



CERTIFICATE OF ANALYSIS

<p>Work Order : FC2301026</p> <p>Amendment : 1 (Partial Results)</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 : 2</p> <p>No. of samples analysed : 2</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 : 27-Apr-2023 17:00</p> <p>Date Analysis Commenced : 28-Apr-2023</p> <p>Issue Date : 02-May-2023 16:10</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>
Dan Nguyen	Team Leader - Inorganics	Metals, Edmonton, Alberta
Daniel Nguyen	Lab Assistant	Metals, Edmonton, Alberta
Geoff Berg	Lab Analyst	Organics, Edmonton, Alberta
Kate Dimitrova	Analyst	Inorganics, Burnaby, British Columbia
Michelle Schroder	Lab Assistant	Metals, Edmonton, Alberta
Ping Yeung	Team Leader - Inorganics	Inorganics, Edmonton, Alberta
Remy Gatabazi	Lab Analyst	Organics, Edmonton, Alberta
Shruti Mudliar	Lab Analyst	Inorganics, Edmonton, Alberta
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Work Order : FC2301026 Amendment 1
Client : Regional Municipality of Wood Buffalo
Project : Fort Chipewyan Imperial Release

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).

<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

<: 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.

(Partial Results)



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 Work Order : FC2301026 Amendment 1
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 Project : Fort Chipewyan Imperial Release

Analytical Results

Sub-Matrix: Water					Client sample ID	Raw Water - Chamber Tap	Treated Water	----	----	----
(Matrix: Water)					Client sampling date / time	27-Apr-2023 09:30	27-Apr-2023 09:00	----	----	----
Analyte	CAS Number	Method	LOR	Unit	FC2301026-001	FC2301026-002	-----	-----	-----	
					Result	Result	----	----	----	
Physical Tests										
Hardness (as CaCO3), dissolved	----	EC100	0.50	mg/L	31.0	32.7	----	----	----	
Salinity	----	EC100S	1.0	psu	<1.0	<1.0	----	----	----	
Conductivity	----	E100	2.0	µS/cm	77.6	128	----	----	----	
pH	----	E108	0.10	pH units	7.28	8.53	----	----	----	
Alkalinity, bicarbonate (as HCO3)	71-52-3	E290	1.0	mg/L	35.9	44.0	----	----	----	
Alkalinity, carbonate (as CO3)	3812-32-6	E290	1.0	mg/L	<1.0	2.4	----	----	----	
Alkalinity, hydroxide (as OH)	14280-30-9	E290	1.0	mg/L	<1.0	<1.0	----	----	----	
Alkalinity, total (as CaCO3)	----	E290	2.0	mg/L	29.4	40.1	----	----	----	
Solids, total dissolved [TDS], calculated	----	EC103	1.0	mg/L	45.4	70.1	----	----	----	
Anions and Nutrients										
Chloride	16887-00-6	E235.Cl	0.50	mg/L	3.29	11.4	----	----	----	
Fluoride	16984-48-8	E235.F	0.020	mg/L	0.079	0.051	----	----	----	
Nitrate (as N)	14797-55-8	E235.NO3	0.020	mg/L	0.038	0.040	----	----	----	
Nitrite (as N)	14797-65-0	E235.NO2	0.010	mg/L	<0.010	<0.010	----	----	----	
Sulfate (as SO4)	14808-79-8	E235.SO4	0.30	mg/L	3.79	2.88	----	----	----	
Nitrate + Nitrite (as N)	----	EC235.N+N	0.0500	mg/L	<0.0500	<0.0500	----	----	----	
Total Sulfides										
Sulfide, total (as S)	18496-25-8	E395	0.0015	mg/L	<0.0015	<0.0015	----	----	----	
Ion Balance										
Anion sum	----	EC101	0.10	meq/L	0.77	1.19	----	----	----	
Cation sum	----	EC101	0.10	meq/L	0.77	1.28	----	----	----	
Ion balance (APHA)	----	EC101	0.01	%	<0.01	3.64	----	----	----	
Ion balance (cations/anions)	----	EC101	0.010	%	100	108	----	----	----	
Total Metals										
Aluminum, total	7429-90-5	E420	0.0030	mg/L	0.173	0.0167	----	----	----	
Antimony, total	7440-36-0	E420	0.00010	mg/L	<0.00010	<0.00010	----	----	----	
Arsenic, total	7440-38-2	E420	0.00010	mg/L	0.00029	0.00018	----	----	----	
Barium, total	7440-39-3	E420	0.00010	mg/L	0.0168	0.0162	----	----	----	
Beryllium, total	7440-41-7	E420	0.000020	mg/L	<0.000020	<0.000020	----	----	----	

(Partial Results)



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Analytical Results

Sub-Matrix: Water					Client sample ID	Raw Water - Chamber Tap	Treated Water	----	----	----
(Matrix: Water)					Client sampling date / time	27-Apr-2023 09:30	27-Apr-2023 09:00	----	----	----
Analyte	CAS Number	Method	LOR	Unit	FC2301026-001	FC2301026-002	-----	-----	-----	
					Result	Result	---	---	---	
Total Metals										
Bismuth, total	7440-69-9	E420	0.000050	mg/L	<0.000050	<0.000050	---	---	---	
Boron, total	7440-42-8	E420	0.010	mg/L	0.016	0.016	---	---	---	
Cadmium, total	7440-43-9	E420	0.0000050	mg/L	<0.0000050	<0.0000050	---	---	---	
Calcium, total	7440-70-2	E420	0.050	mg/L	8.05	8.73	---	---	---	
Cesium, total	7440-46-2	E420	0.000010	mg/L	0.000020	<0.000010	---	---	---	
Chromium, total	7440-47-3	E420	0.00050	mg/L	<0.00050	<0.00050	---	---	---	
Cobalt, total	7440-48-4	E420	0.00010	mg/L	<0.00010	<0.00010	---	---	---	
Copper, total	7440-50-8	E420	0.00050	mg/L	0.00118	<0.00050	---	---	---	
Iron, total	7439-89-6	E420	0.010	mg/L	0.155	<0.010	---	---	---	
Lead, total	7439-92-1	E420	0.000050	mg/L	0.000078	<0.000050	---	---	---	
Lithium, total	7439-93-2	E420	0.0010	mg/L	0.0025	0.0029	---	---	---	
Magnesium, total	7439-95-4	E420	0.0050	mg/L	2.49	2.49	---	---	---	
Manganese, total	7439-96-5	E420	0.00010	mg/L	0.00492	0.00338	---	---	---	
Molybdenum, total	7439-98-7	E420	0.000050	mg/L	0.000234	0.000207	---	---	---	
Nickel, total	7440-02-0	E420	0.00050	mg/L	<0.00050	<0.00050	---	---	---	
Phosphorus, total	7723-14-0	E420	0.050	mg/L	<0.050	<0.050	---	---	---	
Potassium, total	7440-09-7	E420	0.050	mg/L	1.02	1.00	---	---	---	
Rubidium, total	7440-17-7	E420	0.00020	mg/L	0.00115	0.00101	---	---	---	
Selenium, total	7782-49-2	E420	0.000050	mg/L	0.000066	<0.000050	---	---	---	
Silicon, total	7440-21-3	E420	0.10	mg/L	2.45	2.00	---	---	---	
Silver, total	7440-22-4	E420	0.000010	mg/L	<0.000010	<0.000010	---	---	---	
Sodium, total	7440-23-5	E420	0.050	mg/L	2.94	14.0	---	---	---	
Strontium, total	7440-24-6	E420	0.00020	mg/L	0.0563	0.0582	---	---	---	
Sulfur, total	7704-34-9	E420	0.50	mg/L	1.16	0.96	---	---	---	
Tellurium, total	13494-80-9	E420	0.00020	mg/L	<0.00020	<0.00020	---	---	---	
Thallium, total	7440-28-0	E420	0.000010	mg/L	<0.000010	<0.000010	---	---	---	
Thorium, total	7440-29-1	E420	0.00010	mg/L	<0.00010	<0.00010	---	---	---	
Tin, total	7440-31-5	E420	0.00010	mg/L	<0.00010	<0.00010	---	---	---	
Titanium, total	7440-32-6	E420	0.00030	mg/L	0.00399	<0.00030	---	---	---	
Tungsten, total	7440-33-7	E420	0.00010	mg/L	<0.00010	<0.00010	---	---	---	

(Partial Results)



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Analytical Results

Sub-Matrix: Water					Client sample ID	Raw Water - Chamber Tap	Treated Water	----	----	----
(Matrix: Water)					Client sampling date / time	27-Apr-2023 09:30	27-Apr-2023 09:00	----	----	----
Analyte	CAS Number	Method	LOR	Unit	FC2301026-001	FC2301026-002	-----	-----	-----	
					Result	Result	----	----	----	
Total Metals										
Uranium, total	7440-61-1	E420	0.000010	mg/L	0.000103	<0.000010	----	----	----	
Vanadium, total	7440-62-2	E420	0.000050	mg/L	0.000052	<0.000050	----	----	----	
Zinc, total	7440-66-6	E420	0.0030	mg/L	<0.0030	<0.0030	----	----	----	
Zirconium, total	7440-67-7	E420	0.000020	mg/L	<0.000020	<0.000020	----	----	----	
Dissolved Metals										
Aluminum, dissolved	7429-90-5	E421	0.0010	mg/L	0.0124	0.0137	----	----	----	
Antimony, dissolved	7440-36-0	E421	0.000010	mg/L	<0.000010	<0.000010	----	----	----	
Arsenic, dissolved	7440-38-2	E421	0.000010	mg/L	0.000019	0.000014	----	----	----	
Barium, dissolved	7440-39-3	E421	0.000010	mg/L	0.0152	0.0159	----	----	----	
Beryllium, dissolved	7440-41-7	E421	0.000020	mg/L	<0.000020	<0.000020	----	----	----	
Bismuth, dissolved	7440-69-9	E421	0.000050	mg/L	<0.000050	<0.000050	----	----	----	
Boron, dissolved	7440-42-8	E421	0.010	mg/L	0.013	0.013	----	----	----	
Cadmium, dissolved	7440-43-9	E421	0.0000050	mg/L	<0.0000050	<0.0000050	----	----	----	
Calcium, dissolved	7440-70-2	E421	0.050	mg/L	8.00	8.73	----	----	----	
Cesium, dissolved	7440-46-2	E421	0.000010	mg/L	<0.000010	<0.000010	----	----	----	
Chromium, dissolved	7440-47-3	E421	0.000050	mg/L	<0.000050	<0.000050	----	----	----	
Cobalt, dissolved	7440-48-4	E421	0.000010	mg/L	<0.000010	<0.000010	----	----	----	
Copper, dissolved	7440-50-8	E421	0.000020	mg/L	0.000094	0.000034	----	----	----	
Iron, dissolved	7439-89-6	E421	0.030	mg/L	<0.030	<0.030	----	----	----	
Lead, dissolved	7439-92-1	E421	0.000050	mg/L	<0.000050	<0.000050	----	----	----	
Lithium, dissolved	7439-93-2	E421	0.0010	mg/L	0.0024	0.0026	----	----	----	
Magnesium, dissolved	7439-95-4	E421	0.0050	mg/L	2.67	2.64	----	----	----	
Manganese, dissolved	7439-96-5	E421	0.00500	mg/L	<0.00500	<0.00500	----	----	----	
Molybdenum, dissolved	7439-98-7	E421	0.000050	mg/L	0.000233	0.000203	----	----	----	
Nickel, dissolved	7440-02-0	E421	0.000050	mg/L	<0.000050	<0.000050	----	----	----	
Phosphorus, dissolved	7723-14-0	E421	0.050	mg/L	<0.050	<0.050	----	----	----	
Potassium, dissolved	7440-09-7	E421	0.050	mg/L	1.00	1.01	----	----	----	
Rubidium, dissolved	7440-17-7	E421	0.000020	mg/L	0.000096	0.000097	----	----	----	
Selenium, dissolved	7782-49-2	E421	0.000050	mg/L	0.000051	<0.000050	----	----	----	
Silicon, dissolved	7440-21-3	E421	0.050	mg/L	2.14	2.02	----	----	----	

(Partial Results)



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Analytical Results

Sub-Matrix: Water (Matrix: Water)					Client sample ID	Raw Water - Chamber Tap	Treated Water	----	----	----
Client sampling date / time					27-Apr-2023 09:30	27-Apr-2023 09:00	----	----	----	
Analyte	CAS Number	Method	LOR	Unit	FC2301026-001 Result	FC2301026-002 Result	-----	-----	-----	
Dissolved Metals										
Silver, dissolved	7440-22-4	E421	0.000010	mg/L	<0.000010	<0.000010	----	----	----	
Sodium, dissolved	7440-23-5	E421	0.050	mg/L	2.92	13.7	----	----	----	
Strontium, dissolved	7440-24-6	E421	0.00020	mg/L	0.0590	0.0592	----	----	----	
Sulfur, dissolved	7704-34-9	E421	0.50	mg/L	1.09	1.19	----	----	----	
Tellurium, dissolved	13494-80-9	E421	0.00020	mg/L	<0.00020	<0.00020	----	----	----	
Thallium, dissolved	7440-28-0	E421	0.000010	mg/L	<0.000010	<0.000010	----	----	----	
Thorium, dissolved	7440-29-1	E421	0.00010	mg/L	<0.00010	<0.00010	----	----	----	
Tin, dissolved	7440-31-5	E421	0.00010	mg/L	<0.00010	<0.00010	----	----	----	
Titanium, dissolved	7440-32-6	E421	0.00030	mg/L	0.00050	<0.00030	----	----	----	
Tungsten, dissolved	7440-33-7	E421	0.00010	mg/L	<0.00010	<0.00010	----	----	----	
Uranium, dissolved	7440-61-1	E421	0.000010	mg/L	0.000088	<0.000010	----	----	----	
Vanadium, dissolved	7440-62-2	E421	0.00050	mg/L	<0.00050	<0.00050	----	----	----	
Zinc, dissolved	7440-66-6	E421	0.0010	mg/L	<0.0010	<0.0010	----	----	----	
Zirconium, dissolved	7440-67-7	E421	0.00030	mg/L	<0.00030	<0.00030	----	----	----	
Dissolved metals filtration location	----	EP421	-	-	Laboratory	Laboratory	----	----	----	
Aggregate Organics										
Naphthenic acids	----	E565-L	0.10	mg/L	<0.10	<0.10	----	----	----	
Volatile Organic Compounds [Fuels]										
Benzene	71-43-2	E611A	0.50	µg/L	<0.50	<0.50	----	----	----	
Ethylbenzene	100-41-4	E611A	0.50	µg/L	<0.50	<0.50	----	----	----	
Styrene	100-42-5	E611A	0.50	µg/L	<0.50	<0.50	----	----	----	
Toluene	108-88-3	E611A	0.50	µg/L	<0.50	<0.50	----	----	----	
Xylene, m+p-	179601-23-1	E611A	0.40	µg/L	<0.40	<0.40	----	----	----	
Xylene, o-	95-47-6	E611A	0.30	µg/L	<0.30	<0.30	----	----	----	
Xylenes, total	1330-20-7	E611A	0.50	µg/L	<0.50	<0.50	----	----	----	
BTEX, total	----	E611A	1.0	µg/L	<1.0	<1.0	----	----	----	
Hydrocarbons										
F1 (C6-C10)	----	E581.F1	100	µg/L	<100	<100	----	----	----	
F1-BTEX	----	EC580	25	µg/L	<100	<100	----	----	----	
F2 (C10-C16)	----	E601	100	µg/L	<100	<100	----	----	----	

(Partial Results)



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Sub-Matrix: Water (Matrix: Water)					Client sample ID	Raw Water - Chamber Tap	Treated Water	----	----	----
Client sampling date / time					27-Apr-2023 09:30	27-Apr-2023 09:00	----	----	----	
Analyte	CAS Number	Method	LOR	Unit	FC2301026-001	FC2301026-002	-----	-----	-----	
					Result	Result	---	---	---	
Hydrocarbons										
F3 (C16-C34)	----	E601	250	µg/L	<250	<250	---	---	---	
F4 (C34-C50)	----	E601	250	µg/L	<250	<250	---	---	---	
Hydrocarbons, total (C6-C50)	----	EC581	370	µg/L	<380	<380	---	---	---	
Hydrocarbons Surrogates										
Bromobenzotrifluoride, 2- (F2-F4 surrogate)	392-83-6	E601	1.0	%	96.6	113	---	---	---	
Dichlorotoluene, 3,4-	95-75-0	E581.F1	1.0	%	113	106	---	---	---	
Volatile Organic Compounds Surrogates										
Bromofluorobenzene, 4-	460-00-4	E611A	1.0	%	77.0	77.2	---	---	---	
Difluorobenzene, 1,4-	540-36-3	E611A	1.0	%	85.9	95.7	---	---	---	
Polycyclic Aromatic Hydrocarbons										
Acenaphthene	83-32-9	E641A	0.010	µg/L	<0.010	<0.010	---	---	---	
Acenaphthylene	208-96-8	E641A	0.010	µg/L	<0.010	<0.010	---	---	---	
Acridine	260-94-6	E641A	0.010	µg/L	<0.010	<0.010	---	---	---	
Anthracene	120-12-7	E641A	0.010	µg/L	<0.010	<0.010	---	---	---	
Benz(a)anthracene	56-55-3	E641A	0.010	µg/L	<0.010	<0.010	---	---	---	
Benzo(a)pyrene	50-32-8	E641A	0.0050	µg/L	<0.0050	<0.0050	---	---	---	
Benzo(b+j)fluoranthene	n/a	E641A	0.010	µg/L	<0.010	<0.010	---	---	---	
Benzo(b+j+k)fluoranthene	n/a	E641A	0.015	µg/L	<0.015	<0.015	---	---	---	
Benzo(g,h,i)perylene	191-24-2	E641A	0.010	µg/L	<0.010	<0.010	---	---	---	
Benzo(k)fluoranthene	207-08-9	E641A	0.010	µg/L	<0.010	<0.010	---	---	---	
Chrysene	218-01-9	E641A	0.010	µg/L	<0.010	<0.010	---	---	---	
Dibenz(a,h)anthracene	53-70-3	E641A	0.0050	µg/L	<0.0050	<0.0050	---	---	---	
Fluoranthene	206-44-0	E641A	0.010	µg/L	<0.010	<0.010	---	---	---	
Fluorene	86-73-7	E641A	0.010	µg/L	<0.010	<0.010	---	---	---	
Indeno(1,2,3-c,d)pyrene	193-39-5	E641A	0.010	µg/L	<0.010	<0.010	---	---	---	
Methylnaphthalene, 1-	90-12-0	E641A	0.010	µg/L	<0.010	<0.010	---	---	---	
Methylnaphthalene, 1+2-	----	E641A	0.015	µg/L	<0.015	<0.015	---	---	---	
Methylnaphthalene, 2-	91-57-6	E641A	0.010	µg/L	<0.010	<0.010	---	---	---	
Naphthalene	91-20-3	E641A	0.050	µg/L	<0.050	<0.050	---	---	---	
Phenanthrene	85-01-8	E641A	0.020	µg/L	<0.020	<0.020	---	---	---	

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Client sampling date / time					27-Apr-2023 09:30	27-Apr-2023 09:00	----	----	----	
Analyte	CAS Number	Method	LOR	Unit	FC2301026-001 Result	FC2301026-002 Result	-----	-----	-----	
Polycyclic Aromatic Hydrocarbons										
Pyrene	129-00-0	E641A	0.010	µg/L	<0.010	<0.010	----	----	----	
Quinoline	91-22-5	E641A	0.050	µg/L	<0.050	<0.050	----	----	----	
B(a)P total potency equivalents [B(a)P TPE]	----	E641A	0.010	µg/L	<0.010	<0.010	----	----	----	
PAHs, high molecular weight (BC AWQ)	n/a	E641A	0.030	µg/L	<0.030	<0.030	----	----	----	
PAHs, low molecular weight (BC AWQ)	n/a	E641A	0.060	µg/L	<0.060	<0.060	----	----	----	
PAHs, total (CCME sewer 18)	n/a	E641A	0.070	µg/L	<0.070	<0.070	----	----	----	
PAHs, total (EPA 16)	n/a	E641A	0.065	µg/L	<0.065	<0.065	----	----	----	
Polycyclic Aromatic Hydrocarbons Surrogates										
Chrysene-d12	1719-03-5	E641A	0.1	%	89.1	109	----	----	----	
Naphthalene-d8	1146-65-2	E641A	0.1	%	91.5	123	----	----	----	
Phenanthrene-d10	1517-22-2	E641A	0.1	%	100	126	----	----	----	

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