitrogen, total dissolved	----	E368	0.03	mg/L	0.5 mg/L	94.9	75.0	125	----
Organic / Inorganic Carbon (QCLot: 1112591)									
Carbon, dissolved organic [DOC]	----	E358-L	0.5	mg/L	8.57 mg/L	99.3	80.0	120	----
Total Metals (QCLot: 1111190)									
Aluminum, total	7429-90-5	E420	0.003	mg/L	2 mg/L	99.9	80.0	120	----
Antimony, total	7440-36-0	E420	0.0001	mg/L	1 mg/L	105	80.0	120	----
Arsenic, total	7440-38-2	E420	0.0001	mg/L	1 mg/L	100	80.0	120	----
Barium, total	7440-39-3	E420	0.0001	mg/L	0.25 mg/L	106	80.0	120	----
Beryllium, total	7440-41-7	E420	0.00002	mg/L	0.1 mg/L	103	80.0	120	----



Sub-Matrix: Water					Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		Qualifier
					Concentration	LCS	Low	High	
Analyte	CAS Number	Method	LOR	Unit	Concentration	LCS	Low	High	Qualifier
Total Metals (QCLot: 1111190) - continued									
Bismuth, total	7440-69-9	E420	0.00005	mg/L	1 mg/L	103	80.0	120	----
Boron, total	7440-42-8	E420	0.01	mg/L	1 mg/L	101	80.0	120	----
Cadmium, total	7440-43-9	E420	0.000005	mg/L	0.1 mg/L	101	80.0	120	----
Calcium, total	7440-70-2	E420	0.05	mg/L	50 mg/L	99.3	80.0	120	----
Cesium, total	7440-46-2	E420	0.00001	mg/L	0.05 mg/L	103	80.0	120	----
Chromium, total	7440-47-3	E420	0.0005	mg/L	0.25 mg/L	100	80.0	120	----
Cobalt, total	7440-48-4	E420	0.0001	mg/L	0.25 mg/L	98.6	80.0	120	----
Copper, total	7440-50-8	E420	0.0005	mg/L	0.25 mg/L	95.9	80.0	120	----
Iron, total	7439-89-6	E420	0.01	mg/L	1 mg/L	97.7	80.0	120	----
Lead, total	7439-92-1	E420	0.00005	mg/L	0.5 mg/L	103	80.0	120	----
Lithium, total	7439-93-2	E420	0.001	mg/L	0.25 mg/L	102	80.0	120	----
Magnesium, total	7439-95-4	E420	0.005	mg/L	50 mg/L	104	80.0	120	----
Manganese, total	7439-96-5	E420	0.0001	mg/L	0.25 mg/L	99.4	80.0	120	----
Molybdenum, total	7439-98-7	E420	0.00005	mg/L	0.25 mg/L	99.0	80.0	120	----
Nickel, total	7440-02-0	E420	0.0005	mg/L	0.5 mg/L	97.5	80.0	120	----
Phosphorus, total	7723-14-0	E420	0.05	mg/L	10 mg/L	111	80.0	120	----
Potassium, total	7440-09-7	E420	0.05	mg/L	50 mg/L	104	80.0	120	----
Rubidium, total	7440-17-7	E420	0.0002	mg/L	0.1 mg/L	102	80.0	120	----
Selenium, total	7782-49-2	E420	0.00005	mg/L	1 mg/L	100	80.0	120	----
Silicon, total	7440-21-3	E420	0.1	mg/L	10 mg/L	102	80.0	120	----
Silver, total	7440-22-4	E420	0.00001	mg/L	0.1 mg/L	96.4	80.0	120	----
Sodium, total	7440-23-5	E420	0.05	mg/L	50 mg/L	105	80.0	120	----
Strontium, total	7440-24-6	E420	0.0002	mg/L	0.25 mg/L	97.5	80.0	120	----
Sulfur, total	7704-34-9	E420	0.5	mg/L	50 mg/L	95.3	80.0	120	----
Tellurium, total	13494-80-9	E420	0.0002	mg/L	0.1 mg/L	99.8	80.0	120	----
Thallium, total	7440-28-0	E420	0.00001	mg/L	1 mg/L	104	80.0	120	----
Thorium, total	7440-29-1	E420	0.0001	mg/L	0.1 mg/L	105	80.0	120	----
Tin, total	7440-31-5	E420	0.0001	mg/L	0.5 mg/L	99.5	80.0	120	----
Titanium, total	7440-32-6	E420	0.0003	mg/L	0.25 mg/L	94.2	80.0	120	----
Tungsten, total	7440-33-7	E420	0.0001	mg/L	0.1 mg/L	101	80.0	120	----
Uranium, total	7440-61-1	E420	0.00001	mg/L	0.005 mg/L	106	80.0	120	----
Vanadium, total	7440-62-2	E420	0.0005	mg/L	0.5 mg/L	99.2	80.0	120	----
Zinc, total	7440-66-6	E420	0.003	mg/L	0.5 mg/L	99.0	80.0	120	----
Zirconium, total	7440-67-7	E420	0.0002	mg/L	0.1 mg/L	96.4	80.0	120	----
Dissolved Metals (QCLot: 1110359)									



Sub-Matrix: Water					Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		Qualifier
					Concentration	LCS	Low	High	
Analyte	CAS Number	Method	LOR	Unit	Concentration	LCS	Low	High	Qualifier
Dissolved Metals (QCLot: 1110359) - continued									
Aluminum, dissolved	7429-90-5	E421	0.001	mg/L	2 mg/L	94.7	80.0	120	----
Antimony, dissolved	7440-36-0	E421	0.0001	mg/L	1 mg/L	103	80.0	120	----
Arsenic, dissolved	7440-38-2	E421	0.0001	mg/L	1 mg/L	100	80.0	120	----
Barium, dissolved	7440-39-3	E421	0.0001	mg/L	0.25 mg/L	98.4	80.0	120	----
Beryllium, dissolved	7440-41-7	E421	0.00002	mg/L	0.1 mg/L	97.7	80.0	120	----
Bismuth, dissolved	7440-69-9	E421	0.00005	mg/L	1 mg/L	95.2	80.0	120	----
Boron, dissolved	7440-42-8	E421	0.01	mg/L	1 mg/L	95.3	80.0	120	----
Cadmium, dissolved	7440-43-9	E421	0.000005	mg/L	0.1 mg/L	97.4	80.0	120	----
Calcium, dissolved	7440-70-2	E421	0.05	mg/L	50 mg/L	95.4	80.0	120	----
Cesium, dissolved	7440-46-2	E421	0.00001	mg/L	0.05 mg/L	103	80.0	120	----
Chromium, dissolved	7440-47-3	E421	0.0005	mg/L	0.25 mg/L	95.4	80.0	120	----
Cobalt, dissolved	7440-48-4	E421	0.0001	mg/L	0.25 mg/L	95.8	80.0	120	----
Copper, dissolved	7440-50-8	E421	0.0002	mg/L	0.25 mg/L	92.2	80.0	120	----
Iron, dissolved	7439-89-6	E421	0.01	mg/L	1 mg/L	95.4	80.0	120	----
Lead, dissolved	7439-92-1	E421	0.00005	mg/L	0.5 mg/L	94.2	80.0	120	----
Lithium, dissolved	7439-93-2	E421	0.001	mg/L	0.25 mg/L	93.4	80.0	120	----
Magnesium, dissolved	7439-95-4	E421	0.005	mg/L	50 mg/L	93.8	80.0	120	----
Manganese, dissolved	7439-96-5	E421	0.0001	mg/L	0.25 mg/L	95.9	80.0	120	----
Molybdenum, dissolved	7439-98-7	E421	0.00005	mg/L	0.25 mg/L	99.9	80.0	120	----
Nickel, dissolved	7440-02-0	E421	0.0005	mg/L	0.5 mg/L	93.7	80.0	120	----
Phosphorus, dissolved	7723-14-0	E421	0.05	mg/L	10 mg/L	101	80.0	120	----
Potassium, dissolved	7440-09-7	E421	0.05	mg/L	50 mg/L	97.8	80.0	120	----
Rubidium, dissolved	7440-17-7	E421	0.0002	mg/L	0.1 mg/L	98.6	80.0	120	----
Selenium, dissolved	7782-49-2	E421	0.00005	mg/L	1 mg/L	101	80.0	120	----
Silicon, dissolved	7440-21-3	E421	0.05	mg/L	10 mg/L	108	80.0	120	----
Silver, dissolved	7440-22-4	E421	0.00001	mg/L	0.1 mg/L	94.1	80.0	120	----
Sodium, dissolved	7440-23-5	E421	0.05	mg/L	50 mg/L	99.6	80.0	120	----
Strontium, dissolved	7440-24-6	E421	0.0002	mg/L	0.25 mg/L	100	80.0	120	----
Sulfur, dissolved	7704-34-9	E421	0.5	mg/L	50 mg/L	105	80.0	120	----
Tellurium, dissolved	13494-80-9	E421	0.0002	mg/L	0.1 mg/L	97.0	80.0	120	----
Thallium, dissolved	7440-28-0	E421	0.00001	mg/L	1 mg/L	93.3	80.0	120	----
Thorium, dissolved	7440-29-1	E421	0.0001	mg/L	0.1 mg/L	90.6	80.0	120	----
Tin, dissolved	7440-31-5	E421	0.0001	mg/L	0.5 mg/L	96.7	80.0	120	----
Titanium, dissolved	7440-32-6	E421	0.0003	mg/L	0.25 mg/L	95.8	80.0	120	----
Tungsten, dissolved	7440-33-7	E421	0.0001	mg/L	0.1 mg/L	94.2	80.0	120	----
Uranium, dissolved	7440-61-1	E421	0.00001	mg/L	0.005 mg/L	92.8	80.0	120	----



Sub-Matrix: Water					Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		Qualifier
					Concentration	LCS	Low	High	
Analyte	CAS Number	Method	LOR	Unit	Concentration	LCS	Low	High	Qualifier
Dissolved Metals (QCLot: 1110359) - continued									
Vanadium, dissolved	7440-62-2	E421	0.0005	mg/L	0.5 mg/L	95.1	80.0	120	----
Zinc, dissolved	7440-66-6	E421	0.001	mg/L	0.5 mg/L	91.7	80.0	120	----
Zirconium, dissolved	7440-67-7	E421	0.0002	mg/L	0.1 mg/L	95.8	80.0	120	----
Dissolved Metals (QCLot: 1111542)									
Aluminum, dissolved	7429-90-5	E421	0.001	mg/L	2 mg/L	104	80.0	120	----
Antimony, dissolved	7440-36-0	E421	0.0001	mg/L	1 mg/L	107	80.0	120	----
Arsenic, dissolved	7440-38-2	E421	0.0001	mg/L	1 mg/L	106	80.0	120	----
Barium, dissolved	7440-39-3	E421	0.0001	mg/L	0.25 mg/L	107	80.0	120	----
Beryllium, dissolved	7440-41-7	E421	0.00002	mg/L	0.1 mg/L	104	80.0	120	----
Bismuth, dissolved	7440-69-9	E421	0.00005	mg/L	1 mg/L	102	80.0	120	----
Boron, dissolved	7440-42-8	E421	0.01	mg/L	1 mg/L	102	80.0	120	----
Cadmium, dissolved	7440-43-9	E421	0.000005	mg/L	0.1 mg/L	102	80.0	120	----
Calcium, dissolved	7440-70-2	E421	0.05	mg/L	50 mg/L	104	80.0	120	----
Cesium, dissolved	7440-46-2	E421	0.00001	mg/L	0.05 mg/L	106	80.0	120	----
Chromium, dissolved	7440-47-3	E421	0.0005	mg/L	0.25 mg/L	102	80.0	120	----
Cobalt, dissolved	7440-48-4	E421	0.0001	mg/L	0.25 mg/L	104	80.0	120	----
Copper, dissolved	7440-50-8	E421	0.0002	mg/L	0.25 mg/L	100	80.0	120	----
Iron, dissolved	7439-89-6	E421	0.01	mg/L	1 mg/L	104	80.0	120	----
Lead, dissolved	7439-92-1	E421	0.00005	mg/L	0.5 mg/L	99.5	80.0	120	----
Lithium, dissolved	7439-93-2	E421	0.001	mg/L	0.25 mg/L	101	80.0	120	----
Magnesium, dissolved	7439-95-4	E421	0.005	mg/L	50 mg/L	107	80.0	120	----
Manganese, dissolved	7439-96-5	E421	0.0001	mg/L	0.25 mg/L	104	80.0	120	----
Molybdenum, dissolved	7439-98-7	E421	0.00005	mg/L	0.25 mg/L	106	80.0	120	----
Nickel, dissolved	7440-02-0	E421	0.0005	mg/L	0.5 mg/L	101	80.0	120	----
Phosphorus, dissolved	7723-14-0	E421	0.05	mg/L	10 mg/L	115	80.0	120	----
Potassium, dissolved	7440-09-7	E421	0.05	mg/L	50 mg/L	106	80.0	120	----
Rubidium, dissolved	7440-17-7	E421	0.0002	mg/L	0.1 mg/L	105	80.0	120	----
Selenium, dissolved	7782-49-2	E421	0.00005	mg/L	1 mg/L	103	80.0	120	----
Silicon, dissolved	7440-21-3	E421	0.05	mg/L	10 mg/L	111	80.0	120	----
Silver, dissolved	7440-22-4	E421	0.00001	mg/L	0.1 mg/L	97.4	80.0	120	----
Sodium, dissolved	7440-23-5	E421	0.05	mg/L	50 mg/L	107	80.0	120	----
Strontium, dissolved	7440-24-6	E421	0.0002	mg/L	0.25 mg/L	104	80.0	120	----
Sulfur, dissolved	7704-34-9	E421	0.5	mg/L	50 mg/L	108	80.0	120	----
Tellurium, dissolved	13494-80-9	E421	0.0002	mg/L	0.1 mg/L	102	80.0	120	----
Thallium, dissolved	7440-28-0	E421	0.00001	mg/L	1 mg/L	104	80.0	120	----
Thorium, dissolved	7440-29-1	E421	0.0001	mg/L	0.1 mg/L	94.8	80.0	120	----



Sub-Matrix: Water					Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
					Concentration	LCS	Low	High	Qualifier
Analyte	CAS Number	Method	LOR	Unit					
Dissolved Metals (QCLot: 1111542) - continued									
Tin, dissolved	7440-31-5	E421	0.0001	mg/L	0.5 mg/L	103	80.0	120	----
Titanium, dissolved	7440-32-6	E421	0.0003	mg/L	0.25 mg/L	99.4	80.0	120	----
Tungsten, dissolved	7440-33-7	E421	0.0001	mg/L	0.1 mg/L	98.7	80.0	120	----
Uranium, dissolved	7440-61-1	E421	0.00001	mg/L	0.005 mg/L	98.4	80.0	120	----
Vanadium, dissolved	7440-62-2	E421	0.0005	mg/L	0.5 mg/L	105	80.0	120	----
Zinc, dissolved	7440-66-6	E421	0.001	mg/L	0.5 mg/L	98.3	80.0	120	----
Zirconium, dissolved	7440-67-7	E421	0.0002	mg/L	0.1 mg/L	99.2	80.0	120	----
Plant Pigments (QCLot: 1113669)									
Chlorophyll a	479-61-8	E870A	0.002	µg/sample	1 µg/sample	91.7	80.0	120	----





Matrix Spike (MS) Report

A Matrix Spike (MS) is a randomly selected intra-laboratory replicate sample that has been fortified (spiked) with test analytes at known concentration, and processed in an identical manner to test samples. Matrix Spikes provide information regarding analyte recovery and potential matrix effects. MS DQO exceedances due to sample matrix may sometimes be unavoidable; in such cases, test results for the associated sample (or similar samples) may be subject to bias. ND – Recovery not determined, background level >= 1x spike level.

Laboratory sample ID					Matrix Spike (MS) Report					
					Spike		Recovery (%)	Recovery Limits (%)		Qualifier
					Concentration	Target	MS	Low	High	
Client sample ID	Analyte	CAS Number	Method							
Anions and Nutrients (QCLot: 1110390)										
VA23C0122-001	Anonymous	Phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.0292 mg/L	0.03 mg/L	97.4	70.0	130	----
Anions and Nutrients (QCLot: 1110395)										
VA23C0131-002	Anonymous	Nitrite (as N)	14797-65-0	E235.NO2-L	0.503 mg/L	0.5 mg/L	100	75.0	125	----
Anions and Nutrients (QCLot: 1110396)										
VA23C0131-002	Anonymous	Nitrate (as N)	14797-55-8	E235.NO3-L	2.64 mg/L	2.5 mg/L	105	75.0	125	----
Anions and Nutrients (QCLot: 1110599)										
VA23C0167-002	MOR 2D	Nitrogen, total	7727-37-9	E366	0.388 mg/L	0.4 mg/L	97.1	70.0	130	----
Anions and Nutrients (QCLot: 1110600)										
VA23C0167-002	MOR 2D	Phosphorus, total	7723-14-0	E372-U	0.0456 mg/L	0.05 mg/L	91.3	70.0	130	----
Anions and Nutrients (QCLot: 1110601)										
VA23C0167-002	MOR 2D	Ammonia, total (as N)	7664-41-7	E298	0.105 mg/L	0.1 mg/L	105	75.0	125	----
Anions and Nutrients (QCLot: 1112123)										
VA23C0167-001	MOR 1D	Silicate (as SiO2)	7631-86-9	E392	10.2 mg/L	10 mg/L	102	75.0	125	----
Anions and Nutrients (QCLot: 1112592)										
VA23C0167-001	MOR 1D	Phosphorus, total dissolved	7723-14-0	E375-T	0.0426 mg/L	0.05 mg/L	85.1	70.0	130	----
Anions and Nutrients (QCLot: 1112593)										
VA23C0167-002	MOR 2D	Nitrogen, total dissolved	----	E368	0.392 mg/L	0.4 mg/L	98.1	70.0	130	----
Organic / Inorganic Carbon (QCLot: 1112591)										
VA23C0167-001	MOR 1D	Carbon, dissolved organic [DOC]	----	E358-L	5.00 mg/L	5 mg/L	100	70.0	130	----
Total Metals (QCLot: 1111190)										
VA23C0167-002	MOR 2D	Aluminum, total	7429-90-5	E420	0.194 mg/L	0.2 mg/L	97.1	70.0	130	----
		Antimony, total	7440-36-0	E420	0.0189 mg/L	0.02 mg/L	94.4	70.0	130	----
		Arsenic, total	7440-38-2	E420	0.0193 mg/L	0.02 mg/L	96.4	70.0	130	----
		Barium, total	7440-39-3	E420	0.0210 mg/L	0.02 mg/L	105	70.0	130	----
		Beryllium, total	7440-41-7	E420	0.0388 mg/L	0.04 mg/L	96.9	70.0	130	----
		Bismuth, total	7440-69-9	E420	0.0103 mg/L	0.01 mg/L	103	70.0	130	----
		Boron, total	7440-42-8	E420	0.097 mg/L	0.1 mg/L	97.3	70.0	130	----
		Cadmium, total	7440-43-9	E420	0.00401 mg/L	0.004 mg/L	100	70.0	130	----



Sub-Matrix: Water					Matrix Spike (MS) Report					
					Spike		Recovery (%)	Recovery Limits (%)		
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	Concentration	Target	MS	Low	High	Qualifier
Total Metals (QCLot: 1111190) - continued										
VA23C0167-002	MOR 2D	Calcium, total	7440-70-2	E420	ND mg/L	4 mg/L	ND	70.0	130	----
		Cesium, total	7440-46-2	E420	0.00983 mg/L	0.01 mg/L	98.3	70.0	130	----
		Chromium, total	7440-47-3	E420	0.0400 mg/L	0.04 mg/L	100	70.0	130	----
		Cobalt, total	7440-48-4	E420	0.0198 mg/L	0.02 mg/L	98.8	70.0	130	----
		Copper, total	7440-50-8	E420	0.0193 mg/L	0.02 mg/L	96.7	70.0	130	----
		Iron, total	7439-89-6	E420	1.92 mg/L	2 mg/L	96.1	70.0	130	----
		Lead, total	7439-92-1	E420	0.0197 mg/L	0.02 mg/L	98.6	70.0	130	----
		Lithium, total	7439-93-2	E420	0.0986 mg/L	0.1 mg/L	98.6	70.0	130	----
		Magnesium, total	7439-95-4	E420	0.985 mg/L	1 mg/L	98.5	70.0	130	----
		Manganese, total	7439-96-5	E420	0.0194 mg/L	0.02 mg/L	97.2	70.0	130	----
		Molybdenum, total	7439-98-7	E420	0.0190 mg/L	0.02 mg/L	95.1	70.0	130	----
		Nickel, total	7440-02-0	E420	0.0394 mg/L	0.04 mg/L	98.4	70.0	130	----
		Phosphorus, total	7723-14-0	E420	9.87 mg/L	10 mg/L	98.7	70.0	130	----
		Potassium, total	7440-09-7	E420	3.91 mg/L	4 mg/L	97.8	70.0	130	----
		Rubidium, total	7440-17-7	E420	0.0189 mg/L	0.02 mg/L	94.5	70.0	130	----
		Selenium, total	7782-49-2	E420	0.0398 mg/L	0.04 mg/L	99.6	70.0	130	----
		Silicon, total	7440-21-3	E420	9.36 mg/L	10 mg/L	93.6	70.0	130	----
		Silver, total	7440-22-4	E420	0.00384 mg/L	0.004 mg/L	96.0	70.0	130	----
		Sodium, total	7440-23-5	E420	2.01 mg/L	2 mg/L	101	70.0	130	----
		Strontium, total	7440-24-6	E420	ND mg/L	0.02 mg/L	ND	70.0	130	----
		Sulfur, total	7704-34-9	E420	19.2 mg/L	20 mg/L	95.8	70.0	130	----
		Tellurium, total	13494-80-9	E420	0.0383 mg/L	0.04 mg/L	95.7	70.0	130	----
		Thallium, total	7440-28-0	E420	0.00387 mg/L	0.004 mg/L	96.7	70.0	130	----
		Thorium, total	7440-29-1	E420	0.0210 mg/L	0.02 mg/L	105	70.0	130	----
		Tin, total	7440-31-5	E420	0.0192 mg/L	0.02 mg/L	96.0	70.0	130	----
		Titanium, total	7440-32-6	E420	0.0380 mg/L	0.04 mg/L	95.0	70.0	130	----
		Tungsten, total	7440-33-7	E420	0.0191 mg/L	0.02 mg/L	95.6	70.0	130	----
		Uranium, total	7440-61-1	E420	0.00392 mg/L	0.004 mg/L	97.9	70.0	130	----
		Vanadium, total	7440-62-2	E420	0.0968 mg/L	0.1 mg/L	96.8	70.0	130	----
		Zinc, total	7440-66-6	E420	0.394 mg/L	0.4 mg/L	98.4	70.0	130	----
		Zirconium, total	7440-67-7	E420	0.0398 mg/L	0.04 mg/L	99.4	70.0	130	----
Dissolved Metals (QCLot: 1110359)										
VA23C0167-005	MOR 2S	Aluminum, dissolved	7429-90-5	E421	0.190 mg/L	0.2 mg/L	95.3	70.0	130	----
		Antimony, dissolved	7440-36-0	E421	0.0195 mg/L	0.02 mg/L	97.6	70.0	130	----
		Arsenic, dissolved	7440-38-2	E421	0.0193 mg/L	0.02 mg/L	96.7	70.0	130	----



Sub-Matrix: Water					Matrix Spike (MS) Report					
					Spike		Recovery (%)	Recovery Limits (%)		
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	Concentration	Target	MS	Low	High	Qualifier
Dissolved Metals (QCLot: 1110359) - continued										
VA23C0167-005	MOR 2S	Barium, dissolved	7440-39-3	E421	0.0187 mg/L	0.02 mg/L	93.6	70.0	130	----
		Beryllium, dissolved	7440-41-7	E421	0.0382 mg/L	0.04 mg/L	95.5	70.0	130	----
		Bismuth, dissolved	7440-69-9	E421	0.00906 mg/L	0.01 mg/L	90.6	70.0	130	----
		Boron, dissolved	7440-42-8	E421	0.095 mg/L	0.1 mg/L	95.1	70.0	130	----
		Cadmium, dissolved	7440-43-9	E421	0.00397 mg/L	0.004 mg/L	99.2	70.0	130	----
		Calcium, dissolved	7440-70-2	E421	ND mg/L	4 mg/L	ND	70.0	130	----
		Cesium, dissolved	7440-46-2	E421	0.0102 mg/L	0.01 mg/L	102	70.0	130	----
		Chromium, dissolved	7440-47-3	E421	0.0386 mg/L	0.04 mg/L	96.5	70.0	130	----
		Cobalt, dissolved	7440-48-4	E421	0.0193 mg/L	0.02 mg/L	96.7	70.0	130	----
		Copper, dissolved	7440-50-8	E421	0.0190 mg/L	0.02 mg/L	95.3	70.0	130	----
		Iron, dissolved	7439-89-6	E421	1.89 mg/L	2 mg/L	94.4	70.0	130	----
		Lead, dissolved	7439-92-1	E421	0.0192 mg/L	0.02 mg/L	95.9	70.0	130	----
		Lithium, dissolved	7439-93-2	E421	0.0940 mg/L	0.1 mg/L	94.0	70.0	130	----
		Magnesium, dissolved	7439-95-4	E421	0.918 mg/L	1 mg/L	91.8	70.0	130	----
		Manganese, dissolved	7439-96-5	E421	0.0194 mg/L	0.02 mg/L	96.8	70.0	130	----
		Molybdenum, dissolved	7439-98-7	E421	0.0196 mg/L	0.02 mg/L	97.8	70.0	130	----
		Nickel, dissolved	7440-02-0	E421	0.0383 mg/L	0.04 mg/L	95.8	70.0	130	----
		Phosphorus, dissolved	7723-14-0	E421	9.67 mg/L	10 mg/L	96.7	70.0	130	----
		Potassium, dissolved	7440-09-7	E421	3.93 mg/L	4 mg/L	98.4	70.0	130	----
		Rubidium, dissolved	7440-17-7	E421	0.0193 mg/L	0.02 mg/L	96.3	70.0	130	----
		Selenium, dissolved	7782-49-2	E421	0.0398 mg/L	0.04 mg/L	99.5	70.0	130	----
		Silicon, dissolved	7440-21-3	E421	9.92 mg/L	10 mg/L	99.2	70.0	130	----
		Silver, dissolved	7440-22-4	E421	0.00390 mg/L	0.004 mg/L	97.6	70.0	130	----
		Sodium, dissolved	7440-23-5	E421	2.02 mg/L	2 mg/L	101	70.0	130	----
		Strontium, dissolved	7440-24-6	E421	ND mg/L	0.02 mg/L	ND	70.0	130	----
		Sulfur, dissolved	7704-34-9	E421	19.7 mg/L	20 mg/L	98.3	70.0	130	----
		Tellurium, dissolved	13494-80-9	E421	0.0401 mg/L	0.04 mg/L	100	70.0	130	----
		Thallium, dissolved	7440-28-0	E421	0.00370 mg/L	0.004 mg/L	92.6	70.0	130	----
		Thorium, dissolved	7440-29-1	E421	0.0207 mg/L	0.02 mg/L	104	70.0	130	----
		Tin, dissolved	7440-31-5	E421	0.0192 mg/L	0.02 mg/L	96.0	70.0	130	----
		Titanium, dissolved	7440-32-6	E421	0.0383 mg/L	0.04 mg/L	95.7	70.0	130	----
		Tungsten, dissolved	7440-33-7	E421	0.0186 mg/L	0.02 mg/L	93.1	70.0	130	----
		Uranium, dissolved	7440-61-1	E421	0.00382 mg/L	0.004 mg/L	95.6	70.0	130	----
		Vanadium, dissolved	7440-62-2	E421	0.0959 mg/L	0.1 mg/L	95.9	70.0	130	----
		Zinc, dissolved	7440-66-6	E421	0.377 mg/L	0.4 mg/L	94.3	70.0	130	----



Sub-Matrix: Water					Matrix Spike (MS) Report					
					Spike		Recovery (%)	Recovery Limits (%)		
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	Concentration	Target	MS	Low	High	Qualifier
Dissolved Metals (QCLot: 1110359) - continued										
VA23C0167-005	MOR 2S	Zirconium, dissolved	7440-67-7	E421	0.0410 mg/L	0.04 mg/L	102	70.0	130	----
Dissolved Metals (QCLot: 1111542)										
FJ2302146-002	Anonymous	Aluminum, dissolved	7429-90-5	E421	0.186 mg/L	0.2 mg/L	93.2	70.0	130	----
		Antimony, dissolved	7440-36-0	E421	0.0186 mg/L	0.02 mg/L	93.0	70.0	130	----
		Arsenic, dissolved	7440-38-2	E421	0.0191 mg/L	0.02 mg/L	95.3	70.0	130	----
		Barium, dissolved	7440-39-3	E421	ND mg/L	0.02 mg/L	ND	70.0	130	----
		Beryllium, dissolved	7440-41-7	E421	0.0350 mg/L	0.04 mg/L	87.6	70.0	130	----
		Bismuth, dissolved	7440-69-9	E421	0.00781 mg/L	0.01 mg/L	78.1	70.0	130	----
		Boron, dissolved	7440-42-8	E421	0.083 mg/L	0.1 mg/L	83.0	70.0	130	----
		Cadmium, dissolved	7440-43-9	E421	0.00376 mg/L	0.004 mg/L	94.0	70.0	130	----
		Calcium, dissolved	7440-70-2	E421	ND mg/L	4 mg/L	ND	70.0	130	----
		Cesium, dissolved	7440-46-2	E421	0.00995 mg/L	0.01 mg/L	99.5	70.0	130	----
		Chromium, dissolved	7440-47-3	E421	0.0376 mg/L	0.04 mg/L	94.1	70.0	130	----
		Cobalt, dissolved	7440-48-4	E421	0.0183 mg/L	0.02 mg/L	91.7	70.0	130	----
		Copper, dissolved	7440-50-8	E421	0.0173 mg/L	0.02 mg/L	86.7	70.0	130	----
		Iron, dissolved	7439-89-6	E421	1.85 mg/L	2 mg/L	92.5	70.0	130	----
		Lead, dissolved	7439-92-1	E421	0.0176 mg/L	0.02 mg/L	87.8	70.0	130	----
		Lithium, dissolved	7439-93-2	E421	0.0810 mg/L	0.1 mg/L	81.0	70.0	130	----
		Magnesium, dissolved	7439-95-4	E421	ND mg/L	1 mg/L	ND	70.0	130	----
		Manganese, dissolved	7439-96-5	E421	0.0186 mg/L	0.02 mg/L	93.2	70.0	130	----
		Molybdenum, dissolved	7439-98-7	E421	0.0190 mg/L	0.02 mg/L	94.9	70.0	130	----
		Nickel, dissolved	7440-02-0	E421	0.0352 mg/L	0.04 mg/L	88.0	70.0	130	----
		Phosphorus, dissolved	7723-14-0	E421	10.4 mg/L	10 mg/L	104	70.0	130	----
		Potassium, dissolved	7440-09-7	E421	3.77 mg/L	4 mg/L	94.2	70.0	130	----
		Rubidium, dissolved	7440-17-7	E421	0.0189 mg/L	0.02 mg/L	94.7	70.0	130	----
		Selenium, dissolved	7782-49-2	E421	0.0400 mg/L	0.04 mg/L	100	70.0	130	----
		Silicon, dissolved	7440-21-3	E421	9.51 mg/L	10 mg/L	95.1	70.0	130	----
		Silver, dissolved	7440-22-4	E421	0.00361 mg/L	0.004 mg/L	90.2	70.0	130	----
		Sodium, dissolved	7440-23-5	E421	ND mg/L	2 mg/L	ND	70.0	130	----
		Strontium, dissolved	7440-24-6	E421	ND mg/L	0.02 mg/L	ND	70.0	130	----
		Sulfur, dissolved	7704-34-9	E421	ND mg/L	20 mg/L	ND	70.0	130	----
		Tellurium, dissolved	13494-80-9	E421	0.0376 mg/L	0.04 mg/L	93.9	70.0	130	----
		Thallium, dissolved	7440-28-0	E421	0.00349 mg/L	0.004 mg/L	87.2	70.0	130	----
		Thorium, dissolved	7440-29-1	E421	0.0195 mg/L	0.02 mg/L	97.5	70.0	130	----
				Tin, dissolved	7440-31-5	E421	0.0187 mg/L	0.02 mg/L	93.7	70.0



Sub-Matrix: Water					Matrix Spike (MS) Report					
					Spike		Recovery (%)	Recovery Limits (%)		
					Concentration	Target	MS	Low	High	Qualifier
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method						
Dissolved Metals (QCLot: 1111542) - continued										
FJ2302146-002	Anonymous	Titanium, dissolved	7440-32-6	E421	0.0377 mg/L	0.04 mg/L	94.2	70.0	130	----
		Tungsten, dissolved	7440-33-7	E421	0.0181 mg/L	0.02 mg/L	90.3	70.0	130	----
		Uranium, dissolved	7440-61-1	E421	ND mg/L	0.004 mg/L	ND	70.0	130	----
		Vanadium, dissolved	7440-62-2	E421	0.0967 mg/L	0.1 mg/L	96.7	70.0	130	----
		Zinc, dissolved	7440-66-6	E421	0.347 mg/L	0.4 mg/L	86.9	70.0	130	----
		Zirconium, dissolved	7440-67-7	E421	0.0397 mg/L	0.04 mg/L	99.2	70.0	130	----



COC Number: 20 - 1014750

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<b>Report To</b>			<b>Turnaround Time (TAT) Requested</b>			<b>Analysis Request</b>		
<b>Company:</b> Northwest Research and Monitoring			<b>Reports / Recipients</b>					
<b>Contact:</b> Laura Guillon			<b>Select Report Format:</b> <input checked="" type="checkbox"/> PDF <input checked="" type="checkbox"/> EXCEL <input type="checkbox"/> EDD (DIGITAL)			<b>For all tests with rush TATs requested, please contact your AM to confirm availability.</b>		
<b>Phone:</b> 250 877 7858			<b>Merge QC/QCI Reports with COA</b> <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO <input type="checkbox"/> N/A					
<b>Street:</b> PO Box 4357			<b>Select Distribution:</b> <input checked="" type="checkbox"/> EMAIL <input type="checkbox"/> MAIL <input type="checkbox"/> FAX			<b>Analysis Request</b>		
<b>City/Province:</b> Smithers BC			<b>Email 1 or Fax:</b> laura.guillon@nwrn.ca					
<b>Postal Code:</b> V0J 2N0			<b>Email 2:</b> info@nwrn.ca			<b>Analysis Request</b>		
<b>Invoice To:</b> Same as Report To <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO			<b>Invoice Recipients</b>					
<b>Copy of Invoice with Report:</b> <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO			<b>Select Invoice Distribution:</b> <input checked="" type="checkbox"/> EMAIL <input type="checkbox"/> MAIL <input type="checkbox"/> FAX			<b>Analysis Request</b>		
<b>Company:</b>			<b>Email 1 or Fax:</b> invoices@nwrn.ca					
<b>Contact:</b>			<b>Email 2:</b>			<b>Analysis Request</b>		
<b>Project Information</b>			<b>Oil and Gas Required Fields (client use)</b>					
<b>ALS Account # / Quote #:</b> VA 2020NWRM100001			<b>AFE/Cost Center:</b>			<b>Analysis Request</b>		
<b>Job #:</b> MWMT 2023 - Morice Lake			<b>Major/Minor Code:</b>					
<b>PO / AFE:</b>			<b>Requisitioner:</b>			<b>Analysis Request</b>		
<b>LSD:</b>			<b>Location:</b>					
<b>ALS Lab Work Order # (ALS use only):</b>			<b>ALS Contact:</b>			<b>Analysis Request</b>		
<b>ALS Sample # (ALS use only):</b>			<b>Sampler:</b>					
<b>Sample Identification and/or Coordinates</b>			<b>Date</b>			<b>Analysis Request</b>		
<b>(This description will appear on the report)</b>			<b>(dd-mm-yy)</b>					
<b>MOR 1D</b>			<b>28-Aug-23</b>			<b>Analysis Request</b>		
<b>MOR 2D</b>			<b>9:10</b>					
<b>MOR 3D</b>			<b>7:30</b>			<b>Analysis Request</b>		
<b>MOR 1S</b>			<b>6:15</b>					
<b>MOR 2S</b>			<b>9:10</b>			<b>Analysis Request</b>		
<b>MOR 3S</b>			<b>7:30</b>					
<b>Field Blank</b>			<b>6:15</b>			<b>Analysis Request</b>		
<b>Travel Blank</b>			<b>6:15</b>					
<b>Environmental Division</b>			<b>Telephone: +1 604 253 4188</b>			<b>Analysis Request</b>		
<b>Vancouver</b>			<b>Work Order Reference</b>					
<b>VA23C0167</b>			<b>Barcode</b>			<b>Analysis Request</b>		
<b>Barcode</b>			<b>Barcode</b>					
<b>Drinking Water (DW) Samples (client use)</b>			<b>Notes / Specify Limits for result evaluation by selecting from drop-down below (Excel COC only)</b>			<b>Analysis Request</b>		
<b>Are samples taken from a Regulated DW System?</b>			<b>Trace sample analysis (lowest LOD) for all nutrients</b>					
<b>Are samples for human consumption/ use?</b>			<b>Barcode</b>			<b>Analysis Request</b>		
<b>Barcode</b>			<b>Barcode</b>					
<b>SHIPMENT RELEASE (client use)</b>			<b>INITIAL SHIPMENT RECEPTION (ALS use only)</b>			<b>Analysis Request</b>		
<b>Released by:</b> Laura			<b>Received by:</b>					
<b>Date:</b> 28-Aug-2023			<b>Date:</b>			<b>Analysis Request</b>		
<b>Time:</b> 6:00			<b>Time:</b>					
<b>SHIPMENT RELEASE (client use)</b>			<b>INITIAL SHIPMENT RECEPTION (ALS use only)</b>			<b>Analysis Request</b>		
<b>Released by:</b> Laura			<b>Received by:</b>					
<b>Date:</b> 28-Aug-2023			<b>Date:</b>			<b>Analysis Request</b>		
<b>Time:</b> 6:00			<b>Time:</b>					
<b>SHIPMENT RELEASE (client use)</b>			<b>INITIAL SHIPMENT RECEPTION (ALS use only)</b>			<b>Analysis Request</b>		
<b>Released by:</b> Laura			<b>Received by:</b>					
<b>Date:</b> 28-Aug-2023			<b>Date:</b>			<b>Analysis Request</b>		
<b>Time:</b> 6:00			<b>Time:</b>					
<b>SHIPMENT RELEASE (client use)</b>			<b>INITIAL SHIPMENT RECEPTION (ALS use only)</b>			<b>Analysis Request</b>		
<b>Released by:</b> Laura			<b>Received by:</b>					
<b>Date:</b> 28-Aug-2023			<b>Date:</b>			<b>Analysis Request</b>		
<b>Time:</b> 6:00			<b>Time:</b>					
<b>SHIPMENT RELEASE (client use)</b>			<b>INITIAL SHIPMENT RECEPTION (ALS use only)</b>			<b>Analysis Request</b>		
<b>Released by:</b> Laura			<b>Received by:</b>					
<b>Date:</b> 28-Aug-2023			<b>Date:</b>			<b>Analysis Request</b>		
<b>Time:</b> 6:00			<b>Time:</b>					
<b>SHIPMENT RELEASE (client use)</b>			<b>INITIAL SHIPMENT RECEPTION (ALS use only)</b>			<b>Analysis Request</b>		
<b>Released by:</b> Laura			<b>Received by:</b>					
<b>Date:</b> 28-Aug-2023			<b>Date:</b>			<b>Analysis Request</b>		
<b>Time:</b> 6:00			<b>Time:</b>					
<b>SHIPMENT RELEASE (client use)</b>			<b>INITIAL SHIPMENT RECEPTION (ALS use only)</b>			<b>Analysis Request</b>		
<b>Released by:</b> Laura			<b>Received by:</b>					
<b>Date:</b> 28-Aug-2023			<b>Date:</b>			<b>Analysis Request</b>		
<b>Time:</b> 6:00			<b>Time:</b>					
<b>SHIPMENT RELEASE (client use)</b>			<b>INITIAL SHIPMENT RECEPTION (ALS use only)</b>			<b>Analysis Request</b>		
<b>Released by:</b> Laura			<b>Received by:</b>					
<b>Date:</b> 28-Aug-2023			<b>Date:</b>			<b>Analysis Request</b>		
<b>Time:</b> 6:00			<b>Time:</b>					
<b>SHIPMENT RELEASE (client use)</b>			<b>INITIAL SHIPMENT RECEPTION (ALS use only)</b>			<b>Analysis Request</b>		
<b>Released by:</b> Laura			<b>Received by:</b>					
<b>Date:</b> 28-Aug-2023			<b>Date:</b>			<b>Analysis Request</b>		
<b>Time:</b> 6:00			<b>Time:</b>					
<b>SHIPMENT RELEASE (client use)</b>			<b>INITIAL SHIPMENT RECEPTION (ALS use only)</b>			<b>Analysis Request</b>		
<b>Released by:</b> Laura			<b>Received by:</b>					
<b>Date:</b> 28-Aug-2023			<b>Date:</b>			<b>Analysis Request</b>		
<b>Time:</b> 6:00			<b>Time:</b>					
<b>SHIPMENT RELEASE (client use)</b>			<b>INITIAL SHIPMENT RECEPTION (ALS use only)</b>			<b>Analysis Request</b>		
<b>Released by:</b> Laura			<b>Received by:</b>					
<b>Date:</b> 28-Aug-2023			<b>Date:</b>			<b>Analysis Request</b>		
<b>Time:</b> 6:00			<b>Time:</b>					
<b>SHIPMENT RELEASE (client use)</b>			<b>INITIAL SHIPMENT RECEPTION (ALS use only)</b>			<b>Analysis Request</b>		
<b>Released by:</b> Laura			<b>Received by:</b>					
<b>Date:</b> 28-Aug-2023			<b>Date:</b> </					

REFER TO BACK PAGE FOR AIS LOCATIONS AND SAMPLING INFORMATION

WHITE - LABORATORY COPY      YELLOW - CLIENT COPY

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 specified on the back page of the white - report copy.

1. If any water samples are taken from a **Regulated Drinking Water (DW) System**, please submit using an **Authorized PW COC form**.

AUG 4 20 50 PM '64