



CERTIFICATE OF ANALYSIS

<p>Work Order : FC2300954</p> <p>Client : Regional Municipality of Wood Buffalo</p> <p>Contact : Water Treatment Plant</p> <p>Address : 1 Silin Forest Road Fort McMurray AB Canada T9H 5A1</p> <p>Telephone : 780-762-5863</p> <p>Project : Fort Chipewyan Imperial Release</p> <p>PO : 4500049712</p> <p>C-O-C number : ----</p> <p>Sampler : DM</p> <p>Site :</p> <p>Quote number : Q61323 (Fort chip)</p> <p>No. of samples received : 1</p> <p>No. of samples analysed : 1</p>	<p>Page : 1 of 8</p> <p>Laboratory : Fort McMurray - Environmental</p> <p>Account Manager : Megan Trydal</p> <p>Address : #4, 340 Macalpine Crescent Fort McMurray AB Canada T9H 4A8</p> <p>Telephone : +1 780 791 1524</p> <p>Date Samples Received : 21-Apr-2023 08:34</p> <p>Date Analysis Commenced : 21-Apr-2023</p> <p>Issue Date : 25-Apr-2023 09:51</p>
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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
- Surrogate Control Limits

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.

<i>Signatories</i>	<i>Position</i>	<i>Laboratory Department</i>
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Cindy Tang	Team Leader - Inorganics	Inorganics, Burnaby, British Columbia
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Remy Gatabazi	Lab Analyst	Organics, Edmonton, Alberta
Shruti Mudliar	Lab Analyst	Inorganics, Edmonton, Alberta



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
%	percent
µg/L	micrograms per litre
µS/cm	microsiemens per centimetre
meq/L	milliequivalents per litre
mg/L	milligrams per litre
pH units	pH units
psu	practical salinity units

<: 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
DTSE	Dissolved Se concentration exceeds total. Positive bias on D-Se suspected due to signal enhancement from volatile selenium species. Contact ALS if an alternative test to address this interference is needed.



Analytical Results

Sub-Matrix: Water					Client sample ID	Raw Water-Lake Intake	---	---	---	---
(Matrix: Water)					Client sampling date / time	20-Apr-2023	---	---	---	---
Analyte	CAS Number	Method	LOR	Unit	FC2300954-001	-----	-----	-----	-----	
					Result	---	---	---	---	
Physical Tests										
Hardness (as CaCO3), dissolved	----	EC100	0.50	mg/L	37.4	---	---	---	---	
Salinity	----	EC100S	1.0	psu	<1.0	---	---	---	---	
Conductivity	----	E100	2.0	µS/cm	91.5	---	---	---	---	
pH	----	E108	0.10	pH units	7.67	---	---	---	---	
Alkalinity, bicarbonate (as HCO3)	71-52-3	E290	1.0	mg/L	41.1	---	---	---	---	
Alkalinity, carbonate (as CO3)	3812-32-6	E290	1.0	mg/L	<1.0	---	---	---	---	
Alkalinity, hydroxide (as OH)	14280-30-9	E290	1.0	mg/L	<1.0	---	---	---	---	
Alkalinity, total (as CaCO3)	----	E290	2.0	mg/L	33.7	---	---	---	---	
Solids, total dissolved [TDS], calculated	----	EC103	1.0	mg/L	52.0	---	---	---	---	
Anions and Nutrients										
Chloride	16887-00-6	E235.Cl	0.50	mg/L	4.10	---	---	---	---	
Fluoride	16984-48-8	E235.F	0.020	mg/L	0.063	---	---	---	---	
Nitrate (as N)	14797-55-8	E235.NO3	0.020	mg/L	0.079	---	---	---	---	
Nitrite (as N)	14797-65-0	E235.NO2	0.010	mg/L	<0.010	---	---	---	---	
Sulfate (as SO4)	14808-79-8	E235.SO4	0.30	mg/L	3.36	---	---	---	---	
Nitrate + Nitrite (as N)	----	EC235.N+N	0.0500	mg/L	0.0790	---	---	---	---	
Total Sulfides										
Sulfide, total (as S)	18496-25-8	E395	0.0015	mg/L	<0.0015	---	---	---	---	
Ion Balance										
Anion sum	----	EC101	0.10	meq/L	0.87	---	---	---	---	
Cation sum	----	EC101	0.10	meq/L	0.94	---	---	---	---	
Ion balance (APHA)	----	EC101	0.01	%	3.87	---	---	---	---	
Ion balance (cations/anions)	----	EC101	0.010	%	108	---	---	---	---	
Total Metals										
Aluminum, total	7429-90-5	E420	0.0030	mg/L	0.288	---	---	---	---	
Antimony, total	7440-36-0	E420	0.00010	mg/L	<0.00010	---	---	---	---	
Arsenic, total	7440-38-2	E420	0.00010	mg/L	0.00035	---	---	---	---	
Barium, total	7440-39-3	E420	0.00010	mg/L	0.0224	---	---	---	---	
Beryllium, total	7440-41-7	E420	0.000020	mg/L	<0.000020	---	---	---	---	



Analytical Results

Sub-Matrix: Water (Matrix: Water)					Client sample ID	Raw Water-Lake Intake	----	----	----	----
Client sampling date / time					20-Apr-2023	----	----	----	----	
Analyte	CAS Number	Method	LOR	Unit	FC2300954-001	-----	-----	-----	-----	
					Result	---	---	---	---	
Total Metals										
Bismuth, total	7440-69-9	E420	0.000050	mg/L	<0.000050	---	---	---	---	
Boron, total	7440-42-8	E420	0.010	mg/L	0.013	---	---	---	---	
Cadmium, total	7440-43-9	E420	0.0000050	mg/L	0.0000090	---	---	---	---	
Calcium, total	7440-70-2	E420	0.050	mg/L	9.84	---	---	---	---	
Cesium, total	7440-46-2	E420	0.000010	mg/L	0.000045	---	---	---	---	
Chromium, total	7440-47-3	E420	0.00050	mg/L	0.00051	---	---	---	---	
Cobalt, total	7440-48-4	E420	0.00010	mg/L	0.00010	---	---	---	---	
Copper, total	7440-50-8	E420	0.00050	mg/L	0.00129	---	---	---	---	
Iron, total	7439-89-6	E420	0.010	mg/L	0.358	---	---	---	---	
Lead, total	7439-92-1	E420	0.000050	mg/L	0.000189	---	---	---	---	
Lithium, total	7439-93-2	E420	0.0010	mg/L	0.0035	---	---	---	---	
Magnesium, total	7439-95-4	E420	0.0050	mg/L	3.12	---	---	---	---	
Manganese, total	7439-96-5	E420	0.00010	mg/L	0.00800	---	---	---	---	
Molybdenum, total	7439-98-7	E420	0.000050	mg/L	0.000234	---	---	---	---	
Nickel, total	7440-02-0	E420	0.00050	mg/L	0.00077	---	---	---	---	
Phosphorus, total	7723-14-0	E420	0.050	mg/L	<0.050	---	---	---	---	
Potassium, total	7440-09-7	E420	0.050	mg/L	1.03	---	---	---	---	
Rubidium, total	7440-17-7	E420	0.00020	mg/L	0.00157	---	---	---	---	
Selenium, total	7782-49-2	E420	0.000050	mg/L	<0.000050 ^{DTSE}	---	---	---	---	
Silicon, total	7440-21-3	E420	0.10	mg/L	2.77	---	---	---	---	
Silver, total	7440-22-4	E420	0.000010	mg/L	<0.000010	---	---	---	---	
Sodium, total	7440-23-5	E420	0.050	mg/L	3.80	---	---	---	---	
Strontium, total	7440-24-6	E420	0.00020	mg/L	0.0714	---	---	---	---	
Sulfur, total	7704-34-9	E420	0.50	mg/L	1.41	---	---	---	---	
Tellurium, total	13494-80-9	E420	0.00020	mg/L	<0.00020	---	---	---	---	
Thallium, total	7440-28-0	E420	0.000010	mg/L	<0.000010	---	---	---	---	
Thorium, total	7440-29-1	E420	0.00010	mg/L	<0.00010	---	---	---	---	
Tin, total	7440-31-5	E420	0.00010	mg/L	<0.00010	---	---	---	---	
Titanium, total	7440-32-6	E420	0.00030	mg/L	0.00813	---	---	---	---	
Tungsten, total	7440-33-7	E420	0.00010	mg/L	<0.00010	---	---	---	---	



Analytical Results

Sub-Matrix: Water					Client sample ID	Raw Water-Lake Intake	----	----	----	----
(Matrix: Water)					Client sampling date / time	20-Apr-2023	----	----	----	----
Analyte	CAS Number	Method	LOR	Unit	FC2300954-001	-----	-----	-----	-----	
					Result	---	---	---	---	
Total Metals										
Uranium, total	7440-61-1	E420	0.000010	mg/L	0.000141	---	---	---	---	
Vanadium, total	7440-62-2	E420	0.000050	mg/L	0.000099	---	---	---	---	
Zinc, total	7440-66-6	E420	0.0030	mg/L	0.0036	---	---	---	---	
Zirconium, total	7440-67-7	E420	0.000020	mg/L	0.000034	---	---	---	---	
Dissolved Metals										
Aluminum, dissolved	7429-90-5	E421	0.0010	mg/L	0.0055	---	---	---	---	
Antimony, dissolved	7440-36-0	E421	0.000010	mg/L	<0.000010	---	---	---	---	
Arsenic, dissolved	7440-38-2	E421	0.000010	mg/L	0.000020	---	---	---	---	
Barium, dissolved	7440-39-3	E421	0.000010	mg/L	0.0196	---	---	---	---	
Beryllium, dissolved	7440-41-7	E421	0.000020	mg/L	<0.000020	---	---	---	---	
Bismuth, dissolved	7440-69-9	E421	0.000050	mg/L	<0.000050	---	---	---	---	
Boron, dissolved	7440-42-8	E421	0.010	mg/L	0.012	---	---	---	---	
Cadmium, dissolved	7440-43-9	E421	0.0000050	mg/L	0.0000063	---	---	---	---	
Calcium, dissolved	7440-70-2	E421	0.050	mg/L	9.84	---	---	---	---	
Cesium, dissolved	7440-46-2	E421	0.000010	mg/L	<0.000010	---	---	---	---	
Chromium, dissolved	7440-47-3	E421	0.000050	mg/L	<0.000050	---	---	---	---	
Cobalt, dissolved	7440-48-4	E421	0.000010	mg/L	<0.000010	---	---	---	---	
Copper, dissolved	7440-50-8	E421	0.000020	mg/L	0.000078	---	---	---	---	
Iron, dissolved	7439-89-6	E421	0.030	mg/L	0.050	---	---	---	---	
Lead, dissolved	7439-92-1	E421	0.000050	mg/L	<0.000050	---	---	---	---	
Lithium, dissolved	7439-93-2	E421	0.0010	mg/L	0.0031	---	---	---	---	
Magnesium, dissolved	7439-95-4	E421	0.0050	mg/L	3.12	---	---	---	---	
Manganese, dissolved	7439-96-5	E421	0.00500	mg/L	<0.00500	---	---	---	---	
Molybdenum, dissolved	7439-98-7	E421	0.000050	mg/L	0.000239	---	---	---	---	
Nickel, dissolved	7440-02-0	E421	0.000050	mg/L	<0.000050	---	---	---	---	
Phosphorus, dissolved	7723-14-0	E421	0.050	mg/L	<0.050	---	---	---	---	
Potassium, dissolved	7440-09-7	E421	0.050	mg/L	0.950	---	---	---	---	
Rubidium, dissolved	7440-17-7	E421	0.000020	mg/L	0.000098	---	---	---	---	
Selenium, dissolved	7782-49-2	E421	0.000050	mg/L	0.000101 ^{DTSE}	---	---	---	---	
Silicon, dissolved	7440-21-3	E421	0.050	mg/L	2.22	---	---	---	---	



Analytical Results

Sub-Matrix: Water (Matrix: Water)					Client sample ID	Raw Water-Lake Intake	----	----	----	----
Client sampling date / time					20-Apr-2023	----	----	----	----	
Analyte	CAS Number	Method	LOR	Unit	FC2300954-001	-----	-----	-----	-----	
					Result	---	---	---	---	
Dissolved Metals										
Silver, dissolved	7440-22-4	E421	0.000010	mg/L	<0.000010	---	---	---	---	
Sodium, dissolved	7440-23-5	E421	0.050	mg/L	3.90	---	---	---	---	
Strontium, dissolved	7440-24-6	E421	0.00020	mg/L	0.0684	---	---	---	---	
Sulfur, dissolved	7704-34-9	E421	0.50	mg/L	1.48	---	---	---	---	
Tellurium, dissolved	13494-80-9	E421	0.00020	mg/L	<0.00020	---	---	---	---	
Thallium, dissolved	7440-28-0	E421	0.000010	mg/L	<0.000010	---	---	---	---	
Thorium, dissolved	7440-29-1	E421	0.00010	mg/L	<0.00010	---	---	---	---	
Tin, dissolved	7440-31-5	E421	0.00010	mg/L	<0.00010	---	---	---	---	
Titanium, dissolved	7440-32-6	E421	0.00030	mg/L	0.00039	---	---	---	---	
Tungsten, dissolved	7440-33-7	E421	0.00010	mg/L	<0.00010	---	---	---	---	
Uranium, dissolved	7440-61-1	E421	0.000010	mg/L	0.000126	---	---	---	---	
Vanadium, dissolved	7440-62-2	E421	0.00050	mg/L	<0.00050	---	---	---	---	
Zinc, dissolved	7440-66-6	E421	0.0010	mg/L	0.0017	---	---	---	---	
Zirconium, dissolved	7440-67-7	E421	0.00030	mg/L	<0.00030	---	---	---	---	
Dissolved metals filtration location	----	EP421	-	-	Laboratory	---	---	---	---	
Aggregate Organics										
Naphthenic acids	----	E565-L	0.10	mg/L	<0.10	---	---	---	---	
Volatile Organic Compounds [Fuels]										
Benzene	71-43-2	E611A	0.50	µg/L	<0.50	---	---	---	---	
Ethylbenzene	100-41-4	E611A	0.50	µg/L	<0.50	---	---	---	---	
Styrene	100-42-5	E611A	0.50	µg/L	<0.50	---	---	---	---	
Toluene	108-88-3	E611A	0.50	µg/L	<0.50	---	---	---	---	
Xylene, m+p-	179601-23-1	E611A	0.40	µg/L	<0.40	---	---	---	---	
Xylene, o-	95-47-6	E611A	0.30	µg/L	<0.30	---	---	---	---	
Xylenes, total	1330-20-7	E611A	0.50	µg/L	<0.50	---	---	---	---	
BTEX, total	----	E611A	1.0	µg/L	<1.0	---	---	---	---	
Hydrocarbons										
F1 (C6-C10)	----	E581.F1	100	µg/L	<100	---	---	---	---	
F1-BTEX	----	EC580	25	µg/L	<100	---	---	---	---	
F2 (C10-C16)	----	E601	100	µg/L	<100	---	---	---	---	



Analytical Results

Sub-Matrix: Water (Matrix: Water)					Client sample ID	Raw Water-Lake Intake	----	----	----	----
Client sampling date / time					20-Apr-2023	----	----	----	----	
Analyte	CAS Number	Method	LOR	Unit	FC2300954-001	-----	-----	-----	-----	
					Result	---	---	---	---	
Hydrocarbons										
F3 (C16-C34)	----	E601	250	µg/L	<250	---	---	---	---	
F4 (C34-C50)	----	E601	250	µg/L	<250	---	---	---	---	
Hydrocarbons, total (C6-C50)	----	EC581	370	µg/L	<380	---	---	---	---	
Hydrocarbons Surrogates										
Bromobenzotrifluoride, 2- (F2-F4 surrogate)	392-83-6	E601	1.0	%	85.9	---	---	---	---	
Dichlorotoluene, 3,4-	95-75-0	E581.F1	1.0	%	107	---	---	---	---	
Volatile Organic Compounds Surrogates										
Bromofluorobenzene, 4-	460-00-4	E611A	1.0	%	108	---	---	---	---	
Difluorobenzene, 1,4-	540-36-3	E611A	1.0	%	99.9	---	---	---	---	
Polycyclic Aromatic Hydrocarbons										
Acenaphthene	83-32-9	E641A	0.010	µg/L	<0.010	---	---	---	---	
Acenaphthylene	208-96-8	E641A	0.010	µg/L	<0.010	---	---	---	---	
Acridine	260-94-6	E641A	0.010	µg/L	<0.010	---	---	---	---	
Anthracene	120-12-7	E641A	0.010	µg/L	<0.010	---	---	---	---	
Benz(a)anthracene	56-55-3	E641A	0.010	µg/L	<0.010	---	---	---	---	
Benzo(a)pyrene	50-32-8	E641A	0.0050	µg/L	<0.0050	---	---	---	---	
Benzo(b+j)fluoranthene	n/a	E641A	0.010	µg/L	<0.010	---	---	---	---	
Benzo(b+j+k)fluoranthene	n/a	E641A	0.015	µg/L	<0.015	---	---	---	---	
Benzo(g,h,i)perylene	191-24-2	E641A	0.010	µg/L	<0.010	---	---	---	---	
Benzo(k)fluoranthene	207-08-9	E641A	0.010	µg/L	<0.010	---	---	---	---	
Chrysene	218-01-9	E641A	0.010	µg/L	<0.010	---	---	---	---	
Dibenz(a,h)anthracene	53-70-3	E641A	0.0050	µg/L	<0.0050	---	---	---	---	
Fluoranthene	206-44-0	E641A	0.010	µg/L	<0.010	---	---	---	---	
Fluorene	86-73-7	E641A	0.010	µg/L	<0.010	---	---	---	---	
Indeno(1,2,3-c,d)pyrene	193-39-5	E641A	0.010	µg/L	<0.010	---	---	---	---	
Methylnaphthalene, 1-	90-12-0	E641A	0.010	µg/L	<0.010	---	---	---	---	
Methylnaphthalene, 1+2-	----	E641A	0.015	µg/L	<0.015	---	---	---	---	
Methylnaphthalene, 2-	91-57-6	E641A	0.010	µg/L	<0.010	---	---	---	---	
Naphthalene	91-20-3	E641A	0.050	µg/L	<0.050	---	---	---	---	
Phenanthrene	85-01-8	E641A	0.020	µg/L	<0.020	---	---	---	---	



Analytical Results

Sub-Matrix: Water (Matrix: Water)					Client sample ID	Raw Water-Lake Intake	----	----	----	----
Client sampling date / time					20-Apr-2023	----	----	----	----	
Analyte	CAS Number	Method	LOR	Unit	FC2300954-001	-----	-----	-----	-----	
					Result	---	---	---	---	
Polycyclic Aromatic Hydrocarbons										
Pyrene	129-00-0	E641A	0.010	µg/L	<0.010	---	---	---	---	
Quinoline	91-22-5	E641A	0.050	µg/L	<0.050	---	---	---	---	
B(a)P total potency equivalents [B(a)P TPE]	----	E641A	0.010	µg/L	<0.010	---	---	---	---	
PAHs, high molecular weight (BC AWQ)	n/a	E641A	0.030	µg/L	<0.030	---	---	---	---	
PAHs, low molecular weight (BC AWQ)	n/a	E641A	0.060	µg/L	<0.060	---	---	---	---	
PAHs, total (CCME sewer 18)	n/a	E641A	0.070	µg/L	<0.070	---	---	---	---	
PAHs, total (EPA 16)	n/a	E641A	0.065	µg/L	<0.065	---	---	---	---	
Polycyclic Aromatic Hydrocarbons Surrogates										
Chrysene-d12	1719-03-5	E641A	0.1	%	103	---	---	---	---	
Naphthalene-d8	1146-65-2	E641A	0.1	%	117	---	---	---	---	
Phenanthrene-d10	1517-22-2	E641A	0.1	%	130	---	---	---	---	

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



CERTIFICATE OF ANALYSIS

Work Order	: FC2300954	Page	: 1 of 6
Client	: Regional Municipality of Wood Buffalo	Laboratory	: Fort McMurray - Environmental
Contact	: Water Treatment Plant	Account Manager	: Megan Trydal
Address	: 1 Silin Forest Road Fort McMurray AB Canada T9H 5A1	Address	: #4, 340 Macalpine Crescent Fort McMurray AB Canada T9H 4A8
Telephone	: 780-762-5863	Telephone	: +1 780 791 1524
Project	: Fort Chipewyan Imperial Release	Date Samples Received	: 21-Apr-2023 08:34
PO	: 4500049712	Date Analysis	: 21-Apr-2023
C-O-C number	: ----	Commenced	
Sampler	: DM	Issue Date	: 25-Apr-2023 09:50
Site	:		
Quote number	: Q61323 (Fort chip)		
No. of samples received	: 1		
No. of samples analysed	: 1		

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.

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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.

<i>Signatories</i>	<i>Position</i>	<i>Laboratory Department</i>
Alex Drake	Lab Analyst	Inorganics, Edmonton, Alberta
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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).

Measurement Uncertainty: The reported uncertainties in this report are expanded uncertainties calculated using a coverage factor of 2, which gives a level of confidence of approximately 95%.

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.

<i>Unit</i>	<i>Description</i>
-	no units
%	percent
µg/L	micrograms per litre
µS/cm	microsiemens per centimetre
meq/L	milliequivalents per litre
mg/L	milligrams per litre
pH units	pH units
psu	practical salinity units

>: greater than.

<: less than.

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

<i>Qualifier</i>	<i>Description</i>
DTSE	<i>Dissolved Se concentration exceeds total. Positive bias on D-Se suspected due to signal enhancement from volatile selenium species. Contact ALS if an alternative test to address this interference is needed.</i>



Analytical Results

FC2300954-001

Sub-Matrix: Water

(Matrix: Water)

Client sample ID: Raw Water-Lake Intake

Client sampling date / time: 20-Apr-2023

Analyte	CAS Number	Result	LOR	Unit	Method	Prep Date	Analysis Date	QCLot
Physical Tests								
Hardness (as CaCO ₃), dissolved	----	37.4	0.50	mg/L	EC100	-	21-Apr-2023	-
Salinity	----	<1.0	1.0	psu	EC100S	-	24-Apr-2023	-
Conductivity	----	91.5	2.0	µS/cm	E100	21-Apr-2023	21-Apr-2023	906561
pH	----	7.67	0.10	pH units	E108	21-Apr-2023	21-Apr-2023	906560
Alkalinity, bicarbonate (as HCO ₃)	71-52-3	41.1	1.0	mg/L	E290	21-Apr-2023	21-Apr-2023	906562
Alkalinity, carbonate (as CO ₃)	3812-32-6	<1.0	1.0	mg/L	E290	21-Apr-2023	21-Apr-2023	906562
Alkalinity, hydroxide (as OH)	14280-30-9	<1.0	1.0	mg/L	E290	21-Apr-2023	21-Apr-2023	906562
Alkalinity, total (as CaCO ₃)	----	33.7	2.0	mg/L	E290	21-Apr-2023	21-Apr-2023	906562
Solids, total dissolved [TDS], calculated	----	52.0	1.0	mg/L	EC103	-	21-Apr-2023	-
Anions and Nutrients								
Chloride	16887-00-6	4.10	0.50	mg/L	E235.Cl	21-Apr-2023	22-Apr-2023	906567
Fluoride	16984-48-8	0.063	0.020	mg/L	E235.F	21-Apr-2023	22-Apr-2023	906564
Nitrate (as N)	14797-55-8	0.079	0.020	mg/L	E235.NO3	21-Apr-2023	22-Apr-2023	906565
Nitrite (as N)	14797-65-0	<0.010	0.010	mg/L	E235.NO2	21-Apr-2023	22-Apr-2023	906568
Sulfate (as SO ₄)	14808-79-8	3.36	0.30	mg/L	E235.SO4	21-Apr-2023	22-Apr-2023	906566
Nitrate + Nitrite (as N)	----	0.0790	0.05	mg/L	EC235.N+N	-	22-Apr-2023	-
Total Sulfides								
Sulfide, total (as S)	18496-25-8	<0.0015	0.0015	mg/L	E395	-	24-Apr-2023	908706
Ion Balance								
Anion sum	----	0.87	0.10	meq/L	EC101	-	21-Apr-2023	-
Cation sum	----	0.94	0.10	meq/L	EC101	-	21-Apr-2023	-
Ion balance (APHA)	----	3.87	0.01	%	EC101	-	21-Apr-2023	-
Ion balance (cations/anions)	----	108	0.010	%	EC101	-	21-Apr-2023	-
Total Metals								
Aluminum, total	7429-90-5	0.288	0.0030	mg/L	E420	21-Apr-2023	21-Apr-2023	906079
Antimony, total	7440-36-0	<0.00010	0.00010	mg/L	E420	21-Apr-2023	21-Apr-2023	906079
Arsenic, total	7440-38-2	0.00035	0.00010	mg/L	E420	21-Apr-2023	21-Apr-2023	906079
Barium, total	7440-39-3	0.0224	0.00010	mg/L	E420	21-Apr-2023	21-Apr-2023	906079
Beryllium, total	7440-41-7	<0.000020	0.000020	mg/L	E420	21-Apr-2023	21-Apr-2023	906079
Bismuth, total	7440-69-9	<0.000050	0.000050	mg/L	E420	21-Apr-2023	21-Apr-2023	906079
Boron, total	7440-42-8	0.013	0.010	mg/L	E420	21-Apr-2023	21-Apr-2023	906079
Cadmium, total	7440-43-9	0.0000090	0.0000050	mg/L	E420	21-Apr-2023	21-Apr-2023	906079
Calcium, total	7440-70-2	9.84	0.050	mg/L	E420	21-Apr-2023	21-Apr-2023	906079
Cesium, total	7440-46-2	0.000045	0.000010	mg/L	E420	21-Apr-2023	21-Apr-2023	906079
Chromium, total	7440-47-3	0.00051	0.00050	mg/L	E420	21-Apr-2023	21-Apr-2023	906079
Cobalt, total	7440-48-4	0.00010	0.00010	mg/L	E420	21-Apr-2023	21-Apr-2023	906079
Copper, total	7440-50-8	0.00129	0.00050	mg/L	E420	21-Apr-2023	21-Apr-2023	906079
Iron, total	7439-89-6	0.358	0.010	mg/L	E420	21-Apr-2023	21-Apr-2023	906079
Lead, total	7439-92-1	0.000189	0.000050	mg/L	E420	21-Apr-2023	21-Apr-2023	906079
Lithium, total	7439-93-2	0.0035	0.0010	mg/L	E420	21-Apr-2023	21-Apr-2023	906079
Magnesium, total	7439-95-4	3.12	0.0050	mg/L	E420	21-Apr-2023	21-Apr-2023	906079
Manganese, total	7439-96-5	0.00800	0.00010	mg/L	E420	21-Apr-2023	21-Apr-2023	906079
Molybdenum, total	7439-98-7	0.000234	0.000050	mg/L	E420	21-Apr-2023	21-Apr-2023	906079
Nickel, total	7440-02-0	0.00077	0.00050	mg/L	E420	21-Apr-2023	21-Apr-2023	906079
Phosphorus, total	7723-14-0	<0.050	0.050	mg/L	E420	21-Apr-2023	21-Apr-2023	906079
Potassium, total	7440-09-7	1.03	0.050	mg/L	E420	21-Apr-2023	21-Apr-2023	906079



Analytical Results

FC2300954-001

Sub-Matrix: Water

(Matrix: Water)

Client sample ID: Raw Water-Lake Intake

Client sampling date / time: 20-Apr-2023

Analyte	CAS Number	Result	LOR	Unit	Method	Prep Date	Analysis Date	QCLOT
Total Metals								
Rubidium, total	7440-17-7	0.00157	0.00020	mg/L	E420	21-Apr-2023	21-Apr-2023	906079
Selenium, total	7782-49-2	<0.000050 ^{DTSE}	0.000050	mg/L	E420	21-Apr-2023	21-Apr-2023	906079
Silicon, total	7440-21-3	2.77	0.10	mg/L	E420	21-Apr-2023	21-Apr-2023	906079
Silver, total	7440-22-4	<0.000010	0.000010	mg/L	E420	21-Apr-2023	21-Apr-2023	906079
Sodium, total	7440-23-5	3.80	0.050	mg/L	E420	21-Apr-2023	21-Apr-2023	906079
Strontium, total	7440-24-6	0.0714	0.00020	mg/L	E420	21-Apr-2023	21-Apr-2023	906079
Sulfur, total	7704-34-9	1.41	0.50	mg/L	E420	21-Apr-2023	21-Apr-2023	906079
Tellurium, total	13494-80-9	<0.00020	0.00020	mg/L	E420	21-Apr-2023	21-Apr-2023	906079
Thallium, total	7440-28-0	<0.000010	0.000010	mg/L	E420	21-Apr-2023	21-Apr-2023	906079
Thorium, total	7440-29-1	<0.00010	0.00010	mg/L	E420	21-Apr-2023	21-Apr-2023	906079
Tin, total	7440-31-5	<0.00010	0.00010	mg/L	E420	21-Apr-2023	21-Apr-2023	906079
Titanium, total	7440-32-6	0.00813	0.00030	mg/L	E420	21-Apr-2023	21-Apr-2023	906079
Tungsten, total	7440-33-7	<0.00010	0.00010	mg/L	E420	21-Apr-2023	21-Apr-2023	906079
Uranium, total	7440-61-1	0.000141	0.000010	mg/L	E420	21-Apr-2023	21-Apr-2023	906079
Vanadium, total	7440-62-2	0.00099	0.00050	mg/L	E420	21-Apr-2023	21-Apr-2023	906079
Zinc, total	7440-66-6	0.0036	0.0030	mg/L	E420	21-Apr-2023	21-Apr-2023	906079
Zirconium, total	7440-67-7	0.00034	0.00020	mg/L	E420	21-Apr-2023	21-Apr-2023	906079
Dissolved Metals								
Aluminum, dissolved	7429-90-5	0.0055	0.0010	mg/L	E421	21-Apr-2023	21-Apr-2023	906080
Antimony, dissolved	7440-36-0	<0.00010	0.00010	mg/L	E421	21-Apr-2023	21-Apr-2023	906080
Arsenic, dissolved	7440-38-2	0.00020	0.00010	mg/L	E421	21-Apr-2023	21-Apr-2023	906080
Barium, dissolved	7440-39-3	0.0196	0.00010	mg/L	E421	21-Apr-2023	21-Apr-2023	906080
Beryllium, dissolved	7440-41-7	<0.000020	0.000020	mg/L	E421	21-Apr-2023	21-Apr-2023	906080
Bismuth, dissolved	7440-69-9	<0.000050	0.000050	mg/L	E421	21-Apr-2023	21-Apr-2023	906080
Boron, dissolved	7440-42-8	0.012	0.010	mg/L	E421	21-Apr-2023	21-Apr-2023	906080
Cadmium, dissolved	7440-43-9	0.0000063	0.0000050	mg/L	E421	21-Apr-2023	21-Apr-2023	906080
Calcium, dissolved	7440-70-2	9.84	0.050	mg/L	E421	21-Apr-2023	21-Apr-2023	906080
Cesium, dissolved	7440-46-2	<0.000010	0.000010	mg/L	E421	21-Apr-2023	21-Apr-2023	906080
Chromium, dissolved	7440-47-3	<0.00050	0.00050	mg/L	E421	21-Apr-2023	21-Apr-2023	906080
Cobalt, dissolved	7440-48-4	<0.00010	0.00010	mg/L	E421	21-Apr-2023	21-Apr-2023	906080
Copper, dissolved	7440-50-8	0.00078	0.00020	mg/L	E421	21-Apr-2023	21-Apr-2023	906080
Iron, dissolved	7439-89-6	0.050	0.030	mg/L	E421	21-Apr-2023	21-Apr-2023	906080
Lead, dissolved	7439-92-1	<0.000050	0.000050	mg/L	E421	21-Apr-2023	21-Apr-2023	906080
Lithium, dissolved	7439-93-2	0.0031	0.0010	mg/L	E421	21-Apr-2023	21-Apr-2023	906080
Magnesium, dissolved	7439-95-4	3.12	0.0050	mg/L	E421	21-Apr-2023	21-Apr-2023	906080
Manganese, dissolved	7439-96-5	<0.00500	0.00500	mg/L	E421	21-Apr-2023	21-Apr-2023	906080
Molybdenum, dissolved	7439-98-7	0.000239	0.000050	mg/L	E421	21-Apr-2023	21-Apr-2023	906080
Nickel, dissolved	7440-02-0	<0.00050	0.00050	mg/L	E421	21-Apr-2023	21-Apr-2023	906080
Phosphorus, dissolved	7723-14-0	<0.050	0.050	mg/L	E421	21-Apr-2023	21-Apr-2023	906080
Potassium, dissolved	7440-09-7	0.950	0.050	mg/L	E421	21-Apr-2023	21-Apr-2023	906080
Rubidium, dissolved	7440-17-7	0.00098	0.00020	mg/L	E421	21-Apr-2023	21-Apr-2023	906080
Selenium, dissolved	7782-49-2	0.000101 ^{DTSE}	0.000050	mg/L	E421	21-Apr-2023	21-Apr-2023	906080
Silicon, dissolved	7440-21-3	2.22	0.050	mg/L	E421	21-Apr-2023	21-Apr-2023	906080
Silver, dissolved	7440-22-4	<0.000010	0.000010	mg/L	E421	21-Apr-2023	21-Apr-2023	906080
Sodium, dissolved	7440-23-5	3.90	0.050	mg/L	E421	21-Apr-2023	21-Apr-2023	906080
Strontium, dissolved	7440-24-6	0.0684	0.00020	mg/L	E421	21-Apr-2023	21-Apr-2023	906080



Analytical Results

FC2300954-001

Sub-Matrix: Water

(Matrix: Water)

Client sample ID: Raw Water-Lake Intake

Client sampling date / time: 20-Apr-2023

Analyte	CAS Number	Result	LOR	Unit	Method	Prep Date	Analysis Date	QCLot
Dissolved Metals								
Sulfur, dissolved	7704-34-9	1.48	0.50	mg/L	E421	21-Apr-2023	21-Apr-2023	906080
Tellurium, dissolved	13494-80-9	<0.00020	0.00020	mg/L	E421	21-Apr-2023	21-Apr-2023	906080
Thallium, dissolved	7440-28-0	<0.000010	0.000010	mg/L	E421	21-Apr-2023	21-Apr-2023	906080
Thorium, dissolved	7440-29-1	<0.00010	0.00010	mg/L	E421	21-Apr-2023	21-Apr-2023	906080
Tin, dissolved	7440-31-5	<0.00010	0.00010	mg/L	E421	21-Apr-2023	21-Apr-2023	906080
Titanium, dissolved	7440-32-6	0.00039	0.00030	mg/L	E421	21-Apr-2023	21-Apr-2023	906080
Tungsten, dissolved	7440-33-7	<0.00010	0.00010	mg/L	E421	21-Apr-2023	21-Apr-2023	906080
Uranium, dissolved	7440-61-1	0.000126	0.000010	mg/L	E421	21-Apr-2023	21-Apr-2023	906080
Vanadium, dissolved	7440-62-2	<0.00050	0.00050	mg/L	E421	21-Apr-2023	21-Apr-2023	906080
Zinc, dissolved	7440-66-6	0.0017	0.0010	mg/L	E421	21-Apr-2023	21-Apr-2023	906080
Zirconium, dissolved	7440-67-7	<0.00030	0.00030	mg/L	E421	21-Apr-2023	21-Apr-2023	906080
Dissolved metals filtration location	----	Laboratory	-	-	EP421	-	21-Apr-2023	906080
Aggregate Organics								
Naphthenic acids	----	<0.10	0.10	mg/L	E565-L	21-Apr-2023	21-Apr-2023	905997
Volatile Organic Compounds [Fuels]								
Benzene	71-43-2	<0.50	0.50	µg/L	E611A	21-Apr-2023	21-Apr-2023	905959
Ethylbenzene	100-41-4	<0.50	0.50	µg/L	E611A	21-Apr-2023	21-Apr-2023	905959
Styrene	100-42-5	<0.50	0.50	µg/L	E611A	21-Apr-2023	21-Apr-2023	905959
Toluene	108-88-3	<0.50	0.50	µg/L	E611A	21-Apr-2023	21-Apr-2023	905959
Xylene, m+p-	179601-23-1	<0.40	0.40	µg/L	E611A	21-Apr-2023	21-Apr-2023	905959
Xylene, o-	95-47-6	<0.30	0.30	µg/L	E611A	21-Apr-2023	21-Apr-2023	905959
Xylenes, total	1330-20-7	<0.50	0.50	µg/L	E611A	21-Apr-2023	21-Apr-2023	905959
BTEX, total	----	<1.0	1.0	µg/L	E611A	21-Apr-2023	21-Apr-2023	905959
Hydrocarbons								
F1 (C6-C10)	----	<100	100	µg/L	E581.F1	21-Apr-2023	21-Apr-2023	905960
F1-BTEX	----	<100	100	µg/L	EC580	-	21-Apr-2023	-
F2 (C10-C16)	----	<100	100	µg/L	E601	21-Apr-2023	21-Apr-2023	906666
F3 (C16-C34)	----	<250	250	µg/L	E601	21-Apr-2023	21-Apr-2023	906666
F4 (C34-C50)	----	<250	250	µg/L	E601	21-Apr-2023	21-Apr-2023	906666
Hydrocarbons, total (C6-C50)	----	<380	380	µg/L	EC581	-	21-Apr-2023	-
Hydrocarbons Surrogates								
Bromobenzotrifluoride, 2- (F2-F4 surrogate)	392-83-6	85.9	1.0	%	E601	21-Apr-2023	21-Apr-2023	906666
Dichlorotoluene, 3,4-	95-75-0	107	1.0	%	E581.F1	21-Apr-2023	21-Apr-2023	905960
Volatile Organic Compounds Surrogates								
Bromofluorobenzene, 4-	460-00-4	108	1.0	%	E611A	21-Apr-2023	21-Apr-2023	905959
Diffluorobenzene, 1,4-	540-36-3	99.9	1.0	%	E611A	21-Apr-2023	21-Apr-2023	905959
Polycyclic Aromatic Hydrocarbons								
Acenaphthene	83-32-9	<0.010	0.010	µg/L	E641A	21-Apr-2023	21-Apr-2023	906667
Acenaphthylene	208-96-8	<0.010	0.010	µg/L	E641A	21-Apr-2023	21-Apr-2023	906667
Acridine	260-94-6	<0.010	0.010	µg/L	E641A	21-Apr-2023	21-Apr-2023	906667
Anthracene	120-12-7	<0.010	0.010	µg/L	E641A	21-Apr-2023	21-Apr-2023	906667
Benz(a)anthracene	56-55-3	<0.010	0.010	µg/L	E641A	21-Apr-2023	21-Apr-2023	906667
Benzo(a)pyrene	50-32-8	<0.0050	0.0050	µg/L	E641A	21-Apr-2023	21-Apr-2023	906667
Benzo(b+j)fluoranthene	n/a	<0.010	0.010	µg/L	E641A	21-Apr-2023	21-Apr-2023	906667
Benzo(b+j+k)fluoranthene	n/a	<0.015	0.015	µg/L	E641A	21-Apr-2023	21-Apr-2023	906667
Benzo(g,h,i)perylene	191-24-2	<0.010	0.010	µg/L	E641A	21-Apr-2023	21-Apr-2023	906667



Analytical Results

FC2300954-001

Sub-Matrix: Water

(Matrix: Water)

Client sample ID: Raw Water-Lake Intake

Client sampling date / time: 20-Apr-2023

Analyte	CAS Number	Result	LOR	Unit	Method	Prep Date	Analysis Date	QCLot
Polycyclic Aromatic Hydrocarbons								
Benzo(k)fluoranthene	207-08-9	<0.010	0.010	µg/L	E641A	21-Apr-2023	21-Apr-2023	906667
Chrysene	218-01-9	<0.010	0.010	µg/L	E641A	21-Apr-2023	21-Apr-2023	906667
Dibenz(a,h)anthracene	53-70-3	<0.0050	0.0050	µg/L	E641A	21-Apr-2023	21-Apr-2023	906667
Fluoranthene	206-44-0	<0.010	0.010	µg/L	E641A	21-Apr-2023	21-Apr-2023	906667
Fluorene	86-73-7	<0.010	0.010	µg/L	E641A	21-Apr-2023	21-Apr-2023	906667
Indeno(1,2,3-c,d)pyrene	193-39-5	<0.010	0.010	µg/L	E641A	21-Apr-2023	21-Apr-2023	906667
Methylnaphthalene, 1-	90-12-0	<0.010	0.010	µg/L	E641A	21-Apr-2023	21-Apr-2023	906667
Methylnaphthalene, 1+2-	----	<0.015	0.015	µg/L	E641A	21-Apr-2023	21-Apr-2023	906667
Methylnaphthalene, 2-	91-57-6	<0.010	0.010	µg/L	E641A	21-Apr-2023	21-Apr-2023	906667
Naphthalene	91-20-3	<0.050	0.050	µg/L	E641A	21-Apr-2023	21-Apr-2023	906667
Phenanthrene	85-01-8	<0.020	0.020	µg/L	E641A	21-Apr-2023	21-Apr-2023	906667
Pyrene	129-00-0	<0.010	0.010	µg/L	E641A	21-Apr-2023	21-Apr-2023	906667
Quinoline	91-22-5	<0.050	0.050	µg/L	E641A	21-Apr-2023	21-Apr-2023	906667
B(a)P total potency equivalents [B(a)P TPE]	----	<0.010	0.010	µg/L	E641A	21-Apr-2023	21-Apr-2023	906667
PAHs, high molecular weight (BC AWQ)	n/a	<0.030	0.03	µg/L	E641A	21-Apr-2023	21-Apr-2023	906667
PAHs, low molecular weight (BC AWQ)	n/a	<0.060	0.06	µg/L	E641A	21-Apr-2023	21-Apr-2023	906667
PAHs, total (CCME sewer 18)	n/a	<0.070	0.07	µg/L	E641A	21-Apr-2023	21-Apr-2023	906667
PAHs, total (EPA 16)	n/a	<0.065	0.065	µg/L	E641A	21-Apr-2023	21-Apr-2023	906667
Polycyclic Aromatic Hydrocarbons Surrogates								
Chrysene-d12	1719-03-5	103	0.1	%	E641A	21-Apr-2023	21-Apr-2023	906667
Naphthalene-d8	1146-65-2	117	0.1	%	E641A	21-Apr-2023	21-Apr-2023	906667
Phenanthrene-d10	1517-22-2	130	0.1	%	E641A	21-Apr-2023	21-Apr-2023	906667

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