

Clean Harbors Canada, Ltd.

Annual Runoff and Industrial Wastewater Report

2-7-2023



ANNUAL RUNOFF and INDUSTRIAL WASTEWATER REPORT – 2022

1. Introduction

Approval 10348-03-01 Section 4.3: Runoff and Industrial Wastewater requires Clean Harbors to monitor the runoff control system, as required in TABLE 4.3-D and TABLE 4.3-E. Section 4.3.19 requires Clean Harbors to submit the Annual Runoff and Industrial Wastewater Report in TABLE 4.3-D to the Director. The minimum contents of the Annual Runoff and Industrial Wastewater Report are described in Section 4.3.20 with an additional requirement outlined in Section 4.3.22. These monitoring and reporting requirements are summarized in Table A.

Table A **Concordance with the *Environmental Protection and Enhancement Act* Approval No 10348-03-01, Section 4.3: Runoff and Industrial Wastewater**

Approval Section Number	Requirement	Location
4.3.19	The Annual Runoff and Industrial Wastewater Report shall include, at a minimum, all the following information:	
4.3.19(a)	An annual summary assessment of the monitoring results relative to the limits in TABLE 4.3-B;	Section 2, Appendices A, B & C
4.3.19(b)	An annual summary assessment of the monitoring results relative to the limits in TABLE 4.3-C;	Section 3
4.3.19(c)(i)	An annual summary assessment of the performance of the: runoff control system,	Section 4
4.3.19(c)(ii)	An annual summary assessment of the performance of the: pollution abatement equipment, and	Section 5
4.3.19(c)(iii)	An annual summary assessment of the performance of the: monitoring equipment;	Section 6
4.3.19(d)(i)	An annual summary of management and disposal of the: industrial wastewaters as per 4.3.7, and	Section 7
4.3.19(d)(ii)	An annual summary of management and disposal of the: specified runoff as per 4.3.7;	Section 8
4.3.19(e)	An annual summary and evaluation of management and disposal of runoff in general;	Section 9
4.3.19(f)	An annual summary of the results pursuant to 4.3.22;	Section 10, Tables 1 & 2, Appendix D
4.3.19(g)	An annual summary of runoff contraventions reported pursuant to 2.1.1; and	Section 11
4.3.19(h)	Any other information as required in writing by the Director.	Section 12

2. Assessment of Surface Water Detention Pond Monitoring Results

Pond B received surface water from the landfill facility in 2022. Pond C collects water from the non-regulated maintenance and parking area adjacent to the landfill.

Ponds B and C were sampled April 11, 2022. The results were received from ALS Labs on April 19th. The results from Pond B did not meet discharge criteria so only Pond C, which met the criteria, was discharged from April 23rd to April 25th.

Pond C was sampled May 5th. The results for Pond C were received from ALS Labs on May 19th. Discharge commenced May 20th and concluded May 26th. Pond B was not sampled or discharged in May.

Pond B was sampled on July 4th. The results for Pond B were received from ALS Labs on July 11th. Discharge commenced July 13 and concluded July 26th. Pond C was not sampled or discharged in July.

A comparison of the Pond B monitoring results for each sampling/discharge event and the discharge criteria is shown in the Table below. The analytical reports can be found in Appendices A and C.

Parameter	Limit	April 19 Not discharged	July 4
pH	6.0 – 9.5	8.01	8.19
COD, mg/L	50	60	35
Total Dissolved Solids, mg/L	2500	1170	732
Total Suspended Solids, mg/L	25	30.6	3.8
Ammonia, Total Dissolved (as N) mg/L	5	0.244	0.0218
Chloride, mg/L	250	69.3	37.3
Sodium, mg/L	200	277	188
Sulphate, mg/L	500	604	348
Oil or other substances	No visible sheen	No visible sheen	No visible sheen
Rainbow Trout	50% or greater survival	Pass	Pass
Daphnia Magna		Pass	Pass

A comparison of the Pond C monitoring results for each discharge event and the discharge criteria is shown in the Table below. The analytical reports can be found in Appendices A and B.

Parameter	Limit	April 19	May 5
pH	6.0 – 9.5	7.97	8.34
COD, mg/L	50	42	43
Total Dissolved Solids, mg/L	2500	440	739
Total Suspended Solids, mg/L	25	8.2	7.8
Ammonia, Total Dissolved (as N) mg/L	5	0.0186	0.0224
Chloride, mg/L	250	52	57
Sodium, mg/L	200	91.6	170
Sulphate, mg/L	500	167	356
Oil or other substances	No visible sheen	No visible sheen	No Visible Sheen
Rainbow Trout	50% or greater survival	Pass	Pass
Daphnia Magna		Pass	Pass

3. Assessment of Tank Farm Bermed Area Monitoring Results

No liquid from the tank farm bermed area was discharged to surface in 2022.

4. Assessment of the performance of the run-off control system.

The run-off control system functioned as designed in 2022. There were no issues with the performance and operation of the run-off control system.

5. Assessment of the performance of the pollution abatement equipment

The pollution abatement equipment functioned as designed in 2022. There were no issues with the performance and operation of the pollution abatement systems.

6. Assessment of the performance of the monitoring equipment

The monitoring equipment functioned as designed in 2022. There were no issues with the performance and operation of the monitoring equipment.

7. Summary of the management and disposal of industrial wastewaters

Industrial wastewaters from the operation of the Hazardous Waste/Recyclable Storage and Processing Facility (HWRSP) were solidified and landfilled.

8. Summary of the management and disposal of specified runoff

In 2021 no runoff exceeded the limits for the parameters listed in TABLE 4.3-B or required disposal before the results of the parameters in TABLE 4.3-B were available. Water from the tank farm bermed area was solidified and landfilled.

9. Summary and evaluation of the management and disposal of runoff

Pond B and Pond C water that met the criteria of TABLE 4.3-B was discharged to surface as required by Sections 4.3.5 and 4.3.6.

The monthly discharge volumes are provided in the Table below.

	April 23 - 25	May 20 - 26	July 13 - 26
Pond B	0	0	14391 m ³
Pond C	1940 m ³	5483 m ³	

10. Summary of the results pursuant to 4.3.22

In 2022 Clean Harbors sampled Ponds B and C as per TABLE 4.3-E. Ponds B and C were sampled October 2nd (Appendix D).

The October analytical results are summarized in Tables 1 and 2 the following pages. A copy of the complete analytical reports included in Appendix D.

11. Summary of runoff contraventions reported pursuant to 2.1.1

No runoff contraventions pursuant to 2.1.1 occurred in 2022.

12. Any other information required by the Director

The Director has not required any additional information.

Table 1: Pond B – Annual Monitoring Summary

Parameter	Result	Parameter	Result
pH	8.54	Electrical conductivity	1320 uS/cm
COD	48 mg/L	DOC	18.6 mg/L
Total Dissolved Solids	933 mg/L	Total Suspended Solids	21.6 mg/L
Fluoride, dissolved	1.32 mg/L	Cyanide, (weak acid dissociable)	<0.005 mg/L
Phenols	<0.001 mg/L	Total chlorinated phenols	All analyzed chlorophenols were less than detection limit
Polychlorinated biphenyls, total	<1.0 ug/L	Total organic halogens	<20 ug/L
Petroleum Hydrocarbons Fraction F1 (C6-C10)	<0.10 mg/L	Petroleum Hydrocarbons Fraction F2 (C10-C16)	<0.10 mg/L
Benzene	<0.00050 mg/L	Toluene	<0.00050 mg/L
Ethylbenzene	<0.00050 mg/L	Xylenes (total)	<0.0005 mg/L
Ammonia nitrogen	0.0399 mg/L	Total Kjeldahl nitrogen	1.59 mg/L
Nitrate nitrogen	0.022 mg/L	Nitrite nitrogen	<0.10 mg/L
Total phosphorous	0.0614 mg/L	Dissolved phosphorous	0.0390 mg/L
Calcium	44.5 mg/L	Magnesium	23.8 mg/L
Sodium	230 mg/L	Potassium	8.38 mg/L
Carbonate	6.1 mg/L	Bicarbonate	233 mg/L
Chloride	42.4 mg/L	Sulfate	478 mg/L
Aluminum, dissolved	0.0136 mg/L	Antimony, dissolved	0.00064 mg/L
Arsenic, dissolved	0.00102 mg/L	Barium, dissolved	0.0584 mg/l
Boron, dissolved	0.102 mg/L	Cadmium, dissolved	0.0000734 mg/L
Chromium, total	0.00316 mg/L	Chromium, dissolved (+6)	<0.00050 mg/L
Cobalt, dissolved	0.00023 mg/L	Copper, dissolved	0.0107 mg/L
Lead, dissolved	0.000052 mg/L	Manganese, dissolved	0.0121 mg/L
Mercury, total	<0.0000061 mg/L	Molybdenum, dissolved	0.156 mg/L
Nickel, dissolved	0.0105 mg/L	Selenium, dissolved	0.000665 mg/L
Silver, dissolved	<0.000010 mg/L	Thallium, dissolved	0.00001 mg/L
Tin, dissolved	<0.00010 mg/L	Uranium, dissolved	0.00623 mg/L
Zinc, dissolved	0.0021 mg/L		

Table 2: Pond C – Annual Monitoring Summary

Parameter	Result	Parameter	Result
pH	8.37	Electrical conductivity	1380 uS/cm
COD	40 mg/L	DOC	17.0 mg/L
Total Dissolved Solids	905 mg/L	Total Suspended Solids	19.0 mg/L
Fluoride, dissolved	0.861 mg/L	Cyanide, (weak acid dissociable)	<0.005 mg/L
Phenols	<0.0010 mg/L	Total chlorinated phenols	All analyzed chlorophenols were less than detection limit
Polychlorinated biphenyls, total	<1.0 ug/L	Total organic halogens	20 ug/L
Petroleum Hydrocarbons Fraction F1 (C6-c10)	<0.10 mg/L	Petroleum Hydrocarbons Fraction F2 (C10-C16)	<0.10 mg/L
Benzene	<0.00050 mg/L	Toluene	<0.00050 mg/L
Ethylbenzene	0.00050 mg/L	Xylenes (total)	<0.00050 mg/L
Ammonia nitrogen	0.0225 mg/L	Total Kjeldahl nitrogen	2.32 mg/L
Nitrate nitrogen	<0.020 mg/L	Nitrite nitrogen	<0.010 mg/L
Total phosphorous	0.117 mg/L	Dissolved phosphorous	0.0250 mg/L
Calcium	49.7 mg/L	Magnesium	20.9 mg/L
Sodium	233 mg/L	Potassium	6.81 mg/L
Carbonate	2.2 mg/L	Bicarbonate	188 mg/L
Chloride	72.8 mg/L	Sulfate	502 mg/L
Aluminum, dissolved	0.0703 mg/L	Antimony, dissolved	0.00070 mg/L
Arsenic, dissolved	0.00205 mg/L	Barium, dissolved	0.0536 mg/l
Boron, dissolved	0.084 mg/L	Cadmium, dissolved	0.0000432 mg/L
Chromium, total	0.00104 mg/L	Chromium, dissolved (+6)	<0.0005 mg/L
Cobalt, dissolved	0.00013 mg/L	Copper, dissolved	0.00432 mg/L
Lead, dissolved	0.000097 mg/L	Manganese, dissolved	0.00223 mg/L
Mercury, total	0.0000053 mg/L	Molybdenum, dissolved	0.115 mg/L
Nickel, dissolved	0.0125 mg/L	Selenium, dissolved	0.000481 mg/L
Silver, dissolved	<0.00001 mg/L	Thallium, dissolved	<0.00001 mg/L
Tin, dissolved	<0.00010 mg/L	Uranium, dissolved	0.00454 mg/L
Zinc, dissolved	0.0032 mg/L		

Appendix A
Pond B and Pond C
Analytical Report
April 2022



Environmental

CERTIFICATE OF ANALYSIS

Work Order : **EO2202394**
Client : **Clean Harbors Environmental Services, Inc.**
Contact : Todd Webb
Address : 9808 12 Avenue SW
Edmonton AB Canada T6X 0J5
Telephone : 780 663 2513
Project : Pond B+C
PO : EO2202394
C-O-C number : 20-966657
Sampler : TD
Site : Table 4.3B
Quote number : Q82439 / Q82442
No. of samples received : 2
No. of samples analysed : 2

Page : 1 of 4
Laboratory : Edmonton - Environmental
Account Manager : Pamela Toledo
Address : 9450 - 17 Avenue NW
Edmonton AB Canada T6N 1M9
Telephone : +1 780 413 5227
Date Samples Received : 11-Apr-2022 14:45
Date Analysis Commenced : 11-Apr-2022
Issue Date : 19-Apr-2022 15:06

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.

<i>Signatories</i>	<i>Position</i>	<i>Laboratory Department</i>
Alex Drake	Lab Analyst	Inorganics, Edmonton, Alberta
Austin Wasylshyn	Lab Analyst	Metals, Edmonton, Alberta
Dan Nguyen	Team Leader - Inorganics	Inorganics, Edmonton, Alberta
Geoff Berg	Lab Analyst	Organics, Edmonton, Alberta
Kieran Tordoff	Account Manager	External Subcontracting, Calgary, Alberta
Kira Sampley	Lab Analyst	Inorganics, Edmonton, Alberta
Muzammil Ali	Lab Analyst	Inorganics, Edmonton, Alberta
Parker Sgarbossa	Laboratory Analyst	Inorganics, Calgary, 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).

<i>Unit</i>	<i>Description</i>
-	No Unit
mg/L	milligrams per litre
pH units	pH 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.



Analytical Results

Sub-Matrix: Water					Client sample ID	Pond B	Pond C	----	----	----
(Matrix: Water)					Client sampling date / time	11-Apr-2022 11:30	11-Apr-2022 11:00	----	----	----
Analyte	CAS Number	Method	LOR	Unit	EO2202394-001	EO2202394-002	-----	-----	-----	
					Result	Result	----	----	----	
Physical Tests										
pH	----	E108	0.10	pH units	8.01	7.97	----	----	----	
solids, total dissolved [TDS]	----	E162	10	mg/L	1170	440	----	----	----	
solids, total suspended [TSS]	----	E160	3.0	mg/L	30.6	8.2	----	----	----	
Anions and Nutrients										
ammonia, total (as N)	7664-41-7	E298	0.0050	mg/L	0.244	0.0186	----	----	----	
chloride	16887-00-6	E235.Cl	0.50	mg/L	69.3	52.0	----	----	----	
sulfate (as SO4)	14808-79-8	E235.SO4	0.30	mg/L	604	167	----	----	----	
Bioassays										
Daphnia magna LC50	----	DAP-LC50-48	-	-	See attached	See attached	----	----	----	
trout bioassay LC50	----	TRT-LC50-96	-	-	See attached	See attached	----	----	----	
Total Metals										
aluminum, total	7429-90-5	E420	0.0030	mg/L	0.952	0.248	----	----	----	
antimony, total	7440-36-0	E420	0.00010	mg/L	0.00061	0.00030	----	----	----	
arsenic, total	7440-38-2	E420	0.00010	mg/L	0.00284	0.00127	----	----	----	
barium, total	7440-39-3	E420	0.00010	mg/L	0.0727	0.0407	----	----	----	
beryllium, total	7440-41-7	E420	0.000020	mg/L	0.000033	<0.000020	----	----	----	
bismuth, total	7440-69-9	E420	0.000050	mg/L	<0.000050	<0.000050	----	----	----	
boron, total	7440-42-8	E420	0.010	mg/L	0.117	0.048	----	----	----	
cadmium, total	7440-43-9	E420	0.0000050	mg/L	0.000117	0.0000637	----	----	----	
calcium, total	7440-70-2	E420	0.050	mg/L	50.5	36.4	----	----	----	
cesium, total	7440-46-2	E420	0.000010	mg/L	0.000295	0.000187	----	----	----	
chromium, total	7440-47-3	E420	0.00050	mg/L	0.00388	0.00160	----	----	----	
cobalt, total	7440-48-4	E420	0.00010	mg/L	0.00146	0.00106	----	----	----	
copper, total	7440-50-8	E420	0.00050	mg/L	0.0166	0.00597	----	----	----	
iron, total	7439-89-6	E420	0.010	mg/L	1.19	0.632	----	----	----	
lead, total	7439-92-1	E420	0.000050	mg/L	0.00224	0.00203	----	----	----	
lithium, total	7439-93-2	E420	0.0010	mg/L	0.0634	0.0151	----	----	----	
magnesium, total	7439-95-4	E420	0.0050	mg/L	26.7	11.0	----	----	----	
manganese, total	7439-96-5	E420	0.00010	mg/L	0.254	0.442	----	----	----	



Analytical Results

Sub-Matrix: Water (Matrix: Water)					Client sample ID	Pond B	Pond C	----	----	----
Client sampling date / time					11-Apr-2022 11:30	11-Apr-2022 11:00	----	----	----	
Analyte	CAS Number	Method	LOR	Unit	EO2202394-001	EO2202394-002	-----	-----	-----	
					Result	Result	---	---	---	
Total Metals										
molybdenum, total	7439-98-7	E420	0.000050	mg/L	0.149	0.0324	----	----	----	
nickel, total	7440-02-0	E420	0.00050	mg/L	0.0230	0.00902	----	----	----	
phosphorus, total	7723-14-0	E420	0.050	mg/L	0.104	0.075	----	----	----	
potassium, total	7440-09-7	E420	0.050	mg/L	7.22	3.43	----	----	----	
rubidium, total	7440-17-7	E420	0.00020	mg/L	0.00337	0.00124	----	----	----	
selenium, total	7782-49-2	E420	0.000050	mg/L	0.000858	0.000311	----	----	----	
silicon, total	7440-21-3	E420	0.10	mg/L	3.55	0.94	----	----	----	
silver, total	7440-22-4	E420	0.000010	mg/L	0.000041	0.000013	----	----	----	
sodium, total	7440-23-5	E420	0.050	mg/L	277	91.6	----	----	----	
strontium, total	7440-24-6	E420	0.00020	mg/L	0.566	0.257	----	----	----	
sulfur, total	7704-34-9	E420	0.50	mg/L	232	61.8	----	----	----	
tellurium, total	13494-80-9	E420	0.00020	mg/L	<0.00020	<0.00020	----	----	----	
thallium, total	7440-28-0	E420	0.000010	mg/L	0.000012	<0.000010	----	----	----	
thorium, total	7440-29-1	E420	0.00010	mg/L	0.00025	<0.00010	----	----	----	
tin, total	7440-31-5	E420	0.00010	mg/L	0.00034	<0.00010	----	----	----	
titanium, total	7440-32-6	E420	0.00030	mg/L	0.0142	0.00522	----	----	----	
tungsten, total	7440-33-7	E420	0.00010	mg/L	0.00255	0.00060	----	----	----	
uranium, total	7440-61-1	E420	0.000010	mg/L	0.00918	0.00106	----	----	----	
vanadium, total	7440-62-2	E420	0.00050	mg/L	0.214	0.00987	----	----	----	
zinc, total	7440-66-6	E420	0.0030	mg/L	0.0670	0.0291	----	----	----	
zirconium, total	7440-67-7	E420	0.00020	mg/L	0.00143	0.00039	----	----	----	
Aggregate Organics										
chemical oxygen demand [COD]	----	E559-L	10	mg/L	60	42	----	----	----	
oil & grease (visible sheen)	----	E566	-	-	Absent	Absent	----	----	----	

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

QUALITY CONTROL INTERPRETIVE REPORT

Work Order	: EO2202394	Page	: 1 of 8
Client	: Clean Harbors Environmental Services, Inc.	Laboratory	: Edmonton - Environmental
Contact	: Todd Webb	Account Manager	: Pamela Toledo
Address	: 9808 12 Avenue SW Edmonton AB Canada T6X 0J5	Address	: 9450 - 17 Avenue NW Edmonton, Alberta Canada T6N 1M9
Telephone	: 780 663 2513	Telephone	: +1 780 413 5227
Project	: Pond B+C	Date Samples Received	: 11-Apr-2022 14:45
PO	: EO2202394	Issue Date	: 19-Apr-2022 15:06
C-O-C number	: 20-966657		
Sampler	: TD		
Site	: Table 4.3B		
Quote number	: Q82439 / Q82442		
No. of samples received	: 2		
No. of samples analysed	: 2		

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 Services 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)

- Analysis Holding Time Outliers exist - please see following pages for full details.

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	
Aggregate Organics : Chemical Oxygen Demand by Colourimetry (Low Level)										
Amber glass total (sulfuric acid) Pond B	E559-L	11-Apr-2022	----	----	----		12-Apr-2022	28 days	1 days	✓
Aggregate Organics : Chemical Oxygen Demand by Colourimetry (Low Level)										
Amber glass total (sulfuric acid) Pond C	E559-L	11-Apr-2022	----	----	----		12-Apr-2022	28 days	1 days	✓
Aggregate Organics : Oil & Grease by Visible Sheen										
Amber glass (hydrochloric acid) Pond B	E566	11-Apr-2022	----	----	----		14-Apr-2022	28 days	3 days	✓
Aggregate Organics : Oil & Grease by Visible Sheen										
Amber glass (hydrochloric acid) Pond C	E566	11-Apr-2022	----	----	----		14-Apr-2022	28 days	3 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid) Pond B	E298	11-Apr-2022	13-Apr-2022	----	----		13-Apr-2022	28 days	2 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid) Pond C	E298	11-Apr-2022	13-Apr-2022	----	----		13-Apr-2022	28 days	2 days	✓
Anions and Nutrients : Chloride in Water by IC										
HDPE Pond B	E235.Cl	11-Apr-2022	----	----	----		11-Apr-2022	28 days	0 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 Rec Actual		Eval	Analysis Date	Holding Times Rec Actual		Eval	
Anions and Nutrients : Chloride in Water by IC											
HDPE Pond C	E235.Cl	11-Apr-2022	----	----	----		11-Apr-2022	28 days	0 days	✓	
Anions and Nutrients : Sulfate in Water by IC											
HDPE Pond B	E235.SO4	11-Apr-2022	----	----	----		11-Apr-2022	28 days	0 days	✓	
Anions and Nutrients : Sulfate in Water by IC											
HDPE Pond C	E235.SO4	11-Apr-2022	----	----	----		11-Apr-2022	28 days	0 days	✓	
Bioassays : Survival/LC50 Daphnia Magna 48 hours											
LDPE carboy Pond B	DAP-LC50-48	11-Apr-2022	----	----	----		19-Apr-2022	5 days	8 days	* EHT	
Bioassays : Survival/LC50 Daphnia Magna 48 hours											
LDPE carboy Pond C	DAP-LC50-48	11-Apr-2022	----	----	----		19-Apr-2022	5 days	8 days	* EHT	
Bioassays : Survival/LC50 Rainbow Trout (96 hours)											
LDPE carboy Pond B	TRT-LC50-96	11-Apr-2022	----	----	----		19-Apr-2022	5 days	8 days	* EHT	
Bioassays : Survival/LC50 Rainbow Trout (96 hours)											
LDPE carboy Pond C	TRT-LC50-96	11-Apr-2022	----	----	----		19-Apr-2022	5 days	8 days	* EHT	
Physical Tests : pH by Meter											
HDPE Pond B	E108	11-Apr-2022	----	----	----		12-Apr-2022	0.25 hrs	27 hrs	* EHTR-FM	
Physical Tests : pH by Meter											
HDPE Pond C	E108	11-Apr-2022	----	----	----		12-Apr-2022	0.25 hrs	27 hrs	* EHTR-FM	



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		
Physical Tests : TDS by Gravimetry											
HDPE Pond B	E162	11-Apr-2022	----	----	----		12-Apr-2022	7 days	1 days	✓	
Physical Tests : TDS by Gravimetry											
HDPE Pond C	E162	11-Apr-2022	----	----	----		12-Apr-2022	7 days	1 days	✓	
Physical Tests : TSS by Gravimetry											
HDPE Pond B	E160	11-Apr-2022	----	----	----		12-Apr-2022	7 days	1 days	✓	
Physical Tests : TSS by Gravimetry											
HDPE Pond C	E160	11-Apr-2022	----	----	----		12-Apr-2022	7 days	1 days	✓	
Total Metals : Total Metals in Water by CRC ICPMS											
HDPE total (nitric acid) Pond B	E420	11-Apr-2022	----	----	----		12-Apr-2022	180 days	1 days	✓	
Total Metals : Total Metals in Water by CRC ICPMS											
HDPE total (nitric acid) Pond C	E420	11-Apr-2022	----	----	----		12-Apr-2022	180 days	1 days	✓	

Legend & Qualifier Definitions

EHTR-FM: Exceeded ALS recommended hold time prior to sample receipt. Field Measurement recommended
 EHT: Exceeded ALS recommended hold time prior to analysis.
 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	Method	QC Lot #	Count		Frequency (%)		Evaluation
			QC	Regular	Actual	Expected	
Analytical Methods							
Laboratory Duplicates (DUP)							
Ammonia by Fluorescence	E298	457340	1	20	5.0	5.0	✓
Chemical Oxygen Demand by Colourimetry (Low Level)	E559-L	456254	1	19	5.2	5.0	✓
Chloride in Water by IC	E235.Cl	455807	1	9	11.1	5.0	✓
pH by Meter	E108	456259	1	20	5.0	5.0	✓
Sulfate in Water by IC	E235.SO4	455811	1	6	16.6	5.0	✓
TDS by Gravimetry	E162	456017	1	15	6.6	5.0	✓
Total Metals in Water by CRC ICPMS	E420	455999	1	20	5.0	5.0	✓
TSS by Gravimetry	E160	456015	2	31	6.4	5.0	✓
Laboratory Control Samples (LCS)							
Ammonia by Fluorescence	E298	457340	1	20	5.0	5.0	✓
Chemical Oxygen Demand by Colourimetry (Low Level)	E559-L	456254	1	19	5.2	5.0	✓
Chloride in Water by IC	E235.Cl	455807	1	9	11.1	5.0	✓
pH by Meter	E108	456259	1	20	5.0	5.0	✓
Sulfate in Water by IC	E235.SO4	455811	1	6	16.6	5.0	✓
TDS by Gravimetry	E162	456017	1	15	6.6	5.0	✓
Total Metals in Water by CRC ICPMS	E420	455999	1	20	5.0	5.0	✓
TSS by Gravimetry	E160	456015	2	31	6.4	5.0	✓
Method Blanks (MB)							
Ammonia by Fluorescence	E298	457340	1	20	5.0	5.0	✓
Chemical Oxygen Demand by Colourimetry (Low Level)	E559-L	456254	1	19	5.2	5.0	✓
Chloride in Water by IC	E235.Cl	455807	1	9	11.1	5.0	✓
Sulfate in Water by IC	E235.SO4	455811	1	6	16.6	5.0	✓
TDS by Gravimetry	E162	456017	1	15	6.6	5.0	✓
Total Metals in Water by CRC ICPMS	E420	455999	1	20	5.0	5.0	✓
TSS by Gravimetry	E160	456015	2	31	6.4	5.0	✓
Matrix Spikes (MS)							
Ammonia by Fluorescence	E298	457340	1	20	5.0	5.0	✓
Chemical Oxygen Demand by Colourimetry (Low Level)	E559-L	456254	1	19	5.2	5.0	✓
Chloride in Water by IC	E235.Cl	455807	1	9	11.1	5.0	✓
Sulfate in Water by IC	E235.SO4	455811	1	6	16.6	5.0	✓
Total Metals in Water by CRC ICPMS	E420	455999	1	20	5.0	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
Survival/LC50 Daphnia Magna 48 hours	DAP-LC50-48 Nautilus Environmental (Calgary) - 10828 27 Street SE Calgary Alberta Canada T2Z 3V9	Water	EPS1/RM/14	See attached report.
pH by Meter	E108 Edmonton - Environmental	Water	APHA 4500-H (mod)	pH is determined by potentiometric measurement with a pH electrode, and is conducted at ambient laboratory temperature (normally $20 \pm 5^\circ\text{C}$). For high accuracy test results, pH should be measured in the field within the recommended 15 minute hold time.
TSS by Gravimetry	E160 Edmonton - Environmental	Water	APHA 2540 D (mod)	Total Suspended Solids (TSS) are determined by filtering a sample through a glass fibre filter, following by drying of the filter at $104 \pm 1^\circ\text{C}$, with gravimetric measurement of the filtered solids. Samples containing very high dissolved solid content (i.e. seawaters, brackish waters) may produce a positive bias by this method. Alternate analysis methods are available for these types of samples.
TDS by Gravimetry	E162 Edmonton - Environmental	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.
Chloride in Water by IC	E235.Cl Edmonton - Environmental	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Sulfate in Water by IC	E235.SO4 Edmonton - Environmental	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Ammonia by Fluorescence	E298 Calgary - Environmental	Water	J. Environ. Monit., 2005, 7, 37-42 (mod)	Ammonia in water is analyzed by flow-injection analysis with fluorescence detection after reaction with orthophthaldialdehyde (OPA).
Total Metals in Water by CRC ICPMS	E420 Edmonton - Environmental	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.
Chemical Oxygen Demand by Colourimetry (Low Level)	E559-L Edmonton - Environmental	Water	APHA 5220 D (mod)	Samples are analyzed using the closed reflux colourimetric method.



<i>Analytical Methods</i>	<i>Method / Lab</i>	<i>Matrix</i>	<i>Method Reference</i>	<i>Method Descriptions</i>
Oil & Grease by Visible Sheen	E566 Edmonton - Environmental	Water	Alberta Energy Regulator, Drilling waste Management, Directive 050, July 2016	Use a qualitative visual observation of rainbow sheen to determine the presence or absence of oil and grease on water.
Survival/LC50 Rainbow Trout (96 hours)	TRT-LC50-96 Nautilus Environmental (Calgary) - 10828 27 Street SE Calgary Alberta Canada T2Z 3V9	Water	EPS1/RM/13	See attached report.
<i>Preparation Methods</i>	<i>Method / Lab</i>	<i>Matrix</i>	<i>Method Reference</i>	<i>Method Descriptions</i>
Preparation for Ammonia	EP298 Calgary - Environmental	Water		Sample preparation for Preserved Nutrients Water Quality Analysis.



QUALITY CONTROL REPORT

Work Order : **EO2202394**

Page : 1 of 10

Client : Clean Harbors Environmental Services, Inc.
Contact : Todd Webb
Address : 9808 12 Avenue SW
Edmonton AB Canada T6X 0J5
Telephone : 780 663 2513
Project : Pond B+C
PO : EO2202394
C-O-C number : 20-966657
Sampler : TD
Site : Table 4.3B
Quote number : Q82439 / Q82442
No. of samples received : 2
No. of samples analysed : 2

Laboratory : Edmonton - Environmental
Account Manager : Pamela Toledo
Address : 9450 - 17 Avenue NW
Edmonton, Alberta Canada T6N 1M9
Telephone : +1 780 413 5227
Date Samples Received : 11-Apr-2022 14:45
Date Analysis Commenced : 11-Apr-2022
Issue Date : 19-Apr-2022 15:06

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 Percentage Difference (RPD) and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits
- Reference Material (RM) Report; Recovery and Acceptance Limits
- Method Blank (MB) Report; Recovery and Acceptance Limits
- Laboratory Control Sample (LCS) Report; Recovery and Acceptance Limits

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
Alex Drake	Lab Analyst	Inorganics, Edmonton, Alberta
Austin Wasylshyn	Lab Analyst	Metals, Edmonton, Alberta
Dan Nguyen	Team Leader - Inorganics	Inorganics, Edmonton, Alberta
Geoff Berg	Lab Analyst	Organics, Edmonton, Alberta
Kieran Tordoff	Account Manager	External Subcontracting, Calgary, Alberta
Kira Sampley	Lab Analyst	Inorganics, Edmonton, Alberta
Muzammil Ali	Lab Analyst	Inorganics, Edmonton, Alberta
Parker Sgarbossa	Laboratory Analyst	Inorganics, Calgary, Alberta

Page : 2 of 10
Work Order : EO2202394
Client : Clean Harbors Environmental Services, Inc.
Project : Pond B+C



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 Services number is a unique identifier assigned to discrete substances.

DQO = Data Quality Objective.

LOR = Limit of Reporting (detection limit).

RPD = Relative Percentage Difference

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

Workorder Comments

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



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: 456014)											
EO2202284-012	Anonymous	solids, total suspended [TSS]	----	E160	3.0	mg/L	7.8	7.8	0	Diff <2x LOR	----
Physical Tests (QC Lot: 456015)											
EO2202394-002	Pond C	solids, total suspended [TSS]	----	E160	3.0	mg/L	8.2	9.2	1.0	Diff <2x LOR	----
Physical Tests (QC Lot: 456017)											
EO2202284-016	Anonymous	solids, total dissolved [TDS]	----	E162	20	mg/L	662	652	1.52%	20%	----
Physical Tests (QC Lot: 456259)											
EO2202389-001	Anonymous	pH	----	E108	0.10	pH units	7.23	7.13	1.39%	3%	----
Anions and Nutrients (QC Lot: 455807)											
EO2202389-002	Anonymous	chloride	16887-00-6	E235.Cl	0.50	mg/L	22.5	22.5	0.00444%	20%	----
Anions and Nutrients (QC Lot: 455811)											
EO2202389-002	Anonymous	sulfate (as SO4)	14808-79-8	E235.SO4	0.30	mg/L	58.3	58.6	0.553%	20%	----
Anions and Nutrients (QC Lot: 457340)											
CG2204143-001	Anonymous	ammonia, total (as N)	7664-41-7	E298	0.0050	mg/L	<0.0050	<0.0050	0	Diff <2x LOR	----
Total Metals (QC Lot: 455999)											
EO2202362-001	Anonymous	aluminum, total	7429-90-5	E420	0.0030	mg/L	0.376	0.374	0.312%	20%	----
		antimony, total	7440-36-0	E420	0.00010	mg/L	0.00050	0.00049	0.000009	Diff <2x LOR	----
		arsenic, total	7440-38-2	E420	0.00010	mg/L	0.00079	0.00080	0.00001	Diff <2x LOR	----
		barium, total	7440-39-3	E420	0.00010	mg/L	0.0686	0.0718	4.44%	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	----
		boron, total	7440-42-8	E420	0.010	mg/L	0.020	0.020	0.0004	Diff <2x LOR	----
		cadmium, total	7440-43-9	E420	0.0000050	mg/L	0.0000389	0.0000398	0.0000009	Diff <2x LOR	----
		calcium, total	7440-70-2	E420	0.050	mg/L	22.4	22.2	1.14%	20%	----
		cesium, total	7440-46-2	E420	0.000010	mg/L	0.000035	0.000034	0.0000009	Diff <2x LOR	----
		chromium, total	7440-47-3	E420	0.000050	mg/L	0.00106	0.00110	0.00005	Diff <2x LOR	----
		cobalt, total	7440-48-4	E420	0.00010	mg/L	0.00082	0.00078	0.00004	Diff <2x LOR	----
		copper, total	7440-50-8	E420	0.00050	mg/L	0.00613	0.00610	0.625%	20%	----
		iron, total	7439-89-6	E420	0.010	mg/L	0.580	0.575	0.868%	20%	----
		lead, total	7439-92-1	E420	0.000050	mg/L	0.000642	0.000625	2.73%	20%	----
		lithium, total	7439-93-2	E420	0.0010	mg/L	0.0029	0.0030	0.00010	Diff <2x LOR	----
		magnesium, total	7439-95-4	E420	0.0050	mg/L	1.89	1.88	0.728%	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
Total Metals (QC Lot: 455999) - continued											
EO2202362-001	Anonymous	manganese, total	7439-96-5	E420	0.00010	mg/L	0.150	0.150	0.0371%	20%	----
		molybdenum, total	7439-98-7	E420	0.000050	mg/L	0.00389	0.00376	3.43%	20%	----
		nickel, total	7440-02-0	E420	0.00050	mg/L	0.0222	0.0226	1.44%	20%	----
		phosphorus, total	7723-14-0	E420	0.050	mg/L	0.058	0.068	0.010	Diff <2x LOR	----
		potassium, total	7440-09-7	E420	0.050	mg/L	2.38	2.36	0.876%	20%	----
		rubidium, total	7440-17-7	E420	0.00020	mg/L	0.00148	0.00144	0.00004	Diff <2x LOR	----
		selenium, total	7782-49-2	E420	0.000050	mg/L	0.000174	0.000183	0.000009	Diff <2x LOR	----
		silicon, total	7440-21-3	E420	0.10	mg/L	2.16	2.16	0.0638%	20%	----
		silver, total	7440-22-4	E420	0.000010	mg/L	0.000028	0.000027	0.000002	Diff <2x LOR	----
		sodium, total	7440-23-5	E420	0.050	mg/L	59.4	57.5	3.26%	20%	----
		strontium, total	7440-24-6	E420	0.00020	mg/L	0.0744	0.0720	3.15%	20%	----
		sulfur, total	7704-34-9	E420	0.50	mg/L	2.57	2.49	0.08	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	0.00011	<0.00010	0.00001	Diff <2x LOR	----
		tin, total	7440-31-5	E420	0.00010	mg/L	0.00011	0.00011	0.000002	Diff <2x LOR	----
		titanium, total	7440-32-6	E420	0.00030	mg/L	0.00906	0.00892	1.55%	20%	----
		tungsten, total	7440-33-7	E420	0.00010	mg/L	0.00292	0.00258	12.3%	20%	----
		uranium, total	7440-61-1	E420	0.000010	mg/L	0.000966	0.000963	0.301%	20%	----
		vanadium, total	7440-62-2	E420	0.00050	mg/L	0.00197	0.00198	0.00001	Diff <2x LOR	----
		zinc, total	7440-66-6	E420	0.0030	mg/L	0.0515	0.0501	2.68%	20%	----
		zirconium, total	7440-67-7	E420	0.00020	mg/L	0.00061	0.00049	0.00012	Diff <2x LOR	----
Aggregate Organics (QC Lot: 456254)											
EO2202349-006	Anonymous	chemical oxygen demand [COD]	----	E559-L	100	mg/L	938	950	12	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: 456014)						
solids, total suspended [TSS]	----	E160	3	mg/L	<3.0	----
Physical Tests (QCLot: 456015)						
solids, total suspended [TSS]	----	E160	3	mg/L	<3.0	----
Physical Tests (QCLot: 456017)						
solids, total dissolved [TDS]	----	E162	10	mg/L	<10	----
Anions and Nutrients (QCLot: 455807)						
chloride	16887-00-6	E235.Cl	0.5	mg/L	<0.50	----
Anions and Nutrients (QCLot: 455811)						
sulfate (as SO4)	14808-79-8	E235.SO4	0.3	mg/L	<0.30	----
Anions and Nutrients (QCLot: 457340)						
ammonia, total (as N)	7664-41-7	E298	0.005	mg/L	<0.0050	----
Total Metals (QCLot: 455999)						
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	----
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	----



Sub-Matrix: Water

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Total Metals (QCLot: 455999) - continued						
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	----
Aggregate Organics (QCLot: 456254)						
chemical oxygen demand [COD]	----	E559-L	10	mg/L	<10	----



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: 456014)									
solids, total suspended [TSS]	----	E160	3	mg/L	150 mg/L	101	85.0	115	----
Physical Tests (QCLot: 456015)									
solids, total suspended [TSS]	----	E160	3	mg/L	150 mg/L	94.3	85.0	115	----
Physical Tests (QCLot: 456017)									
solids, total dissolved [TDS]	----	E162	10	mg/L	1000 mg/L	98.7	85.0	115	----
Physical Tests (QCLot: 456259)									
pH	----	E108	----	pH units	6 pH units	102	97.0	103	----
Anions and Nutrients (QCLot: 455807)									
chloride	16887-00-6	E235.Cl	0.5	mg/L	100 mg/L	101	90.0	110	----
Anions and Nutrients (QCLot: 455811)									
sulfate (as SO4)	14808-79-8	E235.SO4	0.3	mg/L	100 mg/L	102	90.0	110	----
Anions and Nutrients (QCLot: 457340)									
ammonia, total (as N)	7664-41-7	E298	0.005	mg/L	0.2 mg/L	96.0	85.0	115	----
Total Metals (QCLot: 455999)									
aluminum, total	7429-90-5	E420	0.003	mg/L	2 mg/L	105	80.0	120	----
antimony, total	7440-36-0	E420	0.0001	mg/L	1 mg/L	110	80.0	120	----
arsenic, total	7440-38-2	E420	0.0001	mg/L	1 mg/L	104	80.0	120	----
barium, total	7440-39-3	E420	0.0001	mg/L	0.25 mg/L	107	80.0	120	----
beryllium, total	7440-41-7	E420	0.00002	mg/L	0.1 mg/L	98.9	80.0	120	----
bismuth, total	7440-69-9	E420	0.00005	mg/L	1 mg/L	101	80.0	120	----
boron, total	7440-42-8	E420	0.01	mg/L	1 mg/L	103	80.0	120	----
cadmium, total	7440-43-9	E420	0.000005	mg/L	0.1 mg/L	98.1	80.0	120	----
calcium, total	7440-70-2	E420	0.05	mg/L	50 mg/L	97.7	80.0	120	----
cesium, total	7440-46-2	E420	0.00001	mg/L	0.05 mg/L	102	80.0	120	----
chromium, total	7440-47-3	E420	0.0005	mg/L	0.25 mg/L	103	80.0	120	----
cobalt, total	7440-48-4	E420	0.0001	mg/L	0.25 mg/L	101	80.0	120	----
copper, total	7440-50-8	E420	0.0005	mg/L	0.25 mg/L	103	80.0	120	----
iron, total	7439-89-6	E420	0.01	mg/L	1 mg/L	100	80.0	120	----
lead, total	7439-92-1	E420	0.00005	mg/L	0.5 mg/L	101	80.0	120	----
lithium, total	7439-93-2	E420	0.001	mg/L	0.25 mg/L	98.0	80.0	120	----
magnesium, total	7439-95-4	E420	0.005	mg/L	50 mg/L	106	80.0	120	----
manganese, total	7439-96-5	E420	0.0001	mg/L	0.25 mg/L	105	80.0	120	----



Sub-Matrix: Water

Analyte	CAS Number	Method	LOR	Unit	Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		Qualifier
					Concentration	LCS	Low	High	
Total Metals (QCLot: 455999) - continued									
molybdenum, total	7439-98-7	E420	0.00005	mg/L	0.25 mg/L	98.3	80.0	120	----
nickel, total	7440-02-0	E420	0.0005	mg/L	0.5 mg/L	104	80.0	120	----
phosphorus, total	7723-14-0	E420	0.05	mg/L	10 mg/L	105	80.0	120	----
potassium, total	7440-09-7	E420	0.05	mg/L	50 mg/L	102	80.0	120	----
rubidium, total	7440-17-7	E420	0.0002	mg/L	0.1 mg/L	106	80.0	120	----
selenium, total	7782-49-2	E420	0.00005	mg/L	1 mg/L	102	80.0	120	----
silicon, total	7440-21-3	E420	0.1	mg/L	10 mg/L	104	80.0	120	----
silver, total	7440-22-4	E420	0.00001	mg/L	0.1 mg/L	95.7	80.0	120	----
sodium, total	7440-23-5	E420	0.05	mg/L	50 mg/L	99.7	80.0	120	----
strontium, total	7440-24-6	E420	0.0002	mg/L	0.25 mg/L	95.3	80.0	120	----
sulfur, total	7704-34-9	E420	0.5	mg/L	50 mg/L	104	80.0	120	----
tellurium, total	13494-80-9	E420	0.0002	mg/L	0.1 mg/L	98.8	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	97.0	80.0	120	----
tin, total	7440-31-5	E420	0.0001	mg/L	0.5 mg/L	98.9	80.0	120	----
titanium, total	7440-32-6	E420	0.0003	mg/L	0.25 mg/L	100	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	104	80.0	120	----
zinc, total	7440-66-6	E420	0.003	mg/L	0.5 mg/L	96.9	80.0	120	----
zirconium, total	7440-67-7	E420	0.0002	mg/L	0.1 mg/L	92.6	80.0	120	----
Aggregate Organics (QCLot: 456254)									
chemical oxygen demand [COD]	----	E559-L	10	mg/L	100 mg/L	98.3	85.0	115	----



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.

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
Anions and Nutrients (QCLot: 455807)										
EO2202389-002	Anonymous	chloride	16887-00-6	E235.Cl	94.6 mg/L	100 mg/L	94.6	75.0	125	----
Anions and Nutrients (QCLot: 455811)										
EO2202389-002	Anonymous	sulfate (as SO4)	14808-79-8	E235.SO4	91.8 mg/L	100 mg/L	91.8	75.0	125	----
Anions and Nutrients (QCLot: 457340)										
CG2204143-002	Anonymous	ammonia, total (as N)	7664-41-7	E298	0.0994 mg/L	0.1 mg/L	99.4	75.0	125	----
Total Metals (QCLot: 455999)										
EO2202363-001	Anonymous	aluminum, total	7429-90-5	E420	0.192 mg/L	0.2 mg/L	96.3	70.0	130	----
		antimony, total	7440-36-0	E420	0.0202 mg/L	0.02 mg/L	101	70.0	130	----
		arsenic, total	7440-38-2	E420	0.0195 mg/L	0.02 mg/L	97.6	70.0	130	----
		barium, total	7440-39-3	E420	ND mg/L	0.02 mg/L	ND	70.0	130	----
		beryllium, total	7440-41-7	E420	0.0397 mg/L	0.04 mg/L	99.2	70.0	130	----
		bismuth, total	7440-69-9	E420	0.00981 mg/L	0.01 mg/L	98.1	70.0	130	----
		boron, total	7440-42-8	E420	0.107 mg/L	0.1 mg/L	107	70.0	130	----
		cadmium, total	7440-43-9	E420	0.00390 mg/L	0.004 mg/L	97.4	70.0	130	----
		calcium, total	7440-70-2	E420	ND mg/L	4 mg/L	ND	70.0	130	----
		cesium, total	7440-46-2	E420	0.00984 mg/L	0.01 mg/L	98.4	70.0	130	----
		chromium, total	7440-47-3	E420	0.0383 mg/L	0.04 mg/L	95.7	70.0	130	----
		cobalt, total	7440-48-4	E420	0.0193 mg/L	0.02 mg/L	96.6	70.0	130	----
		copper, total	7440-50-8	E420	0.0189 mg/L	0.02 mg/L	94.6	70.0	130	----
		iron, total	7439-89-6	E420	1.88 mg/L	2 mg/L	93.8	70.0	130	----
		lead, total	7439-92-1	E420	0.0190 mg/L	0.02 mg/L	95.0	70.0	130	----
		lithium, total	7439-93-2	E420	0.0955 mg/L	0.1 mg/L	95.5	70.0	130	----
		magnesium, total	7439-95-4	E420	ND mg/L	1 mg/L	ND	70.0	130	----
		manganese, total	7439-96-5	E420	ND mg/L	0.02 mg/L	ND	70.0	130	----
		molybdenum, total	7439-98-7	E420	0.0189 mg/L	0.02 mg/L	94.4	70.0	130	----
		nickel, total	7440-02-0	E420	0.0395 mg/L	0.04 mg/L	98.7	70.0	130	----
		phosphorus, total	7723-14-0	E420	10.4 mg/L	10 mg/L	104	70.0	130	----
		potassium, total	7440-09-7	E420	3.75 mg/L	4 mg/L	93.8	70.0	130	----
		rubidium, total	7440-17-7	E420	0.0197 mg/L	0.02 mg/L	98.6	70.0	130	----
		selenium, total	7782-49-2	E420	0.0391 mg/L	0.04 mg/L	97.7	70.0	130	----
		silicon, total	7440-21-3	E420	9.39 mg/L	10 mg/L	93.9	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: 455999) - continued										
EO2202363-001	Anonymous	silver, total	7440-22-4	E420	0.00386 mg/L	0.004 mg/L	96.4	70.0	130	----
		sodium, total	7440-23-5	E420	ND mg/L	2 mg/L	ND	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	96.3	70.0	130	----
		tellurium, total	13494-80-9	E420	0.0370 mg/L	0.04 mg/L	92.5	70.0	130	----
		thallium, total	7440-28-0	E420	0.00382 mg/L	0.004 mg/L	95.5	70.0	130	----
		thorium, total	7440-29-1	E420	0.0204 mg/L	0.02 mg/L	102	70.0	130	----
		tin, total	7440-31-5	E420	0.0195 mg/L	0.02 mg/L	97.6	70.0	130	----
		titanium, total	7440-32-6	E420	0.0391 mg/L	0.04 mg/L	97.7	70.0	130	----
		tungsten, total	7440-33-7	E420	0.0192 mg/L	0.02 mg/L	96.1	70.0	130	----
		uranium, total	7440-61-1	E420	0.00407 mg/L	0.004 mg/L	102	70.0	130	----
		vanadium, total	7440-62-2	E420	0.0972 mg/L	0.1 mg/L	97.2	70.0	130	----
		zinc, total	7440-66-6	E420	0.356 mg/L	0.4 mg/L	88.9	70.0	130	----
		zirconium, total	7440-67-7	E420	0.0392 mg/L	0.04 mg/L	98.0	70.0	130	----
Aggregate Organics (QCLot: 456254)										
EO2202349-007	Anonymous	chemical oxygen demand [COD]	----	E559-L	ND mg/L	100 mg/L	ND	75.0	125	----



Acute Toxicity Test Results

Samples collected April 11, 2022

Final Report

April 19, 2022

Submitted to: **ALS Environmental**
Edmonton, AB

SAMPLE INFORMATION

Sample ID/ Internal ID	Dates			Receipt temperature
	Collected	Received	Rainbow trout test initiation	
EO2202394-001 Pond B/ 2122-1886-01	11-Apr-22 at 1130h	12-Apr-22 at 1600h	13-Apr-22 at 1535h	13-Apr-22 at 1455h 14.8°C
EO2202394-002 Pond C/ 2122-1886-02	11-Apr-22 at 1100h	12-Apr-22 at 1600h	13-Apr-22 at 1540h	13-Apr-22 at 1500h 15.1°C

TEST TYPES

- Rainbow trout 96-h LC50 test
- *Daphnia magna* 48-h LC50, EC50 test

RESULTS

Toxicity test results

Sample ID	LC50/EC50 (% v/v)		
	Rainbow trout	<i>Daphnia magna</i>	
	LC50	LC50	EC50
EO2202394-001 Pond B	> 100	> 100	> 100
EO2202394-002 Pond C	> 100	> 100	> 100

LC = Lethal Concentration, EC= Effect Concentration

QA/QC

QA/QC summary	Rainbow trout	<i>Daphnia magna</i>
Reference toxicant LC50 (95% CL)	3.9 (3.5-4.4) g/L KCl ¹	6.2 (5.9-6.5) g/L NaCl ²
Reference toxicant historical mean (2 SD Range)	3.3 (2.5-4.5) g/L KCl	6.5 (5.5-7.7) g/L NaCl
Reference toxicant CV	9.7%	5.7%
Organism health history	Acceptable	Acceptable
Protocol deviations	None	None
Water quality range deviations	None	None
Control performance	Acceptable	Acceptable
Test performance	Valid	Valid

¹ Test date, April 11, 2022; ² Test Date April 11, 2022

LC = Lethal Concentration; CL = Confidence Limit, SD = Standard Deviation; CV = Coefficient of Variation



Report By:
Courtney Hewitt, BSc
Biologist



Reviewed By:
Tamara Pomeroy, BSc
Laboratory and Quality Manager

This report has been prepared by Nautilus Environmental Company Inc. based on data and/or samples provided by our client and the results of this study are for their sole benefit. Any reliance on the data by a third party is at the sole and exclusive risk of that party. The results presented here relate only to the samples tested.

APPENDIX A – Summary of test conditions

Table 1. Summary of test conditions: 96-h rainbow trout (*Oncorhynchus mykiss*) survival test.

Test species	<i>Oncorhynchus mykiss</i>
Organism source	Fish hatchery
Organism age	Juvenile
Test type	Static
Test duration	96 hours
Test vessel	5 gallon glass aquariums
Test volume	10 - 20 L, depending on size of fish
Test solution depth	Minimum 15 cm
Test concentrations	Five concentrations, plus laboratory control
Test replicates	1 per treatment
Number of organisms	10 per replicate
Control/dilution water	De-chlorinated City of Calgary tap water
Test solution renewal	None
Test temperature	15 ± 1°C
Feeding	None
Light intensity	100 to 500 lux
Photoperiod	16 hours light/8 hours dark
Aeration	6.5 ± 1 mL/min/L
Test Measurements	pH, conductivity, dissolved oxygen and temperature were measured at test initiation and test completion; salinity measured at test initiation; evaluated for survival daily
Test protocol	Environment Canada (2000), EPS 1/RM/13, with 2007 & 2016 amendments
Statistical software	None
Test endpoints	96-hour LC50
Test acceptability criteria for controls	Survival ≥ 90%
Reference toxicant	Potassium chloride (KCl)

Table 2. Summary of test conditions: 48-h *Daphnia magna* survival test.

Test species	<i>Daphnia magna</i>
Organism source	In-house culture
Organism age	<24 hours
Test type	Static
Test duration	48 hours
Test vessel	385 mL plastic vessels
Test volume	150 mL
Test concentrations	Five concentrations, plus laboratory control
Test replicates	1 per treatment
Number of organisms	10 per replicate
Control/dilution water	De-chlorinated City of Calgary tap water amended with 4 mg/L KCl and with B12 (2 µg/L) and Na ₂ SeO ₄ (2 µg Se/L)
Test solution renewal	None
Test temperature	20 ± 2°C
Feeding	None
Light intensity	400 to 800 lux
Photoperiod	16 hours light/8 hours dark
Aeration	None
Test measurements	pH, conductivity, dissolved oxygen and temperature measured at test initiation and completion; salinity and hardness measured at test initiation in undiluted sample; evaluated daily for survival
Test protocol	Environment Canada (2000), EPS 1/RM/14
Statistical software	None
Test endpoints	48-h LC50
Test acceptability criteria for controls	Survival ≥ 90%
Reference toxicant	Sodium chloride (NaCl)

APPENDIX B – Toxicity test data

Trout Bench Sheet

Method TRD Client ALS106 Reference 2122-1886-01 Chamber 2

Test Log

Day	Date	Time	Initial	Chem. Cart	Daily Data Review
0	2022-04-13	1535 *	MAF/CC	7	YTM
1	2022-04-14	0830	JCC	-	MAF
2	2022-04-15	0905	NA	-	MAF
3	2022-04-16	0900	NA	-	LW
4	2022-04-17	1010	K/CC/DJ	1	YTM

Sample Information

Initial pH: 8.0
 Initial EC (µS/cm): 1699
 Salinity (ppt): 2

Note: *; time when the test was loaded with fish

Sample Pre-Aeration

Aeration rate adjusted to 6.5 +/- 1 mL/min/L yes/no

Preaeration time

DO(mg/L) of 100%

Temp (°C) of 100%

0 hours	0.5 hours	1 hour	1.5 hours	2 hours
<u>9.8</u>	<u>9.7</u>	<u>8.9</u>		
<u>14</u>				

DO in mg/L (70% - 100% saturation)**

6.2 mg/L - 8.9 mg/L at 14°C

6.1 mg/L - 8.8 mg/L at 15°C

6.0 mg/L - 8.6 mg/L at 16°C

**corrected for altitude

Test Chemistry and Biology

Conc.	CTL	6	12	25	50	100
-------	-----	---	----	----	----	-----

pH (units) (range: 5.5-8.5)

Day 0	<u>7.5</u>	<u>7.6</u>	<u>7.6</u>	<u>7.6</u>	<u>7.7</u>	<u>7.9</u>
Day 4	<u>8.0</u>	<u>8.1</u>	<u>8.1</u>	<u>8.1</u>	<u>8.2</u>	<u>8.2</u>

EC (µS/cm)

Day 0	<u>481</u>	<u>555</u>	<u>659</u>	<u>746</u>	<u>964</u>	<u>1123</u>
Day 4	<u>500</u>	<u>573</u>	<u>683</u>	<u>775</u>	<u>996</u>	<u>1689</u>

DO (mg/L) (70-100% saturation at test temp.)

Day 0	<u>8.9</u>	<u>8.9</u>	<u>8.9</u>	<u>8.9</u>	<u>8.9</u>	<u>8.9</u>
Day 4	<u>8.6</u>	<u>8.6</u>	<u>8.6</u>	<u>8.6</u>	<u>8.6</u>	<u>8.6</u>

Temperature (°C) (range: 14-16°C)

Day 0	<u>14</u>	<u>14</u>	<u>14</u>	<u>14</u>	<u>14</u>	<u>14</u>
Day 4	<u>16</u>	<u>16</u>	<u>16</u>	<u>16</u>	<u>16</u>	<u>16</u>

Number Alive (In brackets number stressed)

Day 0	10	10	10	10	10	10
Day 1	<u>10</u>	<u>10</u>	<u>10</u>	<u>10</u>	<u>10</u>	<u>10</u>
Day 2	<u>10</u>	<u>10</u>	<u>10</u>	<u>10</u>	<u>10</u>	<u>10</u>
Day 3	<u>10</u>	<u>10</u>	<u>10</u>	<u>10</u>	<u>10</u>	<u>10</u>
Day 4	<u>10</u>	<u>10</u>	<u>10</u>	<u>10</u>	<u>10</u>	<u>10</u>

Validity Criteria: must be ≤ 10% mortality and/or stressed behavior in the control

Unless otherwise noted, behavior is considered to be normal

Control Organism Data

Control Fish	Length (cm)	Weight (g)
1	<u>3.3</u>	<u>0.4</u>
2	<u>2.8</u>	<u>0.5</u>
3	<u>2.8</u>	<u>0.5</u>
4	<u>3.0</u>	<u>0.3</u>
5	<u>3.0</u>	<u>0.3</u>
6	<u>2.8</u>	<u>0.3</u>
7	<u>2.7</u>	<u>0.3</u>
8	<u>3.1</u>	<u>0.3</u>
9	<u>3.2</u>	<u>0.3</u>
10	<u>3.7</u>	<u>0.3</u>

Loading Density (g/L):
(must be ≤0.5 g/L)

0.2

Mean Length (cm):

3.0

Length Range (cm):

2.7-3.3

Mean Weight (g):
(Must be ≥0.3g)

0.3

Weight Range (g):

0.3-0.4

Test Organism Information

Batch 2022024TR

Source Troutlodge

Tank # 9

Days Held at 15± 2°C 21
(must be ≥14 days)

Percent stock mortality 0
(7 days prior to test, must be ≤2%)

Test Volume (L) 18

Comments :

Reviewed By: SS

Date Reviewed: 202210118

Method TRD Client ALS106 Reference 2122-1886-02 Chamber 2

Test Log

Day	Date	Time	Initial	Chem. Cart	Daily Data Review
0	2022-04-13	1540 *	MAF/CC	7	km
1	2022-04-14	0830	TCC	-	MAF
2	2022-04-15	0910	NA	-	MAF
3	2022-04-16	0900	NA	-	km
4	2022-04-17	0810	Jill/CC/MAF	1	km

Sample Information

Initial pH: 8.0
 Initial EC (µS/cm): 706
 Salinity (ppt): 2

Note: * ; time when the test was loaded with fish

Sample Pre-Aeration

Aeration rate adjusted to 6.5 +/- 1 mL/min/L yes/no
 Preaeration time
 DO(mg/L) of 100%
 Temp (°C) of 100%

0 hours	0.5 hours	1 hour	1.5 hours	2 hours
<u>9.9</u>	<u>9.6</u>	<u>8.8</u>		
<u>15</u>				

DO in mg/L (70% - 100% saturation)**

6.2 mg/L - 8.9 mg/L at 14°C
 6.1 mg/L - 8.8 mg/L at 15°C
 6.0 mg/L - 8.6 mg/L at 16°C

**corrected for altitude

Test Chemistry and Biology

Conc.	CTL	6	12	25	50	100
-------	-----	---	----	----	----	-----

pH (units) (range: 5.5-8.5)

Day 0	<u>7.4</u>	<u>7.5</u>	<u>7.5</u>	<u>7.5</u>	<u>7.6</u>	<u>7.9</u>
Day 4	<u>8.1</u>	<u>8.1</u>	<u>8.1</u>	<u>8.1</u>	<u>8.1</u>	<u>7.9</u>

EC (µS/cm)

Day 0	<u>482</u>	<u>493</u>	<u>503</u>	<u>530</u>	<u>582</u>	<u>687</u>
Day 4	<u>492</u>	<u>507</u>	<u>520</u>	<u>549</u>	<u>605</u>	<u>715</u>

DO (mg/L) (70-100% saturation at test temp.)

Day 0	<u>8.9</u>	<u>8.9</u>	<u>8.9</u>	<u>8.9</u>	<u>9.9</u>	<u>8.8</u>
Day 4	<u>8.6</u>	<u>8.6</u>	<u>8.8</u>	<u>8.8</u>	<u>8.8</u>	<u>8.6</u>

Temperature (°C) (range: 14-16°C)

Day 0	<u>14</u>	<u>14</u>	<u>14</u>	<u>14</u>	<u>14</u>	<u>15</u>
Day 4	<u>16</u>	<u>16</u>	<u>15</u>	<u>15</u>	<u>15</u>	<u>16</u>

Number Alive (In brackets number stressed)

Day 0	10	10	10	10	10	10
Day 1	<u>10</u>	<u>10</u>	<u>10</u>	<u>10</u>	<u>10</u>	<u>10</u>
Day 2	<u>10</u>	<u>10</u>	<u>10</u>	<u>10</u>	<u>10</u>	<u>10</u>
Day 3	<u>10</u>	<u>10</u>	<u>10</u>	<u>10</u>	<u>10</u>	<u>10</u>
Day 4	<u>10</u>	<u>10</u>	<u>10</u>	<u>10</u>	<u>10</u>	<u>10</u>

Validity Criteria: must be ≤ 10% mortality and/or stressed behavior in the control
 Unless otherwise noted, behavior is considered to be normal

Control Organism Data			Test Organism Information	
Control Fish	Length (cm)	Weight (g)		
1	<u>2.3</u>	<u>0.4</u>	Loading Density (g/L): (must be ≤0.5 g/L)	<u>0.2</u>
2	<u>2.3</u>	<u>0.3</u>		Source: <u>Troutlodge</u>
3	<u>2.7</u>	<u>0.2</u>	Mean Length (cm):	<u>2.9</u>
4	<u>2.2</u>	<u>0.2</u>		Tank #: <u>9</u>
5	<u>2.6</u>	<u>0.2</u>	Length Range (cm):	<u>2.6-3.3</u>
6	<u>2.1</u>	<u>0.2</u>		Days Held at 15± 2°C (must be ≥14 days): <u>21</u>
7	<u>2.4</u>	<u>0.2</u>	Mean Weight (g): (Must be ≥0.3g)	<u>0.3</u>
8	<u>2.0</u>	<u>0.2</u>		Percent stock mortality (7 days prior to test, must be ≤2%): <u>0</u>
9	<u>2.0</u>	<u>0.2</u>	Weight Range (g):	<u>0.2-0.4</u>
10	<u>2.1</u>	<u>0.2</u>		Test Volume (L): <u>18</u>

Comments :

Reviewed By: SS

Date Reviewed: 2022104118

Daphnia Bench Sheet

Method DAD

Client ALS106

Reference 7127-1886-01

Test Log

Sample Information

Day	Date	Time	Technician	Chem. Cart	Daily Data Review	Initial pH:
0	2022/04/13	1455	EP/CH	2	MAF	8.0
1	2022/04/14	1000	EP	-	MAF	Initial EC (µS/cm): 1699
2	2022/04/15	0840	MAF	2	MAF	Salinity (ppt): 2

Lab Code	CTL	6	12	25	50	100

day

	pH (units) (range: 6.0-8.5)					
0	8.1	8.1	8.1	8.1	8.1	8.1
2	8.3	8.2	8.2	8.2	8.2	8.1

The pH of the sample was not adjusted prior to test setting, unless noted in the comments below

	EC (uS/cm) 1571					
0	480	540	608	756	1043	8100 EP
2	510	551	611	766	1028	1540

	DO (mg/L) (40-100% saturation at test temp.)					
0	7.9	7.9	7.9	7.9	7.9	8.1
2	7.7	7.7	7.7	7.7	7.7	7.7

	Temperature (°C) (range: 18-22 °C)					
0	20	20	20	20	20	19
2	21	21	21	21	21	21

	Number Alive (I, immobile)					
0	10	10	10	10	10	10
1	10	10	10	10	10	10
2	10	10	10	10	10	10

Validity Criteria: must be ≤ 10% mortality and/or abnormal behavior in the control

Notes: Immobile; daphnid can't swim after 60 sec. even if antenna still move

Unless otherwise noted, behaviour is considered to be normal

Culture	Young jar <u>C5</u>	Jar(s) mortality 7 days prior to test (must be ≤25%) <u>0%</u>
QA (previous month)	Days to first brood (≤12 days) <u>7</u>	Control Validity Criteria
Average number of young produced (≥15 young)	<u>31</u>	Mean % mortality at 48 hours - (must be ≤10%) <u>0</u>
Were test treatments randomized on test tray?	<input checked="" type="radio"/> Yes / <input type="radio"/> No	
Sample	DO (mg/L) of sample prior to aeration: <u>10.9</u>	Temperature (°C) of sample prior to aeration: <u>18</u>
DO % of sample prior to aeration: <u>117</u>	Is aeration required (<40% or >100%)?	<input checked="" type="radio"/> Yes or <input type="radio"/> No
Duration of aeration (37.5 +/- 12.5 mL/min/L): <u>20min</u>	Filtered with 110µm screen prior to testing	<input checked="" type="radio"/> Yes or <input type="radio"/> No
Hardness (mg CaCO ₃ /L) of 100%: <u>166</u>	Is hardness adjustment required (<25 mg CaCO ₃ /L)?	<input checked="" type="radio"/> Yes or <input type="radio"/> No
Hardness of sample after adjustment (must be between 25 - 30 mg CaCO ₃ /L)	<u>—</u>	
Alkalinity of 100% sample (mg CaCO ₃ /L): <u>—</u>		
Dilution Water	Pail label / preparation date <u>1:24/11</u>	DO Levels (40-100% saturation) - corrected for altitude -
Hardness of dilution water (mg/L) <u>209</u>		3.3 to 8.2 mg/L at 18°C 3.1 to 7.7 mg/L at 21°C
		3.2 to 8.1 mg/L at 19°C 3.0 to 7.6 mg/L at 22°C
		3.2 to 7.9 mg/L at 20°C
Comments/Observations:		

Reviewed By: SS

Date Reviewed: 2022.04.18

Method DAD

Client ALS106

Reference 2122-18EG-02

Test Log

Day	Date	Time	Technician	Chem. Cart	Daily Data Review	Sample Information
0	2022/04/13	1500	EP/CH	2	MF	Initial pH: <u>8.0</u>
1	2022/04/14	1000	SC	-	MAP	Initial EC (µS/cm): <u>706</u>
2	2022/04/15	0835	MAP	2	JC	Salinity (ppt): <u>2</u>

Lab Code	CTL	6	12	25	50	100

day	pH (units) (range: 6.0-8.5)					
0	<u>8.1</u>	<u>8.1</u>	<u>8.1</u>	<u>8.0</u>	<u>8.0</u>	<u>7.9</u>
2	<u>8.2</u>	<u>8.2</u>	<u>8.2</u>	<u>8.1</u>	<u>8.1</u>	<u>8.0</u>

The pH of the sample was not adjusted prior to test setting, unless noted in the comments below

day	EC (uS/cm)					
0	<u>467</u>	<u>486</u>	<u>501</u>	<u>523</u>	<u>575</u>	<u>668</u>
2	<u>484</u>	<u>494</u>	<u>501</u>	<u>524</u>	<u>575</u>	<u>667</u>

day	DO (mg/L) (40-100% saturation at test temp.)					
0	<u>7.9</u>	<u>7.9</u>	<u>7.9</u>	<u>7.9</u>	<u>7.9</u>	<u>8.2</u>
2	<u>7.7</u>	<u>7.7</u>	<u>7.7</u>	<u>7.7</u>	<u>7.7</u>	<u>7.7</u>

day	Temperature (°C) (range: 18-22 °C)					
0	<u>20</u>	<u>20</u>	<u>20</u>	<u>20</u>	<u>20</u>	<u>18</u>
2	<u>21</u>	<u>21</u>	<u>21</u>	<u>21</u>	<u>21</u>	<u>21</u>

day	Number Alive (I, immobile)					
0	10	10	10	10	10	10
1	<u>10</u>	<u>10</u>	<u>10</u>	<u>10</u>	<u>10</u>	<u>10 (IE)</u>
2	<u>10</u>	<u>10</u>	<u>10</u>	<u>10</u>	<u>10</u>	<u>10</u>

Validity Criteria: must be ≤ 10% mortality and/or abnormal behavior in the control

Notes: Immobile; daphnid can't swim after 60 sec. even if antenna still move

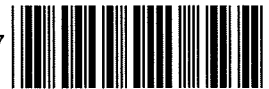
Unless otherwise noted, behaviour is considered to be normal

Culture Young jar <u>CS</u>	Jar(s) mortality 7 days prior to test (must be ≤25%) <u>0%</u>
QA (previous month) Days to first brood (≤12 days) <u>7</u> Average number of young produced (≥15 young) <u>31</u> Were test treatments randomized on test tray? <input checked="" type="radio"/> Yes / <input type="radio"/> No	Control Validity Criteria Mean % mortality at 48 hours - (must be ≤10%) <u>0</u>
Sample DO (mg/L) of sample prior to aeration: <u>11.0</u> DO % of sample prior to aeration: <u>117</u> Duration of aeration (37.5 +/- 12.5 mL/min/L): <u>20 min</u> Hardness (mg CaCO ₃ /L) of 100%: <u>87</u> Hardness of sample after adjustment (must be between 25 - 30 mg CaCO ₃ /L) <u>—</u> Alkalinity of 100% sample (mg CaCO ₃ /L): <u>—</u>	Temperature (°C) of sample prior to aeration: <u>18</u> Is aeration required (<40% or >100%)? <input checked="" type="radio"/> Yes or <input type="radio"/> No Filtered with 110µm screen prior to testing <input checked="" type="radio"/> Yes or <input type="radio"/> No Is hardness adjustment required (<25 mg CaCO ₃ /L)? <input checked="" type="radio"/> Yes or <input type="radio"/> No
Dilution Water Pail label / preparation date <u>1:04/11</u> Hardness of dilution water (mg/L) <u>209</u>	DO Levels (40-100% saturation) - corrected for altitude - 3.3 to 8.2 mg/L at 18°C 3.2 to 8.1 mg/L at 19°C 3.2 to 7.9 mg/L at 20°C 3.1 to 7.7 mg/L at 21°C 3.0 to 7.6 mg/L at 22°C
Comments/Observations:	

Reviewed By: SS

Date Reviewed: 2022/04/18

APPENDIX C – Chain-of-custody form



Destination Lab: **Nautilus Environmental (Calgary)**
Address: 10828 27 Street SE Calgary AB Canada T2Z 3V9
Work Order Number: **EO2202394**
Original Receipt Date/Time: 11/04/2022 14:45
Instructions Received

Relinquished By
Date/Time
Received By
Date/Time
Receipt Temp

Return as Indicated: Results: ALSEDClientServices@alsglobal.com Invoice: ALSEDClientServices@alsglobal.com Electronic Data: ALSEDClientServices@alsglobal.com
Attention: Pamela Toledo

ALS Sample ID	Client ID	Matrix	Container Type	Test Codes	Method Description	Due Date	Sampling Date and Time	Remarks
EO2202394-001	Pond B	Water	LDPE carboy			15-04-2022	11/04/2022 11:30	
EO2202394-001	Pond B	Water	LDPE carboy			15-04-2022	11/04/2022 11:30	
EO2202394-001	Pond B	Water	LDPE carboy			15-04-2022	11/04/2022 11:30	
EO2202394-001	Pond B	Water	LDPE carboy			15-04-2022	11/04/2022 11:30	
EO2202394-002	Pond C	Water	LDPE carboy			15-04-2022	11/04/2022 11:00	
EO2202394-002	Pond C	Water	LDPE carboy			15-04-2022	11/04/2022 11:00	
EO2202394-002	Pond C	Water	LDPE carboy			15-04-2022	11/04/2022 11:00	
EO2202394-002	Pond C	Water	LDPE carboy			15-04-2022	11/04/2022 11:00	
EO2202394-001	Pond B -01	Water	LDPE carboy	DAP-LC50-48	Survival/LC50 Daphnia Magna 48 hours	15-04-2022	11/04/2022 11:30	14.8°C
EO2202394-002	Pond C -02	Water	LDPE carboy	DAP-LC50-48	Survival/LC50 Daphnia Magna 48 hours	15-04-2022	11/04/2022 11:00	15.1°C
EO2202394-001	Pond B	Water	LDPE carboy	TRT-LC50-96	Survival/LC50 Rainbow Trout (96 hours)	15-04-2022	11/04/2022 11:30	
EO2202394-002	Pond C	Water	LDPE carboy	TRT-LC50-96	Survival/LC50 Rainbow Trout (96 hours)	15-04-2022	11/04/2022 11:00	

2122-1886
2022/04/12
16:00 oc
Jazoo
8x10L pails, 4x1L bottles
NoS/NoB
Good Condition

END OF REPORT



www.alsglobal.com

Chain of Custody (COC) / Analytical Request Form

Canada Toll Free: 1 800 668 9878

COC Number: 20 - 966657

Page 1 of 1

Contact and company name below will appear on the final report

Report To Company: <u>Clean Harbors Canada</u> Contact: <u>Todd Todd, Stan Yuba</u> Phone: <u>780 663-2513</u> Company address below will appear on the final report Street: <u>P.O. Box 390, 5014 Royce Road T73</u> City/Province: <u>Edmonton, AB</u> Postal Code: <u>T6R 4A0</u>		Reports / Recipients Select Report Format: <input checked="" type="checkbox"/> PDF <input checked="" type="checkbox"/> EXCEL <input type="checkbox"/> EDD (DIGITAL) Merge QC/QCI Reports with COA <input type="checkbox"/> YES <input type="checkbox"/> NO <input type="checkbox"/> N/A <input type="checkbox"/> Compare Results to Criteria on Report - provide details below if box checked Select Distribution: <input type="checkbox"/> EMAIL <input type="checkbox"/> MAIL <input type="checkbox"/> FAX Email 1 or Fax: <u>webb.todd@cleanharbors.com</u> Email 2: <u>yuba.stan@cleanharbors.com</u> Email 3:		Turnaround Time (TAT) Requested <input type="checkbox"/> Routine [R] if received by 3pm M-F - no surcharges apply <input checked="" type="checkbox"/> 1 day [1D] if received by 3pm M-F - 20% rush surcharge minimum <input type="checkbox"/> 3 day [3D] if received by 3pm M-F - 25% rush surcharge minimum <input type="checkbox"/> 2 day [2D] if received by 3pm M-F - 50% rush surcharge minimum <input type="checkbox"/> 1 day [E] if received by 3pm M-F - 100% rush surcharge minimum <input type="checkbox"/> Same day [Z] if received by 10am M-S - 200% rush surcharge. Additional fees may apply to rush requests on weekends, statutory holidays and non-routine tests.							
Company: <u>Clean Harbors Canada</u> Contact: <u>Todd Todd</u> Project Information ALS Account # / Quote #: <u>Q 82442 (Table 4.3B)</u> Job #: <u>Pond B + C</u> PO / AFE: <u>Table 4.3B</u> LSD:		Invoice To Same as Report To <input type="checkbox"/> YES <input type="checkbox"/> NO Copy of Invoice with Report <input type="checkbox"/> YES <input type="checkbox"/> NO Select Invoice Distribution: <input type="checkbox"/> EMAIL <input type="checkbox"/> MAIL <input type="checkbox"/> FAX Email 1 or Fax: <u>gooding.robbi@cleanharbors.com</u> Email 2:		Invoice Recipients Select Invoice Distribution: <input type="checkbox"/> EMAIL <input type="checkbox"/> MAIL <input type="checkbox"/> FAX Email 1 or Fax: <u>gooding.robbi@cleanharbors.com</u> Email 2:							
ALS Lab Work Order # (ALS use only): <u>ES 2202394</u> ALS Sample # (ALS use only):		Sample Identification and/or Coordinates (This description will appear on the report) Pond B Pond C		ALS Contact: <u>Pamela Toledo</u> Date: <u>11-Apr-22</u> Time: <u>11:30</u> (hh:mm) Sampler: <u>Todd</u> Sample Type: <u>water</u>							
Drinking Water (DW) Samples (client use) Are samples taken from a Regulated DW System? <input type="checkbox"/> YES <input type="checkbox"/> NO Are samples for human consumption/ use? <input type="checkbox"/> YES <input type="checkbox"/> NO		Notes / Specify Limits for result evaluation by selecting from drop-down below (Excel COC only) <u>Please analyze as per Table 4.3B + Daphnia (attached)</u> <u>Quote Q 82442</u> <u>Please rush analysis</u>		NUMBER OF CONTAINERS <table border="1"> <tr> <td>Table 4.3B</td> <td>✓</td> </tr> <tr> <td>Daphnia Maxon 48hr</td> <td>✓</td> </tr> <tr> <td>Static acute lethality test</td> <td>✓</td> </tr> </table>		Table 4.3B	✓	Daphnia Maxon 48hr	✓	Static acute lethality test	✓
Table 4.3B	✓										
Daphnia Maxon 48hr	✓										
Static acute lethality test	✓										
SHIPPING RELEASE (client use) Released by: <u>[Signature]</u> Date: <u>Apr 11/2022</u> Time: <u>13:00</u>		INITIAL SHIPMENT RECEPTION (ALS use only) Received by: <u>[Signature]</u> Date: <u>Apr 11/2022</u> Time: <u>13:00</u>		ANALYSIS REQUEST Indicate Filtered (F), Preserved (P) or Filtered and Preserved (FP) below <table border="1"> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> </table>							
SAMPLE RECEIPT DETAILS (ALS use only) Cooling Method: <input type="checkbox"/> NONE <input type="checkbox"/> ICE <input checked="" type="checkbox"/> ICE PACKS <input type="checkbox"/> ROZEM <input type="checkbox"/> COOLING INITIATED Submission Comments Identified on Sample Receipt Notification: <input type="checkbox"/> YES <input type="checkbox"/> NO Cooler Custody Seals Intact: <input type="checkbox"/> YES <input type="checkbox"/> N/A Sample Custody Seals Intact: <input type="checkbox"/> YES <input type="checkbox"/> N/A INITIAL COOLER TEMPERATURES °C: <u>6.1</u> FINAL COOLER TEMPERATURES °C:		FINAL SHIPMENT RECEPTION (ALS use only) Received by: <u>[Signature]</u> Date: <u>Apr 11/2022</u> Time: <u>2:24pm</u>		AMPLS ON HOLD <input type="checkbox"/> EXTENDED STORAGE REQUIRED <input type="checkbox"/> SUSPECTED HAZARD (see notes)							

Telephone : + 1 780 413 6227



Environmental Division
Edmonton
Work Order Reference
EO2202394

REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION
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 DW COC form.

TABLE 4.3-B: RUNOFF LIMITS FOR SURFACE WATER DETENTION POND

PARAMETER	LIMITS Maximum unless otherwise indicated
pH	6.0 – 9.5 pH units
COD	50 mg/L
TDS	2500 mg/L
TSS	25 mg/L
Ammonia (expressed as Nitrogen)	5 mg/L
Chloride	250 mg/L
Sodium	200 mg/L
Sulphate	500 mg/L
Oil or other substances	Not present in amounts sufficient to create a visible film or sheen
96-Hour Multiple Concentration Acute Lethality Test Using Rainbow Trout (<i>Oncorhynchus mykiss</i>)	50% or greater survival

48 hr Static Acute Lethality test using *Daphnia Magna*

Appendix B
Pond C
Analytical Report
May 2022



CERTIFICATE OF ANALYSIS (GUIDELINE EVALUATION)

Work Order : **EO2203075**
Client : **Clean Harbors Environmental Services, Inc.**
Contact : Todd Webb
Address : PO Box 390, 50114 Rame Road 173
AB Canada T0B4A0
Telephone : 780 663 2513
Project : Pond C MAY 5
PO : 224602
C-O-C number : ----
Sampler : ----
Site : TABLE 4.3B
Quote number : Q82439 / Q82442
No. of samples received : 1
No. of samples analysed : 1

Page : 1 of 3
Laboratory : Edmonton - Environmental
Account Manager : Pamela Toledo
Address : 9450 - 17 Avenue NW
Edmonton, Alberta Canada T6N 1M9
Telephone : +1 780 413 5227
Date Samples Received : 05-May-2022 15:47
Date Analysis Commenced : 05-May-2022
Issue Date : 26-May-2022 18:17

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
- Guideline Comparison

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>
Alex Drake	Lab Analyst	Inorganics, Edmonton, Alberta
Angeli Marzan	Lab Analyst	Inorganics, Edmonton, Alberta
Austin Wasylshyn	Lab Analyst	Metals, Edmonton, Alberta
Dan Nguyen	Team Leader - Inorganics	Inorganics, Edmonton, Alberta
Geoff Berg	Lab Analyst	Organics, Edmonton, Alberta
Muzammil Ali	Lab Analyst	Inorganics, Edmonton, Alberta
Pamela Toledo	Account Manager	External Subcontracting, Calgary, 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.

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QA/QC Compliance Assessment to assist with Quality Review and Sample Receipt Notification.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Application of guidelines is provided "as is" without warranty of any kind, either expressed or implied, including, but not limited to fitness for a particular purpose, or non-infringement. ALS assumes no responsibility for errors or omissions in the information. Guidelines are not adjusted for the hardness, pH or temperature of the sample (the most conservative values are used). Measurement uncertainty is not applied to test results prior to comparison with specified criteria values.

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

<i>Unit</i>	<i>Description</i>
-------------	--------------------

>: greater than.

<: less than.

Red shading is applied where the result is greater than the Guideline Upper Limit or the result is lower than the Guideline Lower Limit.

For drinking water samples, Red shading is applied where the result for E.coli, fecal or total coliforms is greater than or equal to the Guideline Upper Limit.



No Breaches Found



CERTIFICATE OF ANALYSIS

Work Order : **EO2203075**
Client : **Clean Harbors Environmental Services, Inc.**
Contact : Todd Webb
Address : PO Box 390, 50114 Rame Road 173
AB Canada T0B4A0
Telephone : 780 663 2513
Project : Pond C MAY 5
PO : 224602
C-O-C number : ----
Sampler : ----
Site : TABLE 4.3B
Quote number : Q82439 / Q82442
No. of samples received : 1
No. of samples analysed : 1

Page : 1 of 4
Laboratory : Edmonton - Environmental
Account Manager : Pamela Toledo
Address : 9450 - 17 Avenue NW
Edmonton AB Canada T6N 1M9
Telephone : +1 780 413 5227
Date Samples Received : 05-May-2022 15:47
Date Analysis Commenced : 05-May-2022
Issue Date : 26-May-2022 18:17

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.

<i>Signatories</i>	<i>Position</i>	<i>Laboratory Department</i>
Alex Drake	Lab Analyst	Inorganics, Edmonton, Alberta
Angeli Marzan	Lab Analyst	Inorganics, Edmonton, Alberta
Austin Wasylshyn	Lab Analyst	Metals, Edmonton, Alberta
Dan Nguyen	Team Leader - Inorganics	Inorganics, Edmonton, Alberta
Geoff Berg	Lab Analyst	Organics, Edmonton, Alberta
Muzammil Ali	Lab Analyst	Inorganics, Edmonton, Alberta
Pamela Toledo	Account Manager	External Subcontracting, Calgary, 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).

<i>Unit</i>	<i>Description</i>
-	No Unit
mg/L	milligrams per litre
pH units	pH 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.



Analytical Results

Sub-Matrix: Water					Client sample ID	Pond C	----	----	----	----
(Matrix: Water)					Client sampling date / time	05-May-2022 13:15	----	----	----	----
Analyte	CAS Number	Method	LOR	Unit	EO2203075-001	-----	-----	-----	-----	
					Result	----	----	----	----	
Physical Tests										
pH	----	E108	0.10	pH units	8.34	----	----	----	----	
solids, total dissolved [TDS]	----	E162	10	mg/L	739	----	----	----	----	
solids, total suspended [TSS]	----	E160	3.0	mg/L	7.8	----	----	----	----	
Anions and Nutrients										
ammonia, total (as N)	7664-41-7	E298	0.0050	mg/L	0.0224	----	----	----	----	
chloride	16887-00-6	E235.Cl	0.50	mg/L	57.0	----	----	----	----	
sulfate (as SO4)	14808-79-8	E235.SO4	0.30	mg/L	356	----	----	----	----	
Bioassays										
Daphnia magna LC50	----	DAP-LC50-48	-	-	See attached	----	----	----	----	
trout bioassay LC50	----	TRT-LC50-96	-	-	See attached	----	----	----	----	
Total Metals										
aluminum, total	7429-90-5	E420	0.0030	mg/L	0.0374	----	----	----	----	
antimony, total	7440-36-0	E420	0.00010	mg/L	0.00044	----	----	----	----	
arsenic, total	7440-38-2	E420	0.00010	mg/L	0.00132	----	----	----	----	
barium, total	7440-39-3	E420	0.00010	mg/L	0.0420	----	----	----	----	
beryllium, total	7440-41-7	E420	0.000020	mg/L	<0.000020	----	----	----	----	
bismuth, total	7440-69-9	E420	0.000050	mg/L	<0.000050	----	----	----	----	
boron, total	7440-42-8	E420	0.010	mg/L	0.073	----	----	----	----	
cadmium, total	7440-43-9	E420	0.0000050	mg/L	0.0000382	----	----	----	----	
calcium, total	7440-70-2	E420	0.050	mg/L	40.3	----	----	----	----	
cesium, total	7440-46-2	E420	0.000010	mg/L	0.000052	----	----	----	----	
chromium, total	7440-47-3	E420	0.00050	mg/L	0.00067	----	----	----	----	
cobalt, total	7440-48-4	E420	0.00010	mg/L	0.00026	----	----	----	----	
copper, total	7440-50-8	E420	0.00050	mg/L	0.00690	----	----	----	----	
iron, total	7439-89-6	E420	0.010	mg/L	0.043	----	----	----	----	
lead, total	7439-92-1	E420	0.000050	mg/L	0.000141	----	----	----	----	
lithium, total	7439-93-2	E420	0.0010	mg/L	0.0313	----	----	----	----	
magnesium, total	7439-95-4	E420	0.0050	mg/L	15.7	----	----	----	----	
manganese, total	7439-96-5	E420	0.00010	mg/L	0.00777	----	----	----	----	



Analytical Results

Sub-Matrix: Water					Client sample ID	Pond C	----	----	----	----
(Matrix: Water)					Client sampling date / time	05-May-2022 13:15	----	----	----	----
Analyte	CAS Number	Method	LOR	Unit	EO2203075-001	-----	-----	-----	-----	
					Result	---	---	---	---	
Total Metals										
molybdenum, total	7439-98-7	E420	0.000050	mg/L	0.0890	----	----	----	----	
nickel, total	7440-02-0	E420	0.000050	mg/L	0.0114	----	----	----	----	
phosphorus, total	7723-14-0	E420	0.050	mg/L	<0.050	----	----	----	----	
potassium, total	7440-09-7	E420	0.050	mg/L	4.94	----	----	----	----	
rubidium, total	7440-17-7	E420	0.00020	mg/L	0.00144	----	----	----	----	
selenium, total	7782-49-2	E420	0.000050	mg/L	0.000452	----	----	----	----	
silicon, total	7440-21-3	E420	0.10	mg/L	0.90	----	----	----	----	
silver, total	7440-22-4	E420	0.000010	mg/L	<0.000010	----	----	----	----	
sodium, total	7440-23-5	E420	0.050	mg/L	170	----	----	----	----	
strontium, total	7440-24-6	E420	0.00020	mg/L	0.395	----	----	----	----	
sulfur, total	7704-34-9	E420	0.50	mg/L	121	----	----	----	----	
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	0.00064	----	----	----	----	
tungsten, total	7440-33-7	E420	0.00010	mg/L	0.00098	----	----	----	----	
uranium, total	7440-61-1	E420	0.000010	mg/L	0.00359	----	----	----	----	
vanadium, total	7440-62-2	E420	0.00050	mg/L	0.0624	----	----	----	----	
zinc, total	7440-66-6	E420	0.0030	mg/L	0.0090	----	----	----	----	
zirconium, total	7440-67-7	E420	0.00020	mg/L	0.00027	----	----	----	----	
Aggregate Organics										
chemical oxygen demand [COD]	----	E559-L	10	mg/L	43	----	----	----	----	
oil & grease (visible sheen)	----	E566	-	-	Absent	----	----	----	----	

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

QUALITY CONTROL INTERPRETIVE REPORT

Work Order	: EO2203075	Page	: 1 of 7
Client	: Clean Harbors Environmental Services, Inc.	Laboratory	: Edmonton - Environmental
Contact	: Todd Webb	Account Manager	: Pamela Toledo
Address	: PO Box 390, 50114 Rame Road 173 AB Canada T0B4A0	Address	: 9450 - 17 Avenue NW Edmonton, Alberta Canada T6N 1M9
Telephone	: 780 663 2513	Telephone	: +1 780 413 5227
Project	: Pond C MAY 5	Date Samples Received	: 05-May-2022 15:47
PO	: 224602	Issue Date	: 26-May-2022 18:18
C-O-C number	: ----		
Sampler	: ----		
Site	: TABLE 4.3B		
Quote number	: Q82439 / Q82442		
No. of samples received	: 1		
No. of samples analysed	: 1		

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)

- Analysis Holding Time Outliers exist - please see following pages for full details.

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	
Aggregate Organics : Chemical Oxygen Demand by Colourimetry (Low Level)										
Amber glass total (sulfuric acid) Pond C	E559-L	05-May-2022	----	----	----		10-May-2022	28 days	5 days	✓
Aggregate Organics : Oil & Grease by Visible Sheen										
Amber glass (hydrochloric acid) Pond C	E566	05-May-2022	----	----	----		10-May-2022	28 days	5 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid) Pond C	E298	05-May-2022	05-May-2022	----	----		06-May-2022	28 days	1 days	✓
Anions and Nutrients : Chloride in Water by IC										
HDPE Pond C	E235.Cl	05-May-2022	----	----	----		05-May-2022	28 days	0 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE Pond C	E235.SO4	05-May-2022	----	----	----		05-May-2022	28 days	0 days	✓
Bioassays : Survival/LC50 Daphnia Magna 48 hours										
HDPE Pond C	DAP-LC50-48	05-May-2022	----	----	----		26-May-2022	5 days	21 days	* EHT
Bioassays : Survival/LC50 Rainbow Trout (96 hours)										
LDPE carboy Pond C	TRT-LC50-96	05-May-2022	----	----	----		26-May-2022	5 days	21 days	* EHT



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	
Physical Tests : pH by Meter										
HDPE Pond C	E108	05-May-2022	----	----	----		05-May-2022	0.25 hrs	3 hrs	* EHTR-FM
Physical Tests : TDS by Gravimetry										
HDPE Pond C	E162	05-May-2022	----	----	----		11-May-2022	7 days	6 days	✓
Physical Tests : TSS by Gravimetry										
HDPE Pond C	E160	05-May-2022	----	----	----		10-May-2022	7 days	5 days	✓
Total Metals : Total Metals in Water by CRC ICPMS										
HDPE Pond C	E420	05-May-2022	----	----	----		09-May-2022	180 days	4 days	✓

Legend & Qualifier Definitions

EHTR-FM: Exceeded ALS recommended hold time prior to sample receipt. Field Measurement recommended

EHT: Exceeded ALS recommended hold time prior to analysis.

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	Method	QC Lot #	Count		Frequency (%)		Evaluation
			QC	Regular	Actual	Expected	
Analytical Methods							
Laboratory Duplicates (DUP)							
Ammonia by Fluorescence	E298	478724	1	20	5.0	5.0	✓
Chemical Oxygen Demand by Colourimetry (Low Level)	E559-L	482670	1	18	5.5	5.0	✓
Chloride in Water by IC	E235.Cl	478576	1	20	5.0	5.0	✓
pH by Meter	E108	478642	1	9	11.1	5.0	✓
Sulfate in Water by IC	E235.SO4	478575	1	20	5.0	5.0	✓
TDS by Gravimetry	E162	483753	1	15	6.6	5.0	✓
Total Metals in Water by CRC ICPMS	E420	481444	1	19	5.2	5.0	✓
TSS by Gravimetry	E160	483119	1	20	5.0	5.0	✓
Laboratory Control Samples (LCS)							
Ammonia by Fluorescence	E298	478724	1	20	5.0	5.0	✓
Chemical Oxygen Demand by Colourimetry (Low Level)	E559-L	482670	1	18	5.5	5.0	✓
Chloride in Water by IC	E235.Cl	478576	1	20	5.0	5.0	✓
pH by Meter	E108	478642	1	9	11.1	5.0	✓
Sulfate in Water by IC	E235.SO4	478575	1	20	5.0	5.0	✓
TDS by Gravimetry	E162	483753	1	15	6.6	5.0	✓
Total Metals in Water by CRC ICPMS	E420	481444	1	19	5.2	5.0	✓
TSS by Gravimetry	E160	483119	1	20	5.0	5.0	✓
Method Blanks (MB)							
Ammonia by Fluorescence	E298	478724	1	20	5.0	5.0	✓
Chemical Oxygen Demand by Colourimetry (Low Level)	E559-L	482670	1	18	5.5	5.0	✓
Chloride in Water by IC	E235.Cl	478576	1	20	5.0	5.0	✓
Sulfate in Water by IC	E235.SO4	478575	1	20	5.0	5.0	✓
TDS by Gravimetry	E162	483753	1	15	6.6	5.0	✓
Total Metals in Water by CRC ICPMS	E420	481444	1	19	5.2	5.0	✓
TSS by Gravimetry	E160	483119	1	20	5.0	5.0	✓
Matrix Spikes (MS)							
Ammonia by Fluorescence	E298	478724	1	20	5.0	5.0	✓
Chemical Oxygen Demand by Colourimetry (Low Level)	E559-L	482670	1	18	5.5	5.0	✓
Chloride in Water by IC	E235.Cl	478576	1	20	5.0	5.0	✓
Sulfate in Water by IC	E235.SO4	478575	1	20	5.0	5.0	✓
Total Metals in Water by CRC ICPMS	E420	481444	1	19	5.2	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
Survival/LC50 Daphnia Magna 48 hours	DAP-LC50-48 Nautilus Environmental (Calgary) - 10828 27 Street SE Calgary Alberta Canada T2Z 3V9	Water	EPS1/RM/14	See attached report.
pH by Meter	E108 Edmonton - Environmental	Water	APHA 4500-H (mod)	pH is determined by potentiometric measurement with a pH electrode, and is conducted at ambient laboratory temperature (normally $20 \pm 5^\circ\text{C}$). For high accuracy test results, pH should be measured in the field within the recommended 15 minute hold time.
TSS by Gravimetry	E160 Edmonton - Environmental	Water	APHA 2540 D (mod)	Total Suspended Solids (TSS) are determined by filtering a sample through a glass fibre filter, following by drying of the filter at $104 \pm 1^\circ\text{C}$, with gravimetric measurement of the filtered solids. Samples containing very high dissolved solid content (i.e. seawaters, brackish waters) may produce a positive bias by this method. Alternate analysis methods are available for these types of samples.
TDS by Gravimetry	E162 Edmonton - Environmental	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.
Chloride in Water by IC	E235.Cl Edmonton - Environmental	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Sulfate in Water by IC	E235.SO4 Edmonton - Environmental	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Ammonia by Fluorescence	E298 Edmonton - Environmental	Water	J. Environ. Monit., 2005, 7, 37-42 (mod)	Ammonia in water is analyzed by flow-injection analysis with fluorescence detection after reaction with orthophthaldialdehyde (OPA).
Total Metals in Water by CRC ICPMS	E420 Edmonton - Environmental	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.
Chemical Oxygen Demand by Colourimetry (Low Level)	E559-L Edmonton - Environmental	Water	APHA 5220 D (mod)	Samples are analyzed using the closed reflux colourimetric method.



<i>Analytical Methods</i>	<i>Method / Lab</i>	<i>Matrix</i>	<i>Method Reference</i>	<i>Method Descriptions</i>
Oil & Grease by Visible Sheen	E566 Edmonton - Environmental	Water	Alberta Energy Regulator, Drilling waste Management, Directive 050, July 2016	Use a qualitative visual observation of rainbow sheen to determine the presence or absence of oil and grease on water.
Survival/LC50 Rainbow Trout (96 hours)	TRT-LC50-96 Nautilus Environmental (Calgary) - 10828 27 Street SE Calgary Alberta Canada T2Z 3V9	Water	EPS1/RM/13	See attached report.
<i>Preparation Methods</i>	<i>Method / Lab</i>	<i>Matrix</i>	<i>Method Reference</i>	<i>Method Descriptions</i>
Preparation for Ammonia	EP298 Edmonton - Environmental	Water		Sample preparation for Preserved Nutrients Water Quality Analysis.



QUALITY CONTROL REPORT

Work Order	: EO2203075	Page	: 1 of 10
Client	: Clean Harbors Environmental Services, Inc.	Laboratory	: Edmonton - Environmental
Contact	: Todd Webb	Account Manager	: Pamela Toledo
Address	: PO Box 390, 50114 Rame Road 173 AB Canada T0B4A0	Address	: 9450 - 17 Avenue NW Edmonton, Alberta Canada T6N 1M9
Telephone	: 780 663 2513	Telephone	: +1 780 413 5227
Project	: Pond C MAY 5	Date Samples Received	: 05-May-2022 15:47
PO	: 224602	Date Analysis Commenced	: 05-May-2022
C-O-C number	: ----	Issue Date	: 26-May-2022 18:17
Sampler	: ----		
Site	: TABLE 4.3B		
Quote number	: Q82439 / Q82442		
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.

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.

<i>Signatories</i>	<i>Position</i>	<i>Laboratory Department</i>
Alex Drake	Lab Analyst	Edmonton Inorganics, Edmonton, Alberta
Angeli Marzan	Lab Analyst	Edmonton Inorganics, Edmonton, Alberta
Austin Wasylyshyn	Lab Analyst	Edmonton Metals, Edmonton, Alberta
Dan Nguyen	Team Leader - Inorganics	Edmonton Inorganics, Edmonton, Alberta
Geoff Berg	Lab Analyst	Edmonton Organics, Edmonton, Alberta
Muzammil Ali	Lab Analyst	Edmonton Inorganics, Edmonton, Alberta
Pamela Toledo	Account Manager	Nautilus Environmental (Calgary) External Subcontracting, Calgary, Alberta
Shruti Mudliar	Lab Analyst	Edmonton Inorganics, Edmonton, Alberta

Page : 2 of 10
Work Order : EO2203075
Client : Clean Harbors Environmental Services, Inc.
Project : Pond C MAY 5



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

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



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: 478642)											
EO2203054-001	Anonymous	pH	----	E108	0.10	pH units	8.00	8.00	0.00%	3%	----
Physical Tests (QC Lot: 483119)											
EO2203075-001	Pond C	solids, total suspended [TSS]	----	E160	3.0	mg/L	7.8	6.8	1.0	Diff <2x LOR	----
Physical Tests (QC Lot: 483753)											
EO2203071-001	Anonymous	solids, total dissolved [TDS]	----	E162	20	mg/L	2700	2710	0.555%	20%	----
Anions and Nutrients (QC Lot: 478575)											
EO2203048-010	Anonymous	sulfate (as SO4)	14808-79-8	E235.SO4	0.30	mg/L	94.0	95.0	1.16%	20%	----
Anions and Nutrients (QC Lot: 478576)											
EO2203048-010	Anonymous	chloride	16887-00-6	E235.Cl	0.50	mg/L	31.8	32.0	0.806%	20%	----
Anions and Nutrients (QC Lot: 478724)											
FC2200856-006	Anonymous	ammonia, total (as N)	7664-41-7	E298	0.0050	mg/L	0.0496	0.0499	0.0003	Diff <2x LOR	----
Total Metals (QC Lot: 481444)											
EO2202995-005	Anonymous	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	0.00092	0.00096	0.00004	Diff <2x LOR	----
		barium, total	7440-39-3	E420	0.00010	mg/L	0.00323	0.00337	4.21%	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	----
		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	0.0000303	0.0000264	0.0000039	Diff <2x LOR	----
		calcium, total	7440-70-2	E420	0.050	mg/L	1.12	1.16	3.57%	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	0.000050	mg/L	<0.000050	<0.000050	0	Diff <2x LOR	----
		cobalt, total	7440-48-4	E420	0.00010	mg/L	0.00048	0.00050	0.00001	Diff <2x LOR	----
		copper, total	7440-50-8	E420	0.000050	mg/L	0.0202	0.0234	14.9%	20%	----
		lead, total	7439-92-1	E420	0.000050	mg/L	<0.000050	0.000068	0.000018	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	0.520	0.560	7.34%	20%	----
		manganese, total	7439-96-5	E420	0.00010	mg/L	0.0130	0.0140	6.90%	20%	----
		molybdenum, total	7439-98-7	E420	0.000050	mg/L	<0.000050	<0.000050	0	Diff <2x LOR	----
		nickel, total	7440-02-0	E420	0.000050	mg/L	0.00064	0.00068	0.00004	Diff <2x LOR	----
		phosphorus, total	7723-14-0	E420	0.050	mg/L	1.32	1.45	9.39%	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
Total Metals (QC Lot: 481444) - continued											
EO2202995-005	Anonymous	potassium, total	7440-09-7	E420	0.050	mg/L	1.85	1.94	4.84%	20%	----
		rubidium, total	7440-17-7	E420	0.00020	mg/L	0.00152	0.00163	0.00011	Diff <2x LOR	----
		selenium, total	7782-49-2	E420	0.000050	mg/L	0.000064	0.000058	0.000005	Diff <2x LOR	----
		silicon, total	7440-21-3	E420	0.10	mg/L	0.10	0.12	0.02	Diff <2x LOR	----
		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	3.46	3.53	2.04%	20%	----
		strontium, total	7440-24-6	E420	0.00020	mg/L	0.00406	0.00420	3.41%	20%	----
		sulfur, total	7704-34-9	E420	0.50	mg/L	0.83	0.75	0.08	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	0.000012	0.000011	0.0000009	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	0.00050	0.00054	0.00004	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	<0.000010	<0.000010	0	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	0.0403	0.0434	7.36%	20%	----
		zirconium, total	7440-67-7	E420	0.00020	mg/L	<0.00020	<0.00020	0	Diff <2x LOR	----
Aggregate Organics (QC Lot: 482670)											
EO2203001-001	Anonymous	chemical oxygen demand [COD]	----	E559-L	10	mg/L	147	148	0.360%	20%	----



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: 483119)						
solids, total suspended [TSS]	----	E160	3	mg/L	<3.0	----
Physical Tests (QCLot: 483753)						
solids, total dissolved [TDS]	----	E162	10	mg/L	<10	----
Anions and Nutrients (QCLot: 478575)						
sulfate (as SO4)	14808-79-8	E235.SO4	0.3	mg/L	<0.30	----
Anions and Nutrients (QCLot: 478576)						
chloride	16887-00-6	E235.Cl	0.5	mg/L	<0.50	----
Anions and Nutrients (QCLot: 478724)						
ammonia, total (as N)	7664-41-7	E298	0.005	mg/L	<0.0050	----
Total Metals (QCLot: 481444)						
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	----
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	----



Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Total Metals (QCLot: 481444) - continued						
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	----
Aggregate Organics (QCLot: 482670)						
chemical oxygen demand [COD]	----	E559-L	10	mg/L	<10	----



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				
Analyte	CAS Number	Method	LOR	Unit	Spike	Recovery (%)	Recovery Limits (%)		Qualifier
					Concentration	LCS	Low	High	
Physical Tests (QCLot: 478642)									
pH	----	E108	----	pH units	6 pH units	101	97.0	103	----
Physical Tests (QCLot: 483119)									
solids, total suspended [TSS]	----	E160	3	mg/L	150 mg/L	97.5	85.0	115	----
Physical Tests (QCLot: 483753)									
solids, total dissolved [TDS]	----	E162	10	mg/L	1000 mg/L	98.9	85.0	115	----
Anions and Nutrients (QCLot: 478575)									
sulfate (as SO4)	14808-79-8	E235.SO4	0.3	mg/L	100 mg/L	104	90.0	110	----
Anions and Nutrients (QCLot: 478576)									
chloride	16887-00-6	E235.Cl	0.5	mg/L	100 mg/L	99.9	90.0	110	----
Anions and Nutrients (QCLot: 478724)									
ammonia, total (as N)	7664-41-7	E298	0.005	mg/L	0.2 mg/L	93.0	85.0	115	----
Total Metals (QCLot: 481444)									
aluminum, total	7429-90-5	E420	0.003	mg/L	2 mg/L	100	80.0	120	----
antimony, total	7440-36-0	E420	0.0001	mg/L	1 mg/L	97.4	80.0	120	----
arsenic, total	7440-38-2	E420	0.0001	mg/L	1 mg/L	93.5	80.0	120	----
barium, total	7440-39-3	E420	0.0001	mg/L	0.25 mg/L	100	80.0	120	----
beryllium, total	7440-41-7	E420	0.00002	mg/L	0.1 mg/L	97.2	80.0	120	----
bismuth, total	7440-69-9	E420	0.00005	mg/L	1 mg/L	97.2	80.0	120	----
boron, total	7440-42-8	E420	0.01	mg/L	1 mg/L	91.0	80.0	120	----
cadmium, total	7440-43-9	E420	0.000005	mg/L	0.1 mg/L	97.0	80.0	120	----
calcium, total	7440-70-2	E420	0.05	mg/L	50 mg/L	99.2	80.0	120	----
cesium, total	7440-46-2	E420	0.00001	mg/L	0.05 mg/L	96.9	80.0	120	----
chromium, total	7440-47-3	E420	0.0005	mg/L	0.25 mg/L	99.4	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	98.7	80.0	120	----
iron, total	7439-89-6	E420	0.01	mg/L	1 mg/L	98.7	80.0	120	----
lead, total	7439-92-1	E420	0.00005	mg/L	0.5 mg/L	99.8	80.0	120	----
lithium, total	7439-93-2	E420	0.001	mg/L	0.25 mg/L	101	80.0	120	----
magnesium, total	7439-95-4	E420	0.005	mg/L	50 mg/L	96.3	80.0	120	----
manganese, total	7439-96-5	E420	0.0001	mg/L	0.25 mg/L	101	80.0	120	----
molybdenum, total	7439-98-7	E420	0.00005	mg/L	0.25 mg/L	96.7	80.0	120	----
nickel, total	7440-02-0	E420	0.0005	mg/L	0.5 mg/L	96.7	80.0	120	----



Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		Qualifier
					Concentration	LCS	Low	High	
Total Metals (QCLot: 481444) - continued									
phosphorus, total	7723-14-0	E420	0.05	mg/L	10 mg/L	98.5	80.0	120	----
potassium, total	7440-09-7	E420	0.05	mg/L	50 mg/L	101	80.0	120	----
rubidium, total	7440-17-7	E420	0.0002	mg/L	0.1 mg/L	99.8	80.0	120	----
selenium, total	7782-49-2	E420	0.00005	mg/L	1 mg/L	92.7	80.0	120	----
silicon, total	7440-21-3	E420	0.1	mg/L	10 mg/L	95.8	80.0	120	----
silver, total	7440-22-4	E420	0.00001	mg/L	0.1 mg/L	93.1	80.0	120	----
sodium, total	7440-23-5	E420	0.05	mg/L	50 mg/L	101	80.0	120	----
strontium, total	7440-24-6	E420	0.0002	mg/L	0.25 mg/L	103	80.0	120	----
sulfur, total	7704-34-9	E420	0.5	mg/L	50 mg/L	88.3	80.0	120	----
tellurium, total	13494-80-9	E420	0.0002	mg/L	0.1 mg/L	89.7	80.0	120	----
thallium, total	7440-28-0	E420	0.00001	mg/L	1 mg/L	98.8	80.0	120	----
thorium, total	7440-29-1	E420	0.0001	mg/L	0.1 mg/L	95.3	80.0	120	----
tin, total	7440-31-5	E420	0.0001	mg/L	0.5 mg/L	91.7	80.0	120	----
titanium, total	7440-32-6	E420	0.0003	mg/L	0.25 mg/L	93.5	80.0	120	----
tungsten, total	7440-33-7	E420	0.0001	mg/L	0.1 mg/L	95.5	80.0	120	----
uranium, total	7440-61-1	E420	0.00001	mg/L	0.005 mg/L	99.1	80.0	120	----
vanadium, total	7440-62-2	E420	0.0005	mg/L	0.5 mg/L	99.4	80.0	120	----
zinc, total	7440-66-6	E420	0.003	mg/L	0.5 mg/L	97.9	80.0	120	----
zirconium, total	7440-67-7	E420	0.0002	mg/L	0.1 mg/L	94.3	80.0	120	----
Aggregate Organics (QCLot: 482670)									
chemical oxygen demand [COD]	----	E559-L	10	mg/L	100 mg/L	96.4	85.0	115	----



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 $\geq 1x$ spike level.

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
Anions and Nutrients (QCLot: 478575)										
EO2203048-010	Anonymous	sulfate (as SO4)	14808-79-8	E235.SO4	91.2 mg/L	100 mg/L	91.2	75.0	125	----
Anions and Nutrients (QCLot: 478576)										
EO2203048-010	Anonymous	chloride	16887-00-6	E235.Cl	92.6 mg/L	100 mg/L	92.6	75.0	125	----
Anions and Nutrients (QCLot: 478724)										
FC2200856-006	Anonymous	ammonia, total (as N)	7664-41-7	E298	0.0890 mg/L	0.1 mg/L	89.0	75.0	125	----
Total Metals (QCLot: 481444)										
EO2202995-006	Anonymous	aluminum, total	7429-90-5	E420	0.191 mg/L	0.2 mg/L	95.4	70.0	130	----
		antimony, total	7440-36-0	E420	0.0210 mg/L	0.02 mg/L	105	70.0	130	----
		arsenic, total	7440-38-2	E420	0.0200 mg/L	0.02 mg/L	99.9	70.0	130	----
		barium, total	7440-39-3	E420	0.0198 mg/L	0.02 mg/L	98.8	70.0	130	----
		beryllium, total	7440-41-7	E420	0.0422 mg/L	0.04 mg/L	105	70.0	130	----
		bismuth, total	7440-69-9	E420	0.0107 mg/L	0.01 mg/L	107	70.0	130	----
		boron, total	7440-42-8	E420	0.108 mg/L	0.1 mg/L	108	70.0	130	----
		cadmium, total	7440-43-9	E420	0.00392 mg/L	0.004 mg/L	98.0	70.0	130	----
		calcium, total	7440-70-2	E420	3.88 mg/L	4 mg/L	97.0	70.0	130	----
		cesium, total	7440-46-2	E420	0.00999 mg/L	0.01 mg/L	99.9	70.0	130	----
		chromium, total	7440-47-3	E420	0.0397 mg/L	0.04 mg/L	99.2	70.0	130	----
		cobalt, total	7440-48-4	E420	0.0197 mg/L	0.02 mg/L	98.3	70.0	130	----
		copper, total	7440-50-8	E420	0.0190 mg/L	0.02 mg/L	94.8	70.0	130	----
		iron, total	7439-89-6	E420	1.98 mg/L	2 mg/L	99.1	70.0	130	----
		lead, total	7439-92-1	E420	0.0212 mg/L	0.02 mg/L	106	70.0	130	----
		lithium, total	7439-93-2	E420	0.103 mg/L	0.1 mg/L	103	70.0	130	----
		magnesium, total	7439-95-4	E420	0.906 mg/L	1 mg/L	90.6	70.0	130	----
		manganese, total	7439-96-5	E420	0.0195 mg/L	0.02 mg/L	97.5	70.0	130	----
		molybdenum, total	7439-98-7	E420	0.0215 mg/L	0.02 mg/L	107	70.0	130	----
		nickel, total	7440-02-0	E420	0.0382 mg/L	0.04 mg/L	95.6	70.0	130	----
		phosphorus, total	7723-14-0	E420	9.80 mg/L	10 mg/L	98.0	70.0	130	----
		potassium, total	7440-09-7	E420	3.68 mg/L	4 mg/L	92.1	70.0	130	----
		rubidium, total	7440-17-7	E420	0.0192 mg/L	0.02 mg/L	96.2	70.0	130	----
		selenium, total	7782-49-2	E420	0.0427 mg/L	0.04 mg/L	107	70.0	130	----
		silicon, total	7440-21-3	E420	9.42 mg/L	10 mg/L	94.2	70.0	130	----
		silver, total	7440-22-4	E420	0.00407 mg/L	0.004 mg/L	102	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: 481444) - continued										
EO2202995-006	Anonymous	sodium, total	7440-23-5	E420	1.80 mg/L	2 mg/L	89.8	70.0	130	----
		strontium, total	7440-24-6	E420	0.0210 mg/L	0.02 mg/L	105	70.0	130	----
		sulfur, total	7704-34-9	E420	19.5 mg/L	20 mg/L	97.4	70.0	130	----
		tellurium, total	13494-80-9	E420	0.0423 mg/L	0.04 mg/L	106	70.0	130	----
		thallium, total	7440-28-0	E420	0.00412 mg/L	0.004 mg/L	103	70.0	130	----
		tin, total	7440-31-5	E420	0.0200 mg/L	0.02 mg/L	100	70.0	130	----
		titanium, total	7440-32-6	E420	0.0386 mg/L	0.04 mg/L	96.5	70.0	130	----
		tungsten, total	7440-33-7	E420	0.0214 mg/L	0.02 mg/L	107	70.0	130	----
		uranium, total	7440-61-1	E420	0.00412 mg/L	0.004 mg/L	103	70.0	130	----
		vanadium, total	7440-62-2	E420	0.0978 mg/L	0.1 mg/L	97.8	70.0	130	----
		zinc, total	7440-66-6	E420	0.374 mg/L	0.4 mg/L	93.5	70.0	130	----
		zirconium, total	7440-67-7	E420	0.0429 mg/L	0.04 mg/L	107	70.0	130	----
Aggregate Organics (QCLot: 482670)										
EO2203013-001	Anonymous	chemical oxygen demand [COD]	----	E559-L	ND mg/L	100 mg/L	ND	75.0	125	----



Acute Toxicity Test Results

Sample collected May 5, 2022

Final Report

May 26, 2022

Submitted to: **ALS Environmental**
Edmonton, AB

SAMPLE INFORMATION

Sample ID/ Internal ID	Dates				Receipt temperature
	Collected	Received	Rainbow trout test initiation	<i>Daphnia magna</i> test initiation	
EO2203075-001 2122-2120	5-May-22 at 1315h	6-May-22 at 0920h	6-May-22 at 1505h	6-May-22 at 1600h	16.6°C

TEST TYPES

- Rainbow trout 96-h LC50 test
- *Daphnia magna* 48-h LC50, EC50 test

RESULTS

Toxicity test results

Sample ID	LC50/EC50 (% v/v)		
	Rainbow trout	<i>Daphnia magna</i>	
	LC50	LC50	EC50
EO2203075-001	>100	>100	>100

LC = Lethal Concentration, EC= Effect Concentration

QA/QC

QA/QC summary	Rainbow trout	<i>Daphnia magna</i>
Reference toxicant LC50 (95% CL)	3.4 (3.0-3.9) g/L KCl ¹	6.3 (5.9 - 6.6) g/L NaCl ²
Reference toxicant historical mean (2 SD Range)	3.3 (2.5-4.4) g/L KCl	6.5 (5.6 - 7.6) g/L NaCl
Reference toxicant CV	9.4%	5.2%
Organism health history	Acceptable	Acceptable
Protocol deviations	None	None
Water quality range deviations	None	None
Control performance	Acceptable	Acceptable
Test performance	Valid	Valid

¹ Test date, May 5, 2022; ² Test Date May 10, 2022

LC = Lethal Concentration; CL = Confidence Limit, SD = Standard Deviation; CV = Coefficient of Variation



Report By:
Jacklyn Poole, BSc
Laboratory and Quality Manager



Reviewed By:
Tamara Pomeroy, BSc
Laboratory and Quality Manager

This report has been prepared by Nautilus Environmental Company Inc. based on data and/or samples provided by our client and the results of this study are for their sole benefit. Any reliance on the data by a third party is at the sole and exclusive risk of that party. The results presented here relate only to the samples tested.

APPENDIX A – Summary of test conditions

Table 1. Summary of test conditions: 96-h rainbow trout (*Oncorhynchus mykiss*) survival test.

Test species	<i>Oncorhynchus mykiss</i>
Organism source	Fish hatchery
Organism age	Juvenile
Test type	Static
Test duration	96 hours
Test vessel	5 gallon glass aquariums
Test volume	10 - 20 L, depending on size of fish
Test solution depth	Minimum 15 cm
Test concentrations	Five concentrations, plus laboratory control
Test replicates	1 per treatment
Number of organisms	10 per replicate
Control/dilution water	De-chlorinated City of Calgary tap water
Test solution renewal	None
Test temperature	15 ± 1°C
Feeding	None
Light intensity	100 to 500 lux
Photoperiod	16 hours light/8 hours dark
Aeration	6.5 ± 1 mL/min/L
Test Measurements	pH, conductivity, dissolved oxygen and temperature were measured at test initiation and test completion; salinity measured at test initiation; evaluated for survival daily
Test protocol	Environment Canada (2000), EPS 1/RM/13, with 2007 & 2016 amendments
Statistical software	None
Test endpoints	96-hour LC50
Test acceptability criteria for controls	Survival ≥ 90%
Reference toxicant	Potassium chloride (KCl)

Table 2. Summary of test conditions: 48-h *Daphnia magna* survival test.

Test species	<i>Daphnia magna</i>
Organism source	In-house culture
Organism age	<24 hours
Test type	Static
Test duration	48 hours
Test vessel	385 mL plastic vessels
Test volume	150 mL
Test concentrations	Five concentrations, plus laboratory control
Test replicates	1 per treatment
Number of organisms	10 per replicate
Control/dilution water	De-chlorinated City of Calgary tap water amended with 4 mg/L KCl and with B12 (2 µg/L) and Na ₂ SeO ₄ (2 µg Se/L)
Test solution renewal	None
Test temperature	20 ± 2°C
Feeding	None
Light intensity	400 to 800 lux
Photoperiod	16 hours light/8 hours dark
Aeration	None
Test measurements	pH, conductivity, dissolved oxygen and temperature measured at test initiation and completion; salinity and hardness measured at test initiation in undiluted sample; evaluated daily for survival
Test protocol	Environment Canada (2000), EPS 1/RM/14
Statistical software	None
Test endpoints	48-h LC50
Test acceptability criteria for controls	Survival ≥ 90%
Reference toxicant	Sodium chloride (NaCl)

APPENDIX B – Toxicity test data

Method TRD Client ALS106 Reference 2122-2120 Chamber 3

Test Log

Day	Date	Time	Initial	Chem. Cart	Daily Data Review	Sample Information
0	2022/05/06	1505 *	EP/NA	1	MAF	Initial pH: <u>8.4</u>
1	2022/05/07	0900	CH	-	MAF	Initial EC (µS/cm): <u>1153</u>
2	2022/05/08	0830	DM	-	MAF	Salinity (ppt): <u>1</u>
3	2022/05/09	0900	KCM	-	JCC	
4	2022/05/10	1030	KD/AE	1	CC	

Note: *; time when the test was loaded with fish

Sample Pre-Aeration

Aeration rate adjusted to 6.5 +/- 1 mL/min/L yes no

Preaeration time	0 hours	0.5 hours	1 hour	1.5 hours	2 hours
DO(mg/L) of 100%	<u>8.6</u>	<u>8.6</u>			
Temp (°C) of 100%	<u>16</u>				

DO in mg/L (70% - 100% saturation)**
 6.2 mg/L - 8.9 mg/L at 14°C
 6.1 mg/L - 8.8 mg/L at 15°C
 6.0 mg/L - 8.6 mg/L at 16°C
 **corrected for altitude

Test Chemistry and Biology

Conc.	CTL	6.3	12.5	25	50	100
pH (units) (range: 5.5-8.5)						
Day 0	<u>8.0</u>	<u>8.1</u>	<u>8.1</u>	<u>8.2</u>	<u>8.3</u>	<u>8.3</u>
Day 4	<u>8.1</u>	<u>8.1</u>	<u>8.1</u>	<u>8.1</u>	<u>8.1</u>	<u>8.1</u>
EC (µS/cm)						
Day 0	<u>438</u>	<u>481</u>	<u>518</u>	<u>612</u>	<u>778</u>	<u>1104</u>
Day 4	<u>440</u>	<u>490</u>	<u>517</u>	<u>614</u>	<u>781</u>	<u>1094</u>
DO (mg/L) (70-100% saturation at test temp.)						
Day 0	<u>8.8</u>	<u>8.8</u>	<u>8.8</u>	<u>8.6</u>	<u>8.6</u>	<u>8.6</u>
Day 4	<u>8.6</u>	<u>8.6</u>	<u>8.6</u>	<u>8.6</u>	<u>8.6</u>	<u>8.6</u>
Temperature (°C) (range: 14-16°C)						
Day 0	<u>15</u>	<u>15</u>	<u>15</u>	<u>16</u>	<u>16</u>	<u>16</u>
Day 4	<u>16</u>	<u>16</u>	<u>15</u>	<u>15</u>	<u>16</u>	<u>16</u>
Number Alive (In brackets number stressed)						
Day 0	10	10	10	10	10	10
Day 1	<u>10</u>	<u>10</u>	<u>10</u>	<u>10</u>	<u>10</u>	<u>10</u>
Day 2	<u>10</u>	<u>10</u>	<u>10</u>	<u>10</u>	<u>10</u>	<u>10(1)</u>
Day 3	<u>10</u>	<u>10</u>	<u>10</u>	<u>10</u>	<u>10</u>	<u>10(1)</u>
Day 4	<u>10</u>	<u>10</u>	<u>10</u>	<u>10</u>	<u>10</u>	<u>10(1)</u>

Validity Criteria: must be ≤ 10% mortality and/or stressed behavior in the control

Unless otherwise noted, behavior is considered to be normal

Control Organism Data			Test Organism Information	
Control Fish	Length (cm)	Weight (g)		
1	<u>3.5</u>	<u>0.5</u>	Loading Density (g/L): <u>0.2</u> (must be ≤ 0.5 g/L) Mean Length (cm): <u>3.1</u> Length Range (cm): <u>2.8-3.8</u> Mean Weight (g): <u>0.3</u> (Must be ≥ 0.3g) Weight Range (g): <u>0.2-0.6</u>	Batch <u>20220413TR</u>
2	<u>3.8</u>	<u>0.2</u>		Source <u>Smoky Trout Farm</u>
3	<u>3.0</u>	<u>0.3</u>		Tank # <u>10</u>
4	<u>3.2</u>	<u>0.3</u>		Days Held at 15± 2°C <u>23</u> (must be ≥ 14 days)
5	<u>3.1</u>	<u>0.3</u>		Percent stock mortality <u>0.33</u> (7 days prior to test, must be < 2%)
6	<u>2.9</u>	<u>0.2</u>		Test Volume (L) <u>18</u>
7	<u>2.9</u>	<u>0.2</u>		
8	<u>3.1</u>	<u>0.4</u>		
9	<u>3.0</u>	<u>0.3</u>		
10	<u>3.8</u>	<u>0.6</u>		
Comments :				

Reviewed By: ML

Date Reviewed: 2022/05/18

Method DAD

Client ALS106

Reference 2122 2120

Test Log

Sample Information

Day	Date	Time	Technician	Chem. Cart	Daily Data Review	Initial pH:	Initial EC (µS/cm):	Salinity (ppt):
0	2022/05/06	1600	AELKTM	2	DP	8.4	1153	
1	2022/05/07	0810	MPAF	2	SP			
2	2022/05/08	0905	W	2	SCC			

Lab Code	CTL	6	12	25	50	100

day

		pH (units) (range: 6.0-8.5)					
0		7.9	7.8	7.8	7.8	7.9	8.0
2		7.8	7.8	7.8	7.8	7.8	8.0

The pH of the sample was not adjusted prior to test setting, unless noted in the comments below

		EC (µS/cm)					
0		407	403	490	527	743	1070
2		416	473	515	590	742	1084

		DO (mg/L) (40-100% saturation at test temp.)					
0		7.9	7.7	7.7	7.7	7.7	7.7
2		7.9	7.9	7.9	7.9	7.9	7.9

		Temperature (°C) (range: 18-22 °C)					
0		20	21	21	21	21	21
2		20	20	20	20	20	20

		Number Alive (I, immobile)					
0		10	10	10	10	10	10
1		10	10	10	10	10	10
2		10	10	10	10	10	10

Validity Criteria: must be ≤ 10% mortality and/or abnormal behavior in the control
 Notes: Immobile; daphnid can't swim after 60 sec. even if antenna still move
 Unless otherwise noted, behaviour is considered to be normal

Culture
 Young jar Wed 04 Jar(s) mortality 7 days prior to test (must be ≤25%) 10%

QA (previous month)
 Days to first brood (≤12 days) 7
 Average number of young produced (≥15 young) 32
 Were test treatments randomized on test tray? Yes / No

Control Validity Criteria
 Mean % mortality at 48 hours - (must be ≤10%) 0

Sample
 DO (mg/L) of sample prior to aeration: 9.3 Temperature (°C) of sample prior to aeration: 21
 DO % of sample prior to aeration: 120% Is aeration required (<40% or >100%)? Yes or No
 Duration of aeration (37.5 +/- 12.5 mL/min/L): 20min Filtered with 110µm screen prior to testing Yes or No
 Hardness (mg CaCO₃/L) of 100%: 134 Is hardness adjustment required (<25 mg CaCO₃/L)? Yes or No
 Hardness of sample after adjustment (must be between 25 - 30 mg CaCO₃/L) —
 Alkalinity of 100% sample (mg CaCO₃/L): —

Dilution Water
 Pail label / preparation date 2:05/01
 Hardness of dilution water (mg/L) 150

DO Levels (40-100% saturation) - corrected for altitude -
 3.3 to 8.2 mg/L at 18°C 3.1 to 7.7 mg/L at 21°C
 3.2 to 8.1 mg/L at 19°C 3.0 to 7.6 mg/L at 22°C
 3.2 to 7.9 mg/L at 20°C

Comments/Observations:

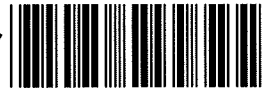
Reviewed By: M6 Date Reviewed: 2022/05/18

APPENDIX C – Chain-of-custody form



Chain of Custody
 Edmonton - Environmental
 9450 - 17 Avenue NW
 Edmonton AB Canada T6N 1M9

53087



Destination Lab: **Nautilus Environmental (Calgary)**
 Address: 10828 27 Street SE Calgary AB Canada T2Z 3V9
 Work Order Number: **EO2203075**
 Original Receipt Date/Time: 05/05/2022 15:47
 Instructions Received

Relinquished By
 Date/Time
 Received By
 Date/Time
 Receipt Temp

Return as Indicated: Results: ALSEDClientServices@alsglobal.com Invoice: ALSEDClientServices@alsglobal.com Electronic Data: ALSEDClientServices@alsglobal.com
 Attention: Pamela Toledo

ALS Sample ID	Client ID	Matrix	Container Type	Test Codes	Method Description	Due Date	Sampling Date and Time	Remarks
EO2203075-001	Pond C	Water	LDPE carboy	TRT-LC50-96	Survival/LC50 Rainbow Trout (96 hours)	12-05-2022	05/05/2022 13:15	
EO2203075-001	Pond C	Water	LDPE carboy			12-05-2022	05/05/2022 13:15	
EO2203075-001	Pond C	Water	LDPE carboy			12-05-2022	05/05/2022 13:15	
EO2203075-001	Pond C	Water	LDPE carboy			12-05-2022	05/05/2022 13:15	
EO2203075-001	Pond C	Water	HDPE	DAP-LC50-48	Survival/LC50 Daphnia Magna 48 hours	12-05-2022	05/05/2022 13:15	
EO2203075-001	Pond C	Water	HDPE			12-05-2022	05/05/2022 13:15	

2122-2120
 2022/05/05
 09:20
 Jor200
 JC/SRS
 4x10L pails,
 2x1L bottles
 No S/No L
 Good Cond

16.6°C

END OF REPORT



www.alsglobal.com

Chain of Custody (COC) / Analytical Request Form

Canada Toll Free: 1 800 668 9878

COC Number: 20 - 967015

Contact and company name below will appear on the final report

Reports / Recipients

Turnaround Time (TAT) Requested

AFFIX ALS BARCODE LABEL HERE (ALS use only)

- Routine [R] if received by 3pm M-F - no surcharges apply
- 4 day [P4] if received by 3pm M-F - 20% rush surcharge minimum
- 3 day [P3] if received by 3pm M-F - 25% rush surcharge minimum
- 2 day [P2] if received by 3pm M-F - 50% rush surcharge minimum
- 1 day [E] if received by 3pm M-F - 100% rush surcharge minimum
- Same day [E2] if received by 10am M-S - 200% rush surcharge. Additional fees may apply for rush requests on weekends, statutory holidays and non-routine tests

Date and Time Required for all EAP TATs:

For all tests with rush TATs requested, please contact your AM to confirm availability.

Analysis Request

Indicate Filtered (F), Preserved (P) or Filtered and Preserved (F/P) below

ALS Sample # (ALS use only)	Sample Identification and/or Coordinates (This description will appear on the report)	ALS Contact:	Date (dd-mm-yy)	Time (hhmm)	Sample Type	NUMBER OF CONTAINERS	SAMPLES ON HOLD	EXTENDED STORAGE REQUIRED	SUSPECTED HAZARD (see notes)
	Pond C	Pamela Toledo	05-May-22	13:15		<ul style="list-style-type: none"> Table 4.3 B Paphnia Mayra 48h Static Acute Toxicity test 			

Report To: **Clean Harbors Canada**

Contact: **Todd Webb, Stan Yuba**

Phone: **780 663-2513**

Company address below will appear on the final report

Street: **Po Box 390, 50114 Range Road 173**

City/Province: **Ryley, AB**

Postal Code: **T0E 4A0**

Invoice To: YES NO

Copy of Invoice with Report: YES NO

Company: **Clean Harbors Canada**

Contact: **Rohbi Gooding**

Project Information

ALS Account # / Quote #: **Q82442 (Table 4.3 B)**

Job #: **Pond C May 5**

PO / AFE: **Table 4.3 B**

LSD: **Table 4.3 B**

ALS Lab Work Order # (ALS use only):

Select Report Format: PDF EXCEL EDD (DIGITAL)

Merge QC/QC1 Reports with COA: YES NO N/A

Compare Results to Criteria on Report - provide details below if box checked

Select Distribution: EMAIL MAIL FAX

Email 1 or Fax: **webb.todd@cleanharbors.com**

Email 2: **yuba.stan@cleanharbors.com**

Email 3:

Select Invoice Distribution: EMAIL MAIL FAX

Invoice Recipients

Email 1 or Fax: **gooding.rohbi@cleanharbors.com**

Email 2:

Oil and Gas Required Fields (client use)

AP/ECost Center: **PO#**

Major/Minor Code: **Routing Code:**

Requisitioner:

Location:

Drinking Water (DW) Samples (client use)

Are samples taken from a Regulated DW System? YES NO

Are samples for human consumption/ use? YES NO

Notes / Specify Limits for result evaluation by selecting from drop-down below (Excel COC only)

Please Analyze as per Table 4.3B + Daphnia (attached) Quota Q82442

Cooling Method: NONE ICE

Submission Comments Identified on Sample

Cooler Custody Seals Intact: YES

INITIAL COOLER TEMPERATURES °C



Telephone : + 1 780 413 5227

SHIPMENT RELEASE (client use)

INITIAL SHIPMENT RECEPTION (ALS use only)

FINAL SHIPMENT RECEPTION (ALS use only)

Released by: **Todd Webb** Date: **May 5, 2022** Time: **14:00**

Received by: **[Signature]** Date: **May 5, 2022** Time: **16:27**

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 DW COC form.

Environmental Division
Edmonton
Work Order Reference
EO2203075

TABLE 4.3-B: RUNOFF LIMITS FOR SURFACE WATER DETENTION POND

PARAMETER	LIMITS Maximum unless otherwise indicated
pH	6.0 – 9.5 pH units
COD	50 mg/L
TDS	2500 mg/L
TSS	25 mg/L
Ammonia (expressed as Nitrogen)	5 mg/L
Chloride	250 mg/L
Sodium	200 mg/L
Sulphate	500 mg/L
Oil or other substances	Not present in amounts sufficient to create a visible film or sheen
96-Hour Multiple Concentration Acute Lethality Test Using Rainbow Trout (<i>Oncorhynchus mykiss</i>)	50% or greater survival

48 hr Static Acute Lethality test using *Daphnia Magna*

Appendix C
Pond B
Analytical Report
July 2022



CERTIFICATE OF ANALYSIS

Work Order	: EO2205135	Page	: 1 of 4
Client	: Clean Harbors Environmental Services, Inc.	Laboratory	: Edmonton - Environmental
Contact	: Todd Webb	Account Manager	: Pamela Toledo
Address	: PO Box 390, 50114 Rame Road 173 AB Canada T0B4A0	Address	: 9450 - 17 Avenue NW Edmonton AB Canada T6N 1M9
Telephone	: 780 663 2513	Telephone	: +1 780 413 5227
Project	: Pond B July 4	Date Samples Received	: 04-Jul-2022 17:45
PO	: ----	Date Analysis	: 05-Jul-2022
C-O-C number	: ----	Commenced	
Sampler	: TW	Issue Date	: 11-Jul-2022 16:15
Site	: Table 4.3B		
Quote number	: Q82439 / Q82442		
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.

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 FDA 21 CFR Part 11.

<i>Signatories</i>	<i>Position</i>	<i>Laboratory Department</i>
Amanda Powell	Account Manager	External Subcontracting, Edmonton, Alberta
Angeli Marzan	Lab Analyst	Inorganics, Edmonton, Alberta
Austin Wasylshyn	Lab Analyst	Metals, Edmonton, Alberta
Jessica Maitland	Lab Assistant	Inorganics, Edmonton, Alberta
Muzammil Ali	Lab Analyst	Inorganics, Edmonton, Alberta
Ping Yeung	Team Leader - Inorganics	Inorganics, Edmonton, Alberta
Sobhithan Pillay		Inorganics, Edmonton, Alberta
Yan Zhang	Lab Analyst	Organics, 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).

<i>Unit</i>	<i>Description</i>
-	No Unit
mg/L	milligrams per litre
pH units	pH units

>: greater than.

<: less 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.



Analytical Results

EO2205135-001

Sub-Matrix: Water

(Matrix: Water)

Client sample ID: Pond B

Client sampling date / time: 04-Jul-2022 12:00

Analyte	CAS Number	Result	LOR	Unit	Method	Prep Date	Analysis Date	QCLot
Physical Tests								
pH	----	8.19	0.10	pH units	E108	05-Jul-2022	06-Jul-2022	550116
solids, total dissolved [TDS]	----	732	20	mg/L	E162	-	05-Jul-2022	549719
solids, total suspended [TSS]	----	3.8	3.0	mg/L	E160	-	05-Jul-2022	549456
Anions and Nutrients								
ammonia, total (as N)	7664-41-7	0.0218	0.0050	mg/L	E298	05-Jul-2022	05-Jul-2022	550328
chloride	16887-00-6	37.3	0.50	mg/L	E235.Cl	05-Jul-2022	06-Jul-2022	550402
sulfate (as SO4)	14808-79-8	348	0.30	mg/L	E235.SO4	05-Jul-2022	06-Jul-2022	550401
Bioassays								
trout bioassay LC50	----	See attached	-	-	TRT-LC50-96	-	11-Jul-2022	-
Total Metals								
aluminum, total	7429-90-5	0.565	0.0030	mg/L	E420	05-Jul-2022	05-Jul-2022	549716
antimony, total	7440-36-0	0.00056	0.00010	mg/L	E420	05-Jul-2022	05-Jul-2022	549716
arsenic, total	7440-38-2	0.00259	0.00010	mg/L	E420	05-Jul-2022	05-Jul-2022	549716
barium, total	7440-39-3	0.0758	0.00010	mg/L	E420	05-Jul-2022	05-Jul-2022	549716
beryllium, total	7440-41-7	0.000034	0.000020	mg/L	E420	05-Jul-2022	05-Jul-2022	549716
bismuth, total	7440-69-9	<0.000050	0.000050	mg/L	E420	05-Jul-2022	05-Jul-2022	549716
boron, total	7440-42-8	0.088	0.010	mg/L	E420	05-Jul-2022	05-Jul-2022	549716
cadmium, total	7440-43-9	0.0000596	0.0000050	mg/L	E420	05-Jul-2022	05-Jul-2022	549716
calcium, total	7440-70-2	38.3	0.050	mg/L	E420	05-Jul-2022	05-Jul-2022	549716
cesium, total	7440-46-2	0.000082	0.000010	mg/L	E420	05-Jul-2022	05-Jul-2022	549716
chromium, total	7440-47-3	0.00126	0.00050	mg/L	E420	05-Jul-2022	05-Jul-2022	549716
cobalt, total	7440-48-4	0.00055	0.00010	mg/L	E420	05-Jul-2022	05-Jul-2022	549716
copper, total	7440-50-8	0.0126	0.00050	mg/L	E420	05-Jul-2022	05-Jul-2022	549716
iron, total	7439-89-6	0.762	0.010	mg/L	E420	05-Jul-2022	05-Jul-2022	549716
lead, total	7439-92-1	0.000742	0.000050	mg/L	E420	05-Jul-2022	05-Jul-2022	549716
lithium, total	7439-93-2	0.0398	0.0010	mg/L	E420	05-Jul-2022	05-Jul-2022	549716
magnesium, total	7439-95-4	14.9	0.0050	mg/L	E420	05-Jul-2022	05-Jul-2022	549716
manganese, total	7439-96-5	0.0201	0.00010	mg/L	E420	05-Jul-2022	05-Jul-2022	549716
molybdenum, total	7439-98-7	0.124	0.000050	mg/L	E420	05-Jul-2022	05-Jul-2022	549716
nickel, total	7440-02-0	0.0149	0.00050	mg/L	E420	05-Jul-2022	05-Jul-2022	549716
phosphorus, total	7723-14-0	0.053	0.050	mg/L	E420	05-Jul-2022	05-Jul-2022	549716
potassium, total	7440-09-7	8.30	0.050	mg/L	E420	05-Jul-2022	05-Jul-2022	549716
rubidium, total	7440-17-7	0.00372	0.00020	mg/L	E420	05-Jul-2022	05-Jul-2022	549716
selenium, total	7782-49-2	0.000988	0.000050	mg/L	E420	05-Jul-2022	05-Jul-2022	549716
silicon, total	7440-21-3	3.84	0.10	mg/L	E420	05-Jul-2022	05-Jul-2022	549716
silver, total	7440-22-4	0.000015	0.000010	mg/L	E420	05-Jul-2022	05-Jul-2022	549716
sodium, total	7440-23-5	188	0.050	mg/L	E420	05-Jul-2022	05-Jul-2022	549716
strontium, total	7440-24-6	0.426	0.00020	mg/L	E420	05-Jul-2022	05-Jul-2022	549716
sulfur, total	7704-34-9	124	0.50	mg/L	E420	05-Jul-2022	05-Jul-2022	549716
tellurium, total	13494-80-9	<0.00020	0.00020	mg/L	E420	05-Jul-2022	05-Jul-2022	549716
thallium, total	7440-28-0	0.000012	0.000010	mg/L	E420	05-Jul-2022	05-Jul-2022	549716
thorium, total	7440-29-1	0.00021	0.00010	mg/L	E420	05-Jul-2022	05-Jul-2022	549716
tin, total	7440-31-5	0.00014	0.00010	mg/L	E420	05-Jul-2022	05-Jul-2022	549716
titanium, total	7440-32-6	0.0122	0.00030	mg/L	E420	05-Jul-2022	05-Jul-2022	549716
tungsten, total	7440-33-7	0.00102	0.00010	mg/L	E420	05-Jul-2022	05-Jul-2022	549716
uranium, total	7440-61-1	0.00414	0.000010	mg/L	E420	05-Jul-2022	05-Jul-2022	549716
vanadium, total	7440-62-2	0.0265	0.00050	mg/L	E420	05-Jul-2022	05-Jul-2022	549716



Analytical Results

EO2205135-001

Sub-Matrix: **Water**

(Matrix: **Water**)

Client sample ID: Pond B

Client sampling date / time: 04-Jul-2022 12:00

Analyte	CAS Number	Result	LOR	Unit	Method	Prep Date	Analysis Date	QCLot
Total Metals								
zinc, total	7440-66-6	0.0135	0.0030	mg/L	E420	05-Jul-2022	05-Jul-2022	549716
zirconium, total	7440-67-7	0.00126	0.00020	mg/L	E420	05-Jul-2022	05-Jul-2022	549716
Aggregate Organics								
chemical oxygen demand [COD]	----	35	10	mg/L	E559-L	-	05-Jul-2022	549390
oil & grease (visible sheen)	----	Absent	-	-	E566	-	06-Jul-2022	-

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

QUALITY CONTROL INTERPRETIVE REPORT

Work Order	: EO2205135	Page	: 1 of 7
Client	: Clean Harbors Environmental Services, Inc.	Laboratory	: Edmonton - Environmental
Contact	: Todd Webb	Account Manager	: Pamela Toledo
Address	: PO Box 390, 50114 Rame Road 173 AB Canada T0B4A0	Address	: 9450 - 17 Avenue NW Edmonton, Alberta Canada T6N 1M9
Telephone	: 780 663 2513	Telephone	: +1 780 413 5227
Project	: Pond B July 4	Date Samples Received	: 04-Jul-2022 17:45
PO	: ----	Issue Date	: 11-Jul-2022 16:16
C-O-C number	: ----		
Sampler	: TW		
Site	: Table 4.3B		
Quote number	: Q82439 / Q82442		
No. of samples received	: 1		
No. of samples analysed	: 1		

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)

- Analysis Holding Time Outliers exist - please see following pages for full details.

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	
Aggregate Organics : Chemical Oxygen Demand by Colourimetry (Low Level)										
Amber glass total (sulfuric acid) Pond B	E559-L	04-Jul-2022	----	----	----		05-Jul-2022	28 days	1 days	✓
Aggregate Organics : Oil & Grease by Visible Sheen										
Amber glass (hydrochloric acid) Pond B	E566	04-Jul-2022	----	----	----		06-Jul-2022	28 days	2 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid) Pond B	E298	04-Jul-2022	05-Jul-2022	----	----		05-Jul-2022	28 days	1 days	✓
Anions and Nutrients : Chloride in Water by IC										
HDPE Pond B	E235.Cl	04-Jul-2022	----	----	----		06-Jul-2022	28 days	2 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE Pond B	E235.SO4	04-Jul-2022	----	----	----		06-Jul-2022	28 days	2 days	✓
Bioassays : Survival/LC50 Rainbow Trout (96 hours)										
LDPE carboy Pond B	TRT-LC50-96	04-Jul-2022	----	----	----		11-Jul-2022	5 days	7 days	* EHT
Physical Tests : pH by Meter										
HDPE Pond B	E108	04-Jul-2022	----	----	----		06-Jul-2022	0.25 hrs	44 hrs	* EHTR-FM



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	
Physical Tests : TDS by Gravimetry										
HDPE Pond B	E162	04-Jul-2022	----	----	----		05-Jul-2022	7 days	1 days	✓
Physical Tests : TSS by Gravimetry										
HDPE Pond B	E160	04-Jul-2022	----	----	----		05-Jul-2022	7 days	1 days	✓
Total Metals : Total Metals in Water by CRC ICPMS										
HDPE total (nitric acid) Pond B	E420	04-Jul-2022	----	----	----		05-Jul-2022	180 days	1 days	✓

Legend & Qualifier Definitions

EHTR-FM: Exceeded ALS recommended hold time prior to sample receipt. Field Measurement recommended
 EHT: Exceeded ALS recommended hold time prior to analysis.
 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	Method	QC Lot #	Count		Frequency (%)		Evaluation
			QC	Regular	Actual	Expected	
Analytical Methods							
Laboratory Duplicates (DUP)							
Ammonia by Fluorescence	E298	550328	1	9	11.1	5.0	✓
Chemical Oxygen Demand by Colourimetry (Low Level)	E559-L	549390	1	18	5.5	5.0	✓
Chloride in Water by IC	E235.Cl	550402	1	20	5.0	5.0	✓
pH by Meter	E108	550116	1	17	5.8	5.0	✓
Sulfate in Water by IC	E235.SO4	550401	1	16	6.2	5.0	✓
TDS by Gravimetry	E162	549719	1	13	7.6	5.0	✓
Total Metals in Water by CRC ICPMS	E420	549716	1	20	5.0	5.0	✓
TSS by Gravimetry	E160	549456	1	19	5.2	5.0	✓
Laboratory Control Samples (LCS)							
Ammonia by Fluorescence	E298	550328	1	9	11.1	5.0	✓
Chemical Oxygen Demand by Colourimetry (Low Level)	E559-L	549390	1	18	5.5	5.0	✓
Chloride in Water by IC	E235.Cl	550402	1	20	5.0	5.0	✓
pH by Meter	E108	550116	1	17	5.8	5.0	✓
Sulfate in Water by IC	E235.SO4	550401	1	16	6.2	5.0	✓
TDS by Gravimetry	E162	549719	1	13	7.6	5.0	✓
Total Metals in Water by CRC ICPMS	E420	549716	1	20	5.0	5.0	✓
TSS by Gravimetry	E160	549456	1	19	5.2	5.0	✓
Method Blanks (MB)							
Ammonia by Fluorescence	E298	550328	1	9	11.1	5.0	✓
Chemical Oxygen Demand by Colourimetry (Low Level)	E559-L	549390	1	18	5.5	5.0	✓
Chloride in Water by IC	E235.Cl	550402	1	20	5.0	5.0	✓
Sulfate in Water by IC	E235.SO4	550401	1	16	6.2	5.0	✓
TDS by Gravimetry	E162	549719	1	13	7.6	5.0	✓
Total Metals in Water by CRC ICPMS	E420	549716	1	20	5.0	5.0	✓
TSS by Gravimetry	E160	549456	1	19	5.2	5.0	✓
Matrix Spikes (MS)							
Ammonia by Fluorescence	E298	550328	1	9	11.1	5.0	✓
Chemical Oxygen Demand by Colourimetry (Low Level)	E559-L	549390	1	18	5.5	5.0	✓
Chloride in Water by IC	E235.Cl	550402	1	20	5.0	5.0	✓
Sulfate in Water by IC	E235.SO4	550401	1	16	6.2	5.0	✓
Total Metals in Water by CRC ICPMS	E420	549716	1	20	5.0	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
pH by Meter	E108 Edmonton - Environmental	Water	APHA 4500-H (mod)	pH is determined by potentiometric measurement with a pH electrode, and is conducted at ambient laboratory temperature (normally 20 ± 5°C). For high accuracy test results, pH should be measured in the field within the recommended 15 minute hold time.
TSS by Gravimetry	E160 Edmonton - Environmental	Water	APHA 2540 D (mod)	Total Suspended Solids (TSS) are determined by filtering a sample through a glass fibre filter, following by drying of the filter at 104 ± 1°C, with gravimetric measurement of the filtered solids. Samples containing very high dissolved solid content (i.e. seawaters, brackish waters) may produce a positive bias by this method. Alternate analysis methods are available for these types of samples.
TDS by Gravimetry	E162 Edmonton - Environmental	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 ± 2°C for 16 hours or to constant weight, with gravimetric measurement of the residue.
Chloride in Water by IC	E235.Cl Edmonton - Environmental	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Sulfate in Water by IC	E235.SO4 Edmonton - Environmental	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Ammonia by Fluorescence	E298 Edmonton - Environmental	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)
Total Metals in Water by CRC ICPMS	E420 Edmonton - Environmental	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.
Chemical Oxygen Demand by Colourimetry (Low Level)	E559-L Edmonton - Environmental	Water	APHA 5220 D (mod)	Samples are analyzed using the closed reflux colourimetric method.
Oil & Grease by Visible Sheen	E566 Edmonton - Environmental	Water	Alberta Energy Regulator, Drilling waste Management, Directive 050, July 2016	Use a qualitative visual observation of rainbow sheen to determine the presence or absence of oil and grease on water.



<i>Analytical Methods</i>	<i>Method / Lab</i>	<i>Matrix</i>	<i>Method Reference</i>	<i>Method Descriptions</i>
Survival/LC50 Rainbow Trout (96 hours)	TRT-LC50-96 Bureau Veritas (Edmonton) - 9331 - 48th Street Edmonton Alberta Canada T6B 2R4	Water	EPS1/RM/13	See attached report.
<i>Preparation Methods</i>	<i>Method / Lab</i>	<i>Matrix</i>	<i>Method Reference</i>	<i>Method Descriptions</i>
Preparation for Ammonia	EP298 Edmonton - Environmental	Water		Sample preparation for Preserved Nutrients Water Quality Analysis.



QUALITY CONTROL REPORT

Work Order	: EO2205135	Page	: 1 of 10
Client	: Clean Harbors Environmental Services, Inc.	Laboratory	: Edmonton - Environmental
Contact	: Todd Webb	Account Manager	: Pamela Toledo
Address	: PO Box 390, 50114 Rame Road 173 AB Canada T0B4A0	Address	: 9450 - 17 Avenue NW Edmonton, Alberta Canada T6N 1M9
Telephone	: 780 663 2513	Telephone	: +1 780 413 5227
Project	: Pond B July 4	Date Samples Received	: 04-Jul-2022 17:45
PO	: ----	Date Analysis Commenced	: 05-Jul-2022
C-O-C number	: ----	Issue Date	: 11-Jul-2022 16:16
Sampler	: TW		
Site	: Table 4.3B		
Quote number	: Q82439 / Q82442		
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.

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.

<i>Signatories</i>	<i>Position</i>	<i>Laboratory Department</i>
Amanda Powell	Account Manager	Bureau Veritas (Edmonton) External Subcontracting, Edmonton, Alberta
Angeli Marzan	Lab Analyst	Edmonton Inorganics, Edmonton, Alberta
Austin Wasylyshyn	Lab Analyst	Edmonton Metals, Edmonton, Alberta
Jessica Maitland	Lab Assistant	Edmonton Inorganics, Edmonton, Alberta
Muzammil Ali	Lab Analyst	Edmonton Inorganics, Edmonton, Alberta
Ping Yeung	Team Leader - Inorganics	Edmonton Inorganics, Edmonton, Alberta
Sobhithan Pillay		Edmonton Inorganics, Edmonton, Alberta
Yan Zhang	Lab Analyst	Edmonton Organics, Edmonton, Alberta

Page : 2 of 10
Work Order : EO2205135
Client : Clean Harbors Environmental Services, Inc.
Project : Pond B July 4



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

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



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: 549456)											
EO2205048-010	Anonymous	solids, total suspended [TSS]	----	E160	3.0	mg/L	31.4	27.6	3.8	Diff <2x LOR	----
Physical Tests (QC Lot: 549719)											
EO2205092-001	Anonymous	solids, total dissolved [TDS]	----	E162	20	mg/L	154	148	6	Diff <2x LOR	----
Physical Tests (QC Lot: 550116)											
EO2205134-002	Anonymous	pH	----	E108	0.10	pH units	8.18	8.13	0.613%	3%	----
Anions and Nutrients (QC Lot: 550328)											
EO2205135-001	Pond B	ammonia, total (as N)	7664-41-7	E298	0.0050	mg/L	0.0218	0.0213	0.0005	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 550401)											
FC2201472-001	Anonymous	sulfate (as SO4)	14808-79-8	E235.SO4	0.30	mg/L	74.4	74.2	0.318%	20%	----
Anions and Nutrients (QC Lot: 550402)											
FC2201472-001	Anonymous	chloride	16887-00-6	E235.Cl	0.50	mg/L	52.9	52.4	1.08%	20%	----
Total Metals (QC Lot: 549716)											
EO2204958-001	Anonymous	aluminum, total	7429-90-5	E420	0.0600	mg/L	26.8	25.2	5.78%	20%	----
		antimony, total	7440-36-0	E420	0.00200	mg/L	<0.00200	<0.00200	0	Diff <2x LOR	----
		arsenic, total	7440-38-2	E420	0.00200	mg/L	0.0161	0.0156	0.00051	Diff <2x LOR	----
		barium, total	7440-39-3	E420	0.00200	mg/L	0.680	0.640	5.98%	20%	----
		beryllium, total	7440-41-7	E420	0.000400	mg/L	0.00280	0.00287	0.000067	Diff <2x LOR	----
		bismuth, total	7440-69-9	E420	0.00100	mg/L	<0.00100	<0.00100	0	Diff <2x LOR	----
		boron, total	7440-42-8	E420	0.200	mg/L	0.500	0.503	0.003	Diff <2x LOR	----
		cadmium, total	7440-43-9	E420	0.000100	mg/L	0.000713	0.000679	0.0000342	Diff <2x LOR	----
		calcium, total	7440-70-2	E420	1.00	mg/L	45.1	44.2	2.08%	20%	----
		cesium, total	7440-46-2	E420	0.000200	mg/L	0.00267	0.00249	6.86%	20%	----
		chromium, total	7440-47-3	E420	0.0100	mg/L	0.0296	0.0284	0.00118	Diff <2x LOR	----
		cobalt, total	7440-48-4	E420	0.00200	mg/L	0.0179	0.0171	0.00081	Diff <2x LOR	----
		copper, total	7440-50-8	E420	0.0100	mg/L	0.0678	0.0649	0.00296	Diff <2x LOR	----
		iron, total	7439-89-6	E420	0.200	mg/L	20.2	18.8	7.10%	20%	----
		lead, total	7439-92-1	E420	0.00100	mg/L	0.0188	0.0180	4.39%	20%	----
		lithium, total	7439-93-2	E420	0.0200	mg/L	0.0955	0.0895	0.0060	Diff <2x LOR	----
		magnesium, total	7439-95-4	E420	0.100	mg/L	13.7	12.9	5.80%	20%	----
		manganese, total	7439-96-5	E420	0.00200	mg/L	0.422	0.412	2.45%	20%	----
		molybdenum, total	7439-98-7	E420	0.00100	mg/L	0.00117	0.00117	0.000003	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: 549716) - continued											
EO2204958-001	Anonymous	nickel, total	7440-02-0	E420	0.0100	mg/L	0.0769	0.0731	0.00384	Diff <2x LOR	----
		phosphorus, total	7723-14-0	E420	1.00	mg/L	<1.00	<1.00	0	Diff <2x LOR	----
		potassium, total	7440-09-7	E420	1.00	mg/L	10.4	10.1	3.83%	20%	----
		rubidium, total	7440-17-7	E420	0.00400	mg/L	0.0310	0.0293	0.00172	Diff <2x LOR	----
		selenium, total	7782-49-2	E420	0.00100	mg/L	<0.00100	0.00100	0.000004	Diff <2x LOR	----
		silicon, total	7440-21-3	E420	2.00	mg/L	66.3	64.4	3.01%	20%	----
		silver, total	7440-22-4	E420	0.000200	mg/L	0.000301	0.000261	0.000039	Diff <2x LOR	----
		sodium, total	7440-23-5	E420	1.00	mg/L	202	202	0.215%	20%	----
		strontium, total	7440-24-6	E420	0.00400	mg/L	0.751	0.738	1.83%	20%	----
		sulfur, total	7704-34-9	E420	10.0	mg/L	62.1	63.8	1.72	Diff <2x LOR	----
		tellurium, total	13494-80-9	E420	0.00400	mg/L	<0.00400	<0.00400	0	Diff <2x LOR	----
		thallium, total	7440-28-0	E420	0.000200	mg/L	0.000384	0.000304	0.000080	Diff <2x LOR	----
		thorium, total	7440-29-1	E420	0.00200	mg/L	0.00300	0.00328	0.00028	Diff <2x LOR	----
		tin, total	7440-31-5	E420	0.00200	mg/L	<0.00200	<0.00200	0	Diff <2x LOR	----
		titanium, total	7440-32-6	E420	0.00600	mg/L	0.178	0.147	19.2%	20%	----
		tungsten, total	7440-33-7	E420	0.00200	mg/L	<0.00200	<0.00200	0	Diff <2x LOR	----
		uranium, total	7440-61-1	E420	0.000200	mg/L	0.00394	0.00374	5.14%	20%	----
		vanadium, total	7440-62-2	E420	0.0100	mg/L	0.0549	0.0508	0.00405	Diff <2x LOR	----
		zinc, total	7440-66-6	E420	0.0600	mg/L	0.182	0.172	0.0104	Diff <2x LOR	----
		zirconium, total	7440-67-7	E420	0.00400	mg/L	0.0273	0.0275	0.00024	Diff <2x LOR	----
Aggregate Organics (QC Lot: 549390)											
EO2205003-004	Anonymous	chemical oxygen demand [COD]	----	E559-L	100	mg/L	8300	8650	4.24%	20%	----



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: 549456)						
solids, total suspended [TSS]	----	E160	3	mg/L	<3.0	----
Physical Tests (QCLot: 549719)						
solids, total dissolved [TDS]	----	E162	10	mg/L	<10	----
Anions and Nutrients (QCLot: 550328)						
ammonia, total (as N)	7664-41-7	E298	0.005	mg/L	<0.0050	----
Anions and Nutrients (QCLot: 550401)						
sulfate (as SO4)	14808-79-8	E235.SO4	0.3	mg/L	<0.30	----
Anions and Nutrients (QCLot: 550402)						
chloride	16887-00-6	E235.Cl	0.5	mg/L	<0.50	----
Total Metals (QCLot: 549716)						
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	----
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	----



Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Total Metals (QCLot: 549716) - continued						
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	----
Aggregate Organics (QCLot: 549390)						
chemical oxygen demand [COD]	----	E559-L	10	mg/L	<10	----



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 Concentration	Recovery (%)	Recovery Limits (%)		Qualifier
Analyte	CAS Number	Method	LOR	Unit	Concentration	LCS	Low	High	Qualifier
Physical Tests (QCLot: 549456)									
solids, total suspended [TSS]	---	E160	3	mg/L	150 mg/L	93.3	85.0	115	---
Physical Tests (QCLot: 549719)									
solids, total dissolved [TDS]	---	E162	10	mg/L	1000 mg/L	94.0	85.0	115	---
Physical Tests (QCLot: 550116)									
pH	---	E108	---	pH units	6 pH units	102	97.0	103	---
Anions and Nutrients (QCLot: 550328)									
ammonia, total (as N)	7664-41-7	E298	0.005	mg/L	0.2 mg/L	102	85.0	115	---
Anions and Nutrients (QCLot: 550401)									
sulfate (as SO4)	14808-79-8	E235.SO4	0.3	mg/L	100 mg/L	108	90.0	110	---
Anions and Nutrients (QCLot: 550402)									
chloride	16887-00-6	E235.Cl	0.5	mg/L	100 mg/L	102	90.0	110	---
Total Metals (QCLot: 549716)									
aluminum, total	7429-90-5	E420	0.003	mg/L	2 mg/L	110	80.0	120	---
antimony, total	7440-36-0	E420	0.0001	mg/L	1 mg/L	111	80.0	120	---
arsenic, total	7440-38-2	E420	0.0001	mg/L	1 mg/L	106	80.0	120	---
barium, total	7440-39-3	E420	0.0001	mg/L	0.25 mg/L	105	80.0	120	---
beryllium, total	7440-41-7	E420	0.00002	mg/L	0.1 mg/L	99.4	80.0	120	---
bismuth, total	7440-69-9	E420	0.00005	mg/L	1 mg/L	104	80.0	120	---
boron, total	7440-42-8	E420	0.01	mg/L	1 mg/L	89.8	80.0	120	---
cadmium, total	7440-43-9	E420	0.000005	mg/L	0.1 mg/L	107	80.0	120	---
calcium, total	7440-70-2	E420	0.05	mg/L	50 mg/L	99.2	80.0	120	---
cesium, total	7440-46-2	E420	0.00001	mg/L	0.05 mg/L	108	80.0	120	---
chromium, total	7440-47-3	E420	0.0005	mg/L	0.25 mg/L	109	80.0	120	---
cobalt, total	7440-48-4	E420	0.0001	mg/L	0.25 mg/L	108	80.0	120	---
copper, total	7440-50-8	E420	0.0005	mg/L	0.25 mg/L	109	80.0	120	---
iron, total	7439-89-6	E420	0.01	mg/L	1 mg/L	106	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	106	80.0	120	---
manganese, total	7439-96-5	E420	0.0001	mg/L	0.25 mg/L	109	80.0	120	---
molybdenum, total	7439-98-7	E420	0.00005	mg/L	0.25 mg/L	99.7	80.0	120	---
nickel, total	7440-02-0	E420	0.0005	mg/L	0.5 mg/L	108	80.0	120	---



Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		Qualifier
					Concentration	LCS	Low	High	
Total Metals (QCLot: 549716) - continued									
phosphorus, total	7723-14-0	E420	0.05	mg/L	10 mg/L	104	80.0	120	----
potassium, total	7440-09-7	E420	0.05	mg/L	50 mg/L	106	80.0	120	----
rubidium, total	7440-17-7	E420	0.0002	mg/L	0.1 mg/L	109	80.0	120	----
selenium, total	7782-49-2	E420	0.00005	mg/L	1 mg/L	102	80.0	120	----
silicon, total	7440-21-3	E420	0.1	mg/L	10 mg/L	97.7	80.0	120	----
silver, total	7440-22-4	E420	0.00001	mg/L	0.1 mg/L	99.0	80.0	120	----
sodium, total	7440-23-5	E420	0.05	mg/L	50 mg/L	99.1	80.0	120	----
strontium, total	7440-24-6	E420	0.0002	mg/L	0.25 mg/L	99.6	80.0	120	----
sulfur, total	7704-34-9	E420	0.5	mg/L	50 mg/L	92.3	80.0	120	----
tellurium, total	13494-80-9	E420	0.0002	mg/L	0.1 mg/L	103	80.0	120	----
thallium, total	7440-28-0	E420	0.00001	mg/L	1 mg/L	103	80.0	120	----
thorium, total	7440-29-1	E420	0.0001	mg/L	0.1 mg/L	92.5	80.0	120	----
tin, total	7440-31-5	E420	0.0001	mg/L	0.5 mg/L	105	80.0	120	----
titanium, total	7440-32-6	E420	0.0003	mg/L	0.25 mg/L	103	80.0	120	----
tungsten, total	7440-33-7	E420	0.0001	mg/L	0.1 mg/L	102	80.0	120	----
uranium, total	7440-61-1	E420	0.00001	mg/L	0.005 mg/L	103	80.0	120	----
vanadium, total	7440-62-2	E420	0.0005	mg/L	0.5 mg/L	107	80.0	120	----
zinc, total	7440-66-6	E420	0.003	mg/L	0.5 mg/L	106	80.0	120	----
zirconium, total	7440-67-7	E420	0.0002	mg/L	0.1 mg/L	97.1	80.0	120	----
Aggregate Organics (QCLot: 549390)									
chemical oxygen demand [COD]	----	E559-L	10	mg/L	100 mg/L	91.6	85.0	115	----



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 $\geq 1x$ spike level.

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
Anions and Nutrients (QCLot: 550328)										
EO2205149-001	Anonymous	ammonia, total (as N)	7664-41-7	E298	0.0959 mg/L	0.1 mg/L	95.9	75.0	125	----
Anions and Nutrients (QCLot: 550401)										
FC2201472-001	Anonymous	sulfate (as SO4)	14808-79-8	E235.SO4	112 mg/L	100 mg/L	112	75.0	125	----
Anions and Nutrients (QCLot: 550402)										
FC2201472-001	Anonymous	chloride	16887-00-6	E235.Cl	104 mg/L	100 mg/L	104	75.0	125	----
Total Metals (QCLot: 549716)										
EO2204958-002	Anonymous	aluminum, total	7429-90-5	E420	ND mg/L	0.2 mg/L	ND	70.0	130	----
		antimony, total	7440-36-0	E420	0.0229 mg/L	0.02 mg/L	114	70.0	130	----
		arsenic, total	7440-38-2	E420	0.0223 mg/L	0.02 mg/L	112	70.0	130	----
		barium, total	7440-39-3	E420	ND mg/L	0.02 mg/L	ND	70.0	130	----
		beryllium, total	7440-41-7	E420	0.0441 mg/L	0.04 mg/L	110	70.0	130	----
		bismuth, total	7440-69-9	E420	0.00988 mg/L	0.01 mg/L	98.8	70.0	130	----
		boron, total	7440-42-8	E420	ND mg/L	0.1 mg/L	ND	70.0	130	----
		cadmium, total	7440-43-9	E420	0.00444 mg/L	0.004 mg/L	111	70.0	130	----
		calcium, total	7440-70-2	E420	ND mg/L	4 mg/L	ND	70.0	130	----
		cesium, total	7440-46-2	E420	0.0113 mg/L	0.01 mg/L	113	70.0	130	----
		chromium, total	7440-47-3	E420	0.0454 mg/L	0.04 mg/L	114	70.0	130	----
		cobalt, total	7440-48-4	E420	0.0222 mg/L	0.02 mg/L	111	70.0	130	----
		copper, total	7440-50-8	E420	ND mg/L	0.02 mg/L	ND	70.0	130	----
		iron, total	7439-89-6	E420	ND mg/L	2 mg/L	ND	70.0	130	----
		lead, total	7439-92-1	E420	0.0200 mg/L	0.02 mg/L	99.8	70.0	130	----
		lithium, total	7439-93-2	E420	0.105 mg/L	0.1 mg/L	105	70.0	130	----
		magnesium, total	7439-95-4	E420	ND mg/L	1 mg/L	ND	70.0	130	----
		manganese, total	7439-96-5	E420	ND mg/L	0.02 mg/L	ND	70.0	130	----
		molybdenum, total	7439-98-7	E420	0.0207 mg/L	0.02 mg/L	104	70.0	130	----
		nickel, total	7440-02-0	E420	0.0446 mg/L	0.04 mg/L	112	70.0	130	----
		phosphorus, total	7723-14-0	E420	10.7 mg/L	10 mg/L	107	70.0	130	----
		potassium, total	7440-09-7	E420	ND mg/L	4 mg/L	ND	70.0	130	----
		rubidium, total	7440-17-7	E420	0.0224 mg/L	0.02 mg/L	112	70.0	130	----
		selenium, total	7782-49-2	E420	0.0409 mg/L	0.04 mg/L	102	70.0	130	----
		silicon, total	7440-21-3	E420	ND mg/L	10 mg/L	ND	70.0	130	----
		silver, total	7440-22-4	E420	0.00424 mg/L	0.004 mg/L	106	70.0	130	----



Sub-Matrix: **Water**

					<i>Matrix Spike (MS) Report</i>					
					<i>Spike</i>		<i>Recovery (%)</i>	<i>Recovery Limits (%)</i>		
<i>Laboratory sample ID</i>	<i>Client sample ID</i>	<i>Analyte</i>	<i>CAS Number</i>	<i>Method</i>	<i>Concentration</i>	<i>Target</i>	<i>MS</i>	<i>Low</i>	<i>High</i>	<i>Qualifier</i>
Total Metals (QCLot: 549716) - continued										
EO2204958-002	Anonymous	sodium, total	7440-23-5	E420	ND mg/L	2 mg/L	ND	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	ND mg/L	20 mg/L	ND	70.0	130	----
		tellurium, total	13494-80-9	E420	0.0431 mg/L	0.04 mg/L	108	70.0	130	----
		thallium, total	7440-28-0	E420	0.00384 mg/L	0.004 mg/L	96.0	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	0.0225 mg/L	0.02 mg/L	112	70.0	130	----
		titanium, total	7440-32-6	E420	ND mg/L	0.04 mg/L	ND	70.0	130	----
		tungsten, total	7440-33-7	E420	0.0206 mg/L	0.02 mg/L	103	70.0	130	----
		uranium, total	7440-61-1	E420	0.00415 mg/L	0.004 mg/L	104	70.0	130	----
		vanadium, total	7440-62-2	E420	0.113 mg/L	0.1 mg/L	113	70.0	130	----
		zinc, total	7440-66-6	E420	0.418 mg/L	0.4 mg/L	104	70.0	130	----
		zirconium, total	7440-67-7	E420	0.0396 mg/L	0.04 mg/L	99.0	70.0	130	----
Aggregate Organics (QCLot: 549390)										
EO2205003-005	Anonymous	chemical oxygen demand [COD]	----	E559-L	ND mg/L	100 mg/L	ND	75.0	125	----



RESULTS OF DAPHNIA MAGNA LC50 MULTI-CONCENTRATION

BUREAU VERITAS

Client : 70036 ALS ENVIRONMENTAL, CALGARY
Client Project Name & Number: EO2205135

Job Number: C247502
Sample Number: AWM114-02

Test Result:

48 hrs LC50 % vol/vol (95% CL): >100% (N/A) Statistical Method: Visual

Sample Name : POND B
Description: Yellow, clear
Sample Collected: Jul 04, 2022 12:00 PM
Sample Collected By: N/A
Sample Received: Jul 05, 2022 09:50 AM
Analysis Start : Jul 05, 2022 11:02 AM
End : Jul 07, 2022 10:10 AM
Sample Matrix : Water
Sample Prior to Analysis:
pH: 8.2
Temperature : 19 °C
Dissolved Oxygen: 7.9 mg/L
Sample Conductance: 926 µS/cm
Hardness: 160 mg CaCO3/L

Table with 13 columns: Concentration, Temperature (°C), pH (pH), Conductivity (uS/cm), Dissolved Oxygen (mg/L), Mortality (#), Mortality (%), Immobility (#), Immobility (%), Temperature (°C), pH (pH), Conductivity (uS/cm), Dissolved Oxygen (mg/L). Rows include % vol/vol (Start) and concentrations 0, 6.25, 12.5, 25, 50, 100.

Table with 5 columns: Concentration, Mortality (#), Mortality (%), Immobility (#), Immobility (%). Rows include % vol/vol (48 hrs) and concentrations 0, 6.25, 12.5, 25, 50, 100.

Comments : None

Culture/Control/Dilution Water: City of Edmonton dechlorinated tap water
Hardness: 180 mg/L CaCO3 Other parameters available on request.

Test Conditions
Test concentration : 0,6.25,12.5,25,50,100 (% vol/vol)
Organisms per Vessel : 10 Pre-aeration Time : 0 min Rate of Pre-aeration : 25-50 mL/min/L
Total # of Organisms Used : 60 Test Temperature : 20 ± 2 °C Test Hardness Adjusted : No
Test Volume : 150 mL Vessel Volume : 225 mL Test pH Adjusted: No
Loading Density : 15.0 mL/Daphnia Photoperiod : 16:8 (light: dark)

Test Organism : Daphnia magna Source : In House Culture
Age at Test Initiation : <24 hrs Average Brood Size : 28.5
Culture Photoperiod : 16:8 (light: dark) % Mortality within 7 days : 1.6
Culture Temperature : 20 ± 2 °C Time To First Brood : 7 Days
Culture Diet Pseudokirchneriella and YTC at a ratio of 2 mL/L of culture daily. New cultures weekly, 63 daphnids distributed into 6 culture vessels and 3 reproductive vessels.



RESULTS OF DAPHNIA MAGNA LC50 MULTI-CONCENTRATION

BUREAU VERITAS

Client : 70036 ALS ENVIRONMENTAL, CALGARY
Client Project Name & Number: EO2205135

Job Number: C247502
Sample Number: AWM114-02

Reference chemical: Sodium Chloride
Test Date: Jul 01, 2022
Test Endpoint 48 hrs LC50 (95% confidence interval) : 6.17 (5.50, 6.93)g/L
Statistical Method : Untrimmed Spearman-Kärber
Historical Mean LC50 (warning limits) : 6.19 (4.60, 8.31) g/L
Concentration : 0,1.71,2.56,3.82,5.7,8.5 g/L

Test Method EPS 1/RM/14
Method Deviations: None

Note: The results contained in this report refer only to the testing of the sample submitted. Bureau Veritas is accredited to ISO/IEC 17025 for specific parameters on scopes of accreditation, including the toxicity parameters reported herein. The conductivity, dissolved oxygen and pH data contained within the toxicity report are provided for information purposes and are not individually accredited parameters. This report may not be reproduced, except in its entirety, without the written approval of the laboratory.

Analyst : Chelsea Tessier, Natasha Lloyd

[Handwritten signature]

Verified By : Cara Shurgot, Analyst 2

Date: Jul 08, 2022 02:16 PM



RESULTS OF RAINBOW TROUT LC50 MULTI-CONCENTRATION

BUREAU
VERITAS

Client : 70036 ALS ENVIRONMENTAL, CALGARY
Client Project Name & Number: EO2205135

Job Number: C247502

Test Result:

96 hrs LC50 % vol/vol (95% CL): >100% (N/A) Statistical Method: Visual

Sample Name :	POND B	Sample Matrix :	Water
Description:	Yellow, clear	Sample Number:	AWM114-01
Sample Collected:	Jul 04, 2022 12:00 PM	Sampling Method :	N/A
Sample Collected By:	N/A	Volume Received:	40 L
Sample Received:	Jul 05, 2022 09:50 AM	pH:	7.9
Analysis Start :	Jul 05, 2022 11:50 AM	Temperature :	14 °C
		Avg Temp Arrival:	7 °C
		Storage:	2-6°C
		Dissolved Oxygen:	8.4 mg/L
		Sample Conductance:	827 µS/cm

Concentration	Temperature (°C)	pH (pH)	Conductivity (uS/cm)	Dissolved Oxygen (mg/L)	Mortality (#)	Mortality (%)	Atypical Behaviour (#)	Atypical Behaviour (%)	Mortality (#)	Mortality (%)	Atypical Behaviour (#)	Atypical Behaviour (%)
% vol/vol	Start	Start	Start	Start	24 hrs	24 hrs	24 hrs	24 hrs	48 hrs	48 hrs	48 hrs	48 hrs
0	15	8.0	355	9.1	0	0	0	0	0	0	0	0
6.25	15	8.0	386	9.1	0	0	0	0	0	0	0	0
12.5	14	7.8	429	9.2	0	0	0	0	0	0	0	0
25	14	8.0	484	9.1	0	0	0	0	0	0	0	0
50	14	7.9	608	9.0	0	0	0	0	0	0	0	0
100	14	7.9	838	9.2	0	0	0	0	0	0	0	0

Concentration	Mortality (#)	Mortality (%)	Atypical Behaviour (#)	Atypical Behaviour (%)	Temperature (°C)	pH (pH)	Conductivity (uS/cm)	Dissolved Oxygen (mg/L)	Mortality (#)	Mortality (%)	Atypical Behaviour (#)	Atypical Behaviour (%)
% vol/vol	72 hrs	72 hrs	72 hrs	72 hrs	96 hrs	96 hr	96 hrs	96 hrs	96 hrs	96 hrs	96 hrs	96 hrs
0	0	0	0	0	15	7.9	354	8.8	0	0	0	0
6.25	0	0	0	0	15	8.0	382	8.8	0	0	0	0
12.5	0	0	0	0	15	8.0	430	8.7	0	0	0	0
25	0	0	0	0	15	8.0	488	8.7	0	0	0	0
50	0	0	0	0	15	7.8	615	7.6	0	0	0	0
100	0	0	0	0	15	8.1	846	8.6	0	0	0	0

Comments : None

Culture/Control/Dilution Water

City of Edmonton dechlorinated tap water

Hardness:

190 mg/L CaCO₃

Other parameters available on request.

Test Conditions

Test concentration : 0,6.25,12.5,25,50,100 (% vol/vol)

Organisms per Vessel :	10	Test Temperature :	15 ± 1 °C	Solution Depth :	>15 cm
Total # of Organisms Used :	60	Pre-aeration Time :	30 min.	Rate of Aeration :	6.5±1 mL/min/L
Test Volume :	20 L	Vessel Volume :	38L	Test pH Adjusted:	No
Loading Density :	0.3 g/L	Photoperiod :	16:8 (light: dark)		

Test Organism :

Rainbow Trout (*Oncorhynchus mykiss*) Source : Spring Valley Trout Hatchery

Culture Temperature :	15 ± 2 °C	Weight (Mean) +- SD :	0.6 ± 0.1 g	Length (Mean) +- SD :	4.24 ± 0.31 cm
Culture Water Renewal :	≥ 1.0 L/min/kg fish	Weight (Range) :	0.4 – 0.8 g	Length (Range) :	3.70 – 4.80 cm
Culture Photoperiod :	16:8 (light: dark)			% Mortality within 7 days :	0%
Feeding rate and frequency :	daily: 1-5% biomass of trout.			Acclimation Time:	>14 days

Reference chemical:

Phenol

Test Date:

Jun 28, 2022

Test Endpoint 96 hrs LC50 (95% confidence interval) :

10.4 (9.35, 11.4)mg/L

Statistical Method :

Probit

Historical Mean LC50 (warning limits) :

9.94 (8.72, 11.3) mg/L

Concentration : 0,8,10,12,15,20 mg/L



RESULTS OF RAINBOW TROUT LC50 MULTI-CONCENTRATION

BUREAU
VERITAS

Client : 70036 ALS ENVIRONMENTAL, CALGARY
Client Project Name & Number: EO2205135

Job Number: C247502
Sample Number: AWM114-01

Test Method EPS 1/RM/13
Method Deviations : None

Note: The results contained in this report refer only to the testing of the sample submitted. Bureau Veritas is accredited to ISO/IEC 17025 for specific parameters on scopes of accreditation, including the toxicity parameters reported herein. The conductivity, dissolved oxygen and pH data contained within the toxicity report are provided for information purposes and are not individually accredited parameters. This report may not be reproduced, except in its entirety, without the written approval of the laboratory.

Analyst : Cara Shurgot, Kaylie Lyons, Kyle Monaghan

Verified By : Cara Shurgot, Analyst 2

Date: Jul 09, 2022 01:48 PM

Bureau Veritas Job Number: C247502
Report Date: 2022/07/09

ALS ENVIRONMENTAL
Client Project #: EO2205135

RESULTS OF CHEMICAL ANALYSES OF WATER

Bureau Veritas ID		AWM114	
Sampling Date		2022/07/04 12:00	
COC Number		62453	
	UNITS	POND B	QC Batch
Daphnia Magna Bioassay			
LC50	% vol/vol	ATTACHED	A633088

RDL = Reportable Detection Limit

N/A = Not Applicable

Results relate only to the items tested.



Your Project #: EO2205135
Your C.O.C. #: 62453

Attention: ALS Reporting Edmonton

ALS ENVIRONMENTAL
Bay 7, 1313 44th ave NE
CALGARY, AB
CANADA T2E 6L5

Report Date: 2022/07/09
Report #: R3197701
Version: 1 - Final

CERTIFICATE OF ANALYSIS

BUREAU VERITAS JOB #: C247502

Received: 2022/07/05, 09:50

Sample Matrix: Water
Samples Received: 1

Analyses	Quantity	Date	Date	Laboratory Method	Analytical Method
		Extracted	Analyzed		
Daphnia magna LC50 Multi-Concentration	1	N/A	2022/07/05	EENVSOP-00154	EPS 1 RM14 2nd ed m
Rainbow Trout LC50 Multi-Concentration	1	N/A	2022/07/05	EENVSOP-00160	EPS 1 RM13 2nd ed m

Remarks:

Bureau Veritas is accredited to ISO/IEC 17025 for specific parameters on scopes of accreditation. Unless otherwise noted, procedures used by Bureau Veritas are based upon recognized Provincial, Federal or US method compendia such as CCME, MELCC, EPA, APHA.

All work recorded herein has been done in accordance with procedures and practices ordinarily exercised by professionals in Bureau Veritas' profession using accepted testing methodologies, quality assurance and quality control procedures (except where otherwise agreed by the client and Bureau Veritas in writing). All data is in statistical control and has met quality control and method performance criteria unless otherwise noted. All method blanks are reported; unless indicated otherwise, associated sample data are not blank corrected. Where applicable, unless otherwise noted, Measurement Uncertainty has not been accounted for when stating conformity to the referenced standard.

Bureau Veritas liability is limited to the actual cost of the requested analyses, unless otherwise agreed in writing. There is no other warranty expressed or implied. Bureau Veritas has been retained to provide analysis of samples provided by the Client using the testing methodology referenced in this report. Interpretation and use of test results are the sole responsibility of the Client and are not within the scope of services provided by Bureau Veritas, unless otherwise agreed in writing. Bureau Veritas is not responsible for the accuracy or any data impacts, that result from the information provided by the customer or their agent.

Solid sample results, except biota, are based on dry weight unless otherwise indicated. Organic analyses are not recovery corrected except for isotope dilution methods.

Results relate to samples tested. When sampling is not conducted by Bureau Veritas, results relate to the supplied samples tested. This Certificate shall not be reproduced except in full, without the written approval of the laboratory.

Reference Method suffix "m" indicates test methods incorporate validated modifications from specific reference methods to improve performance.

* RPDs calculated using raw data. The rounding of final results may result in the apparent difference.



Your Project #: EO2205135
Your C.O.C. #: 62453

Attention: ALS Reporting Edmonton

ALS ENVIRONMENTAL
Bay 7, 1313 44th ave NE
CALGARY, AB
CANADA T2E 6L5

Report Date: 2022/07/09
Report #: R3197701
Version: 1 - Final

CERTIFICATE OF ANALYSIS

BUREAU VERITAS JOB #: C247502

Received: 2022/07/05, 09:50

Encryption Key

Please direct all questions regarding this Certificate of Analysis to your Project Manager.
Customer Solutions, Western Canada Customer Experience Team
Email: customersolutionswest@bureauveritas.com
Phone# (780) 577-7100

=====
This report has been generated and distributed using a secure automated process.
Bureau Veritas has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per ISO/IEC 17025, signing the reports.
For Service Group specific validation please refer to the Validation Signature Page.



**BUREAU
VERITAS**

Bureau Veritas Job #: C247502
Report Date: 2022/07/09

ALS ENVIRONMENTAL
Client Project #: EO2205135

RESULTS OF CHEMICAL ANALYSES OF WATER

Bureau Veritas ID		AWM114	
Sampling Date		2022/07/04 12:00	
COC Number		62453	
	UNITS	POND B	QC Batch
Daphnia Magna Bioassay			
LC50	% vol/vol	ATTACHED	A633088



**BUREAU
VERITAS**

Bureau Veritas Job #: C247502
Report Date: 2022/07/09

ALS ENVIRONMENTAL
Client Project #: EO2205135

TOXICOLOGY (WATER)

Bureau Veritas ID		AWM114	
Sampling Date		2022/07/04 12:00	
COC Number		62453	
	UNITS	POND B	QC Batch
Rainbow Trout Bioassay			
LC50	% vol/vol	ATTACHED	A632619



GENERAL COMMENTS

Each temperature is the average of up to three cooler temperatures taken at receipt

Package 1	8.0°C
Package 2	6.3°C
Package 3	7.0°C
Package 4	7.3°C
Package 5	6.0°C

Results relate only to the items tested.



**BUREAU
VERITAS**

Bureau Veritas Job #: C247502
Report Date: 2022/07/09

ALS ENVIRONMENTAL
Client Project #: EO2205135

VALIDATION SIGNATURE PAGE

The analytical data and all QC contained in this report were reviewed and validated by:

A handwritten signature in blue ink, appearing to read 'Cara Shurgot', written over a horizontal line.

Cara Shurgot, Analyst 2

Bureau Veritas has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per ISO/IEC 17025, signing the reports. For Service Group specific validation please refer to the Validation Signature Page.



Chain of Custody
 Edmonton - Environmental
 9450 - 17 Avenue NW
 Edmonton AB Canada T6N 1M9

051(5)

62453



Destination Lab: **Bureau Veritas (Edmonton)**

Address: 9331 - 48th Street Edmonton AB Canada
T6B 2R4

Work Order Number: **EO2205135**

Original Receipt Date/Time: 04/07/2022 17:45
 Instructions Received

Relinquished By

Date/Time

Received By

Date/Time

Receipt Temp

Return as Indicated: Results: ALSEDClientServices@alsglobal.com Invoice: ALSEDClientServices@alsglobal.com Electronic Data: ALSEDClientServices@alsglobal.com
 Attention: Pamela Toledo

ALS Sample ID	Client ID	Matrix	Container Type	Test Codes	Method Description	Due Date	Sampling Date and Time	Remarks
EO2205135-001	Pond B	Water	LDPE carboy	TRT-LC50-96	Survival/LC50 Rainbow Trout (96 hours) x 4	06-07-2022	04/07/2022 12:00	
EO2205135-001	Pond B	Water	LDPE carboy			06-07-2022	04/07/2022 12:00	
EO2205135-001	Pond B	Water	LDPE carboy			06-07-2022	04/07/2022 12:00	
EO2205135-001	Pond B	Water	LDPE carboy	DAP-LC50-48	Survival/LC50 Daphnia Magna 48 hours x 2	06-07-2022	04/07/2022 12:00	
EO2205135-001	Pond B	Water	LDPE carboy			06-07-2022	04/07/2022 12:00	

P4 - Due @ 08-JUL-2022

Temp See ACTR

Deji Wu

D

2022/07/05 09:50

Job# C247502



Chain of Custody (COC) / Analytical Request Form

Canada Toll Free: 1 800 668 9878

Contact and company name below will appear on the final report

Reports / Recipients

Turnaround Time (TAT) Requested

AFFIX ALS BARCODE LABEL HERE (ALS use only)

Company: Clean Harbors Canada	Select Report Format: <input checked="" type="checkbox"/> PDF <input checked="" type="checkbox"/> EXCEL <input type="checkbox"/> EBD (DIGITAL)
Contact: Todd Webb, Stan Yulha	Merge QC/QCI Reports with COA <input type="checkbox"/> YES <input type="checkbox"/> NO <input type="checkbox"/> N/A
Phone: (780) 663-2513	<input type="checkbox"/> Compare Results to Criteria on Report - provide details below if box checked
Street: PO Box 390, 50114 Range Road 173	Select Distribution: <input checked="" type="checkbox"/> EMAIL <input type="checkbox"/> MAIL <input type="checkbox"/> FAX
City/Province: Ryley, AB	Email 1 or Fax web: todd@cleanharbors.com
Postal Code: T0B 4A0	Email 2: yulha.stan@cleanharbors.com
Invoice To: Same as Report To <input type="checkbox"/> YES <input type="checkbox"/> NO	Email 3:
Company: Clean Harbors Canada	Select Invoice Distribution: <input type="checkbox"/> EMAIL <input type="checkbox"/> MAIL <input type="checkbox"/> FAX
Contact: Robbi Gooding	Email 1 or Fax: gooding.robbi@cleanharbors.com

ALS Account # / Quote #: Q82442 (Table 4.3B)	AFE/Cost Center:	PO#:
Job #: Pond B July 4	Major/Minor Code:	Routing Code:
PO / AFE:	Requisitioner:	Location:
LSD: Table 4.3B	ALS Contact: Pamela Toledo	Sampler: Todd Webb
ALS Lab Work Order # (ALS use only): E02205135	Date: 4-Jul-22	Time: 12:00
ALS Sample # (ALS use only): Pond B	Date: (dd-mm-yy)	Time: (hh:mm)
Sample Identification and/or Coordinates (This description will appear on the report)	Sample Type: Surface Water	Number of Containers:

Table 4.3B	Trout 96 hr multi conc. Acute Lethality	Daphnia 48 hr Static acute lethality test	Indicate Filtered (F), Preserved (P) or Filtered and Preserved (FP) below
Table 4.3B	P2	P4	
	P4	P4	

Analysis Request

For all tests with rush TATs requested, please contact your AM to confirm availability.

Additional fees may apply to rush requests on weekends, statutory holidays and for non-routine tests.

Turnaround Time (TAT) Requested

Routine [R] if received by 3pm M-F - no surcharges apply

4 day [P4] if received by 3pm M-F - 20% rush surcharge minimum

3 day [P3] if received by 3pm M-F - 25% rush surcharge minimum

2 day [P2] if received by 3pm M-F - 50% rush surcharge minimum

1 day [E] if received by 3pm M-F - 100% rush surcharge minimum

Same day [E2] if received by 10am M-S - 200% rush surcharge.

Drinking Water (DW) Samples: (client use)

Are samples taken from a Regulated DW System? YES NO

Are samples for human consumption/use? YES NO

Please rush. Analyze as per Table 4.3B (attached), including trout and Daphnia bioassays.

Same analysis as EO2202394

Notes / Specify Limits for result evaluation by selecting from drop-down below (Excel COC only)

SHIPPING RELEASE (client use)

Released by: Todd Webb Date: 24-Jun-22 Time: 8:00

INITIAL SHIPMENT RECEPTION (ALS use only)

Received by: [Signature] Date: 4-Jul-2022 Time: 5:54pm

FINAL SHIPMENT RECEPTION (ALS use only)

Received by: Date:

NUMBER OF CONTAINERS

SAMPLE RE...

Cooling Method: NONE ICE ICE PACKS FROZEN COOLING INITIATED

Submission Comments Identified on Sample Receipt Notification: YES NO

Cooler Custody Seals Intact: YES N/A Sample Custody Seals Intact: YES N/A

INITIAL COOLER TEMPERATURES °C: 14.6

FINAL COOLER TEMPERATURES °C:

Telephone: +1 780 413 5227

Environmental Division

Edmonton

Work Order Reference

EO2205135

ALS 2022 FORM 7

48 hr Static Acute Lethality test using *Daphnia Magna*

PARAMETER	LIMITS
	Maximum unless otherwise indicated
pH	6.0 - 9.5 pH units
COD	50 mg/L
TDS	2500 mg/L
TSS	25 mg/L
Ammonia (expressed as Nitrogen)	5 mg/L
Chloride	250 mg/L
Sodium	200 mg/L
Sulphate	500 mg/L
Oil or other substances	Not present in amounts sufficient to create a visible film or sheen
96-Hour Multiple Concentration Acute Lethality Test Using Rainbow Trout (<i>Oncorhynchus mykiss</i>)	50% or greater survival

TABLE 4.3-B: RUNOFF LIMITS FOR SURFACE WATER DETENTION POND

Appendix D
Ponds B and C
Annual Monitoring – TABLE 4.3-E
October 2022

CERTIFICATE OF ANALYSIS

Work Order	: EO2208443	Page	: 1 of 8
Amendment	: 1		
Client	: Clean Harbors Environmental Services, Inc.	Laboratory	: Edmonton - Environmental
Contact	: Todd Webb	Account Manager	: Pamela Toledo
Address	: PO Box 390, 50114 Range Road 173 AB Canada T0B4A0	Address	: 9450 - 17 Avenue NW Edmonton AB Canada T6N 1M9
Telephone	: 780 663 2513	Telephone	: +1 780 413 5227
Project	: Pond B and C Oct 3	Date Samples Received	: 03-Oct-2022 15:30
PO	: 228509	Date Analysis	: 05-Oct-2022
		Commenced	
C-O-C number	: ----	Issue Date	: 09-Nov-2022 12:36
Sampler	: TW		
Site	: Table 4.3B + Table 4.3E		
Quote number	: Q82439 / Q82442		
No. of samples received	: 2		
No. of samples analysed	: 2		

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>
Alex Drake	Lab Analyst	Inorganics, Edmonton, Alberta
Amanda Powell	Account Manager	External Subcontracting, Edmonton, Alberta
Amanda Powell	Client Service Manager	Internal Subcontracting, Kelso, Washington DC (District of Columbia)
Angeli Marzan	Lab Analyst	Inorganics, Edmonton, Alberta
Austin Wasylyshyn	Lab Analyst	Metals, Edmonton, Alberta
Christian Murera	Lab Analyst	Organics, Edmonton, Alberta
Dan Nguyen	Team Leader - Inorganics	Inorganics, Edmonton, Alberta
Dan Nguyen	Team Leader - Inorganics	Metals, Edmonton, Alberta
Daniel Nguyen	Lab Assistant	Inorganics, Edmonton, Alberta
Janice Leung	Supervisor - Organics Instrumentation	Organics, Burnaby, British Columbia
Jing Liu	Lab Assistant	Inorganics, Edmonton, Alberta
Joan Wu	Lab Analyst	Metals, Edmonton, Alberta
Jocelyn Kennedy	Department Manager - Semi-Volatile Organics	Organics, Waterloo, Ontario
Jon Fisher	Department Manager - Inorganics	Inorganics, Waterloo, Ontario
Muzammil Ali	Lab Analyst	Inorganics, Edmonton, Alberta
Ping Yeung	Team Leader - Inorganics	Inorganics, Edmonton, Alberta
Samantha Mayor	Lab Assistant	Inorganics, Edmonton, Alberta
Shruti Mudliar	Lab Analyst	Inorganics, Edmonton, Alberta
Sobhithan Pillay		Inorganics, Edmonton, Alberta
Yan Zhang	Lab Analyst	Organics, 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).

<i>Unit</i>	<i>Description</i>
-	No Unit
%	percent
µg/L	micrograms per litre
µS/cm	Microsiemens per centimetre
mg/L	milligrams per litre
pH units	pH units

>: greater than.

<: less 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

<i>Qualifier</i>	<i>Description</i>
DTC	Dissolved concentration exceeds total. Results were confirmed by re-analysis.



Analytical Results

EO2208443-001

Sub-Matrix: Water

(Matrix: Water)

Client sample ID: Pond B -

Client sampling date / time: 03-Oct-2022 00:00

Analyte	CAS Number	Result	LOR	Unit	Method	Prep Date	Analysis Date	QCLot
Physical Tests								
alkalinity, bicarbonate (as HCO3)	71-52-3	223	1.0	mg/L	E290	05-Oct-2022	05-Oct-2022	682038
alkalinity, carbonate (as CO3)	3812-32-6	6.1	1.0	mg/L	E290	05-Oct-2022	05-Oct-2022	682038
alkalinity, hydroxide (as OH)	14280-30-9	<1.0	1.0	mg/L	E290	05-Oct-2022	05-Oct-2022	682038
conductivity	----	1320	1.0	µS/cm	E100	05-Oct-2022	05-Oct-2022	682036
pH	----	8.54	0.10	pH units	E108	05-Oct-2022	05-Oct-2022	682037
solids, total dissolved [TDS]	----	933	20	mg/L	E162	-	06-Oct-2022	683794
solids, total dissolved [TDS], calculated	----	963	1.0	mg/L	EC103	-	06-Oct-2022	-
solids, total suspended [TSS]	----	21.6	3.0	mg/L	E160	-	05-Oct-2022	681561
Anions and Nutrients								
ammonia, total (as N)	7664-41-7	0.0399	0.0050	mg/L	E298	12-Oct-2022	12-Oct-2022	691785
chloride	16887-00-6	42.4	0.50	mg/L	E235.Cl	05-Oct-2022	05-Oct-2022	682269
fluoride	16984-48-8	1.32	0.020	mg/L	E235.F	05-Oct-2022	05-Oct-2022	682273
nitrate (as N)	14797-55-8	0.022	0.020	mg/L	E235.NO3	05-Oct-2022	05-Oct-2022	682271
nitrate + nitrite (as N)	----	<0.0224	0.0224	mg/L	EC235.N+N	-	07-Oct-2022	-
nitrite (as N)	14797-65-0	<0.010	0.010	mg/L	E235.NO2	05-Oct-2022	05-Oct-2022	682272
phosphorus, total	7723-14-0	0.0614	0.0010	mg/L	E372-S	10-Oct-2022	13-Oct-2022	688839
phosphorus, total dissolved	7723-14-0	0.0390	0.0010	mg/L	E375-U	10-Oct-2022	14-Oct-2022	688347
sulfate (as SO4)	14808-79-8	478	0.30	mg/L	E235.SO4	05-Oct-2022	05-Oct-2022	682270
Kjeldahl nitrogen, total [TKN]	----	1.59	0.200	mg/L	E318	19-Oct-2022	20-Oct-2022	702163
Cyanides								
cyanide, weak acid dissociable	----	<0.0050	0.0050	mg/L	E336	05-Oct-2022	05-Oct-2022	681970
Organic / Inorganic Carbon								
carbon, dissolved organic [DOC]	----	18.6	0.50	mg/L	E358-L	07-Oct-2022	07-Oct-2022	686272
Ion Balance								
ion balance (cations/anions)	----	95.4	0.010	%	EC101	-	06-Oct-2022	-
Total Metals								
chromium, total	7440-47-3	0.00316	0.00050	mg/L	E420	11-Oct-2022	12-Oct-2022	689839
mercury, total	7439-97-6	0.0000061	0.0000050	mg/L	E508	06-Oct-2022	06-Oct-2022	683187
Dissolved Metals								
aluminum, dissolved	7429-90-5	0.0136	0.0010	mg/L	E421	11-Oct-2022	12-Oct-2022	689921
antimony, dissolved	7440-36-0	0.00064	0.00010	mg/L	E421	11-Oct-2022	12-Oct-2022	689921
arsenic, dissolved	7440-38-2	0.00102	0.00010	mg/L	E421	11-Oct-2022	12-Oct-2022	689921
barium, dissolved	7440-39-3	0.0584	0.00010	mg/L	E421	11-Oct-2022	12-Oct-2022	689921
beryllium, dissolved	7440-41-7	<0.000020	0.000020	mg/L	E421	11-Oct-2022	12-Oct-2022	689921
bismuth, dissolved	7440-69-9	<0.000050	0.000050	mg/L	E421	11-Oct-2022	12-Oct-2022	689921
boron, dissolved	7440-42-8	0.102	0.010	mg/L	E421	11-Oct-2022	12-Oct-2022	689921
cadmium, dissolved	7440-43-9	0.0000734	0.0000050	mg/L	E421	11-Oct-2022	12-Oct-2022	689921
calcium, dissolved	7440-70-2	44.5	0.050	mg/L	E421	11-Oct-2022	12-Oct-2022	689921
chromium, dissolved	7440-47-3	<0.00050	0.00050	mg/L	E421	11-Oct-2022	12-Oct-2022	689921
cobalt, dissolved	7440-48-4	0.00023	0.00010	mg/L	E421	11-Oct-2022	12-Oct-2022	689921
copper, dissolved	7440-50-8	0.0107	0.00020	mg/L	E421	11-Oct-2022	13-Oct-2022	689921
iron, dissolved	7439-89-6	<0.010	0.010	mg/L	E421	11-Oct-2022	12-Oct-2022	689921
lead, dissolved	7439-92-1	0.000052	0.000050	mg/L	E421	11-Oct-2022	12-Oct-2022	689921
magnesium, dissolved	7439-95-4	23.8	0.0050	mg/L	E421	11-Oct-2022	12-Oct-2022	689921
manganese, dissolved	7439-96-5	0.0121	0.00010	mg/L	E421	11-Oct-2022	12-Oct-2022	689921
molybdenum, dissolved	7439-98-7	0.156	0.000050	mg/L	E421	11-Oct-2022	12-Oct-2022	689921



Analytical Results

EO2208443-001

Sub-Matrix: Water

(Matrix: Water)

Client sample ID: Pond B -

Client sampling date / time: 03-Oct-2022 00:00

Analyte	CAS Number	Result	LOR	Unit	Method	Prep Date	Analysis Date	QC/Lot
Dissolved Metals								
nickel, dissolved	7440-02-0	0.0105	0.00050	mg/L	E421	11-Oct-2022	12-Oct-2022	689921
potassium, dissolved	7440-09-7	8.38	0.050	mg/L	E421	11-Oct-2022	12-Oct-2022	689921
selenium, dissolved	7782-49-2	0.000665	0.000050	mg/L	E421	11-Oct-2022	12-Oct-2022	689921
silver, dissolved	7440-22-4	<0.000010	0.000010	mg/L	E421	11-Oct-2022	12-Oct-2022	689921
sodium, dissolved	7440-23-5	230	0.050	mg/L	E421	11-Oct-2022	12-Oct-2022	689921
strontium, dissolved	7440-24-6	0.623	0.00020	mg/L	E421	11-Oct-2022	12-Oct-2022	689921
thallium, dissolved	7440-28-0	0.000010	0.000010	mg/L	E421	11-Oct-2022	12-Oct-2022	689921
tin, dissolved	7440-31-5	<0.00010	0.00010	mg/L	E421	11-Oct-2022	12-Oct-2022	689921
uranium, dissolved	7440-61-1	0.00623	0.000010	mg/L	E421	11-Oct-2022	12-Oct-2022	689921
vanadium, dissolved	7440-62-2	0.00311	0.00050	mg/L	E421	11-Oct-2022	12-Oct-2022	689921
zinc, dissolved	7440-66-6	0.0021	0.0010	mg/L	E421	11-Oct-2022	12-Oct-2022	689921
zirconium, dissolved	7440-67-7	<0.00020	0.00020	mg/L	E421	11-Oct-2022	12-Oct-2022	689921
dissolved metals filtration location	----	Field	-	-	EP421	-	11-Oct-2022	689921
Speciated Metals								
chromium, hexavalent [Cr VI], dissolved	18540-29-9	<0.00050	0.00050	mg/L	E532A	-	06-Oct-2022	683703
Aggregate Organics								
adsorbable organic halogens, [AOX], (as Cl)	----	See Attached	10	mg/L	AOX	-	14-Oct-2022	-
chemical oxygen demand [COD]	----	48	10	mg/L	E559-L	-	11-Oct-2022	689766
phenols, total (4AAP)	----	<0.0010	0.0010	mg/L	E562	10-Oct-2022	10-Oct-2022	687934
Volatile Organic Compounds								
benzene	71-43-2	<0.50	0.50	µg/L	E611A	19-Oct-2022	19-Oct-2022	703933
ethylbenzene	100-41-4	<0.50	0.50	µg/L	E611A	19-Oct-2022	19-Oct-2022	703933
toluene	108-88-3	<0.50	0.50	µg/L	E611A	19-Oct-2022	19-Oct-2022	703933
xylene, m+p-	179601-23-1	<0.40	0.40	µg/L	E611A	19-Oct-2022	19-Oct-2022	703933
xylene, o-	95-47-6	<0.30	0.30	µg/L	E611A	19-Oct-2022	19-Oct-2022	703933
xylenes, total	1330-20-7	<0.50	0.50	µg/L	E611A	19-Oct-2022	19-Oct-2022	703933
Hydrocarbons								
F1 (C6-C10)	----	<100	100	µg/L	E581.F1	19-Oct-2022	19-Oct-2022	703934
F1-BTEX	----	<100	100	µg/L	EC580	-	20-Oct-2022	-
F2 (C10-C16)	----	<100	100	µg/L	E601	19-Oct-2022	19-Oct-2022	703963
Hydrocarbons Surrogates								
bromobenzotrifluoride, 2- (F2-F4 surr)	392-83-6	101	1.0	%	E601	19-Oct-2022	19-Oct-2022	703963
dichlorotoluene, 3,4-	97-75-0	115	1.0	%	E581.F1	19-Oct-2022	19-Oct-2022	703934
Volatile Organic Compounds Surrogates								
bromofluorobenzene, 4-	460-00-4	81.3	1.0	%	E611A	19-Oct-2022	19-Oct-2022	703933
difluorobenzene, 1,4-	540-36-3	90.6	1.0	%	E611A	19-Oct-2022	19-Oct-2022	703933
Chlorinated Phenolics								
chlorophenol, 2-	95-57-8	<0.30	0.30	µg/L	E651C	06-Oct-2022	07-Oct-2022	683686
dichlorophenol, 2,4-	120-83-2	<0.20	0.20	µg/L	E651C	06-Oct-2022	07-Oct-2022	683686
dichlorophenol, 2,6-	87-65-0	<0.20	0.20	µg/L	E651C	06-Oct-2022	07-Oct-2022	683686
methylphenol, 4-chloro-3-	59-50-7	<0.50	0.50	µg/L	E651C	06-Oct-2022	07-Oct-2022	683686
pentachlorophenol [PCP]	87-86-5	<0.50	0.50	µg/L	E651C	06-Oct-2022	07-Oct-2022	683686
tetrachlorophenol, 2,3,4,5-	4901-51-3	<0.50	0.50	µg/L	E651C	06-Oct-2022	07-Oct-2022	683686
tetrachlorophenol, 2,3,4,6-	58-90-2	<0.50	0.50	µg/L	E651C	06-Oct-2022	07-Oct-2022	683686
tetrachlorophenol, 2,3,5,6-	935-95-5	<0.50	0.50	µg/L	E651C	06-Oct-2022	07-Oct-2022	683686
trichlorophenol, 2,3,4-	15950-66-0	<0.50	0.50	µg/L	E651C	06-Oct-2022	07-Oct-2022	683686



Analytical Results

EO2208443-001

Sub-Matrix: Water

(Matrix: Water)

Client sample ID: Pond B -

Client sampling date / time: 03-Oct-2022 00:00

Analyte	CAS Number	Result	LOR	Unit	Method	Prep Date	Analysis Date	QCLot
Chlorinated Phenolics								
trichlorophenol, 2,3,5-	933-78-8	<0.50	0.50	µg/L	E651C	06-Oct-2022	07-Oct-2022	683686
trichlorophenol, 2,4,5-	95-95-4	<0.50	0.50	µg/L	E651C	06-Oct-2022	07-Oct-2022	683686
trichlorophenol, 2,4,6-	88-06-2	<0.50	0.50	µg/L	E651C	06-Oct-2022	07-Oct-2022	683686
Non-Chlorinated Phenolics								
dimethylphenol, 2,4-	105-67-9	<0.50	0.50	µg/L	E651C	06-Oct-2022	07-Oct-2022	683686
dinitrophenol, 2,4-	51-28-5	<1.0	1.0	µg/L	E651C	06-Oct-2022	07-Oct-2022	683686
methylphenol, 2-	95-48-7	<0.50	0.50	µg/L	E651C	06-Oct-2022	07-Oct-2022	683686
methylphenol, 3+4-	----	<0.50	0.50	µg/L	E651C	06-Oct-2022	07-Oct-2022	683686
methylphenols, total	----	<0.75	0.75	µg/L	E651C	06-Oct-2022	07-Oct-2022	683686
nitrophenol, 2-	88-75-5	<0.50	0.50	µg/L	E651C	06-Oct-2022	07-Oct-2022	683686
nitrophenol, 4-	100-02-7	<0.50	0.50	µg/L	E651C	06-Oct-2022	07-Oct-2022	683686
phenol	108-95-2	<0.50	0.50	µg/L	E651C	06-Oct-2022	07-Oct-2022	683686
phenol, 2-methyl-4,6-dinitro- [DNOC]	534-52-1	<2.0	2.0	µg/L	E651C	06-Oct-2022	07-Oct-2022	683686
Phenolics Surrogates								
tribromophenol, 2,4,6-	118-79-6	98.1	1.0	%	E651C	06-Oct-2022	07-Oct-2022	683686
Polychlorinated Biphenyls								
Aroclor 1016	12674-11-2	<1.0	1.0	µg/L	E685	05-Oct-2022	06-Oct-2022	682338
Aroclor 1221	11104-28-2	<1.0	1.0	µg/L	E685	05-Oct-2022	06-Oct-2022	682338
Aroclor 1232	11141-16-5	<1.0	1.0	µg/L	E685	05-Oct-2022	06-Oct-2022	682338
Aroclor 1242	53469-21-9	<1.0	1.0	µg/L	E685	05-Oct-2022	06-Oct-2022	682338
Aroclor 1248	12672-29-6	<1.0	1.0	µg/L	E685	05-Oct-2022	06-Oct-2022	682338
Aroclor 1254	11097-69-1	<1.0	1.0	µg/L	E685	05-Oct-2022	06-Oct-2022	682338
Aroclor 1260	11096-82-5	<1.0	1.0	µg/L	E685	05-Oct-2022	06-Oct-2022	682338
Aroclor 1262	37324-23-5	<1.0	1.0	µg/L	E685	05-Oct-2022	06-Oct-2022	682338
Aroclor 1268	11100-14-4	<1.0	1.0	µg/L	E685	05-Oct-2022	06-Oct-2022	682338
polychlorinated biphenyls [PCBs], total	----	<1.0	1.0	µg/L	E685	05-Oct-2022	06-Oct-2022	682338
Polychlorinated Biphenyls Surrogates								
decachlorobiphenyl	2051-24-3	92.5	1.0	%	E685	05-Oct-2022	06-Oct-2022	682338

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

Analytical Results

EO2208443-002

Sub-Matrix: Water

(Matrix: Water)

Client sample ID: Pond C -

Client sampling date / time: 03-Oct-2022 00:00

Analyte	CAS Number	Result	LOR	Unit	Method	Prep Date	Analysis Date	QCLot
Physical Tests								
alkalinity, bicarbonate (as HCO3)	71-52-3	188	1.0	mg/L	E290	05-Oct-2022	05-Oct-2022	682038
alkalinity, carbonate (as CO3)	3812-32-6	2.2	1.0	mg/L	E290	05-Oct-2022	05-Oct-2022	682038
alkalinity, hydroxide (as OH)	14280-30-9	<1.0	1.0	mg/L	E290	05-Oct-2022	05-Oct-2022	682038
conductivity	----	1380	1.0	µS/cm	E100	05-Oct-2022	05-Oct-2022	682036
pH	----	8.37	0.10	pH units	E108	05-Oct-2022	05-Oct-2022	682037
solids, total dissolved [TDS]	----	988	20	mg/L	E162	-	06-Oct-2022	683794
solids, total dissolved [TDS], calculated	----	1000	1.0	mg/L	EC103	-	06-Oct-2022	-



Analytical Results

EO2208443-002

Sub-Matrix: Water

(Matrix: Water)

Client sample ID: Pond C -

Client sampling date / time: 03-Oct-2022 00:00

Analyte	CAS Number	Result	LOR	Unit	Method	Prep Date	Analysis Date	QCLot
Physical Tests								
solids, total suspended [TSS]	----	19.0	3.0	mg/L	E160	-	05-Oct-2022	681561
Anions and Nutrients								
ammonia, total (as N)	7664-41-7	0.0225	0.0050	mg/L	E298	12-Oct-2022	12-Oct-2022	691785
chloride	16887-00-6	72.8	0.50	mg/L	E235.Cl	05-Oct-2022	05-Oct-2022	682269
fluoride	16984-48-8	0.861	0.020	mg/L	E235.F	05-Oct-2022	05-Oct-2022	682273
nitrate (as N)	14797-55-8	<0.020	0.020	mg/L	E235.NO3	05-Oct-2022	05-Oct-2022	682271
nitrate + nitrite (as N)	----	<0.0224	0.0224	mg/L	EC235.N+N	-	07-Oct-2022	-
nitrite (as N)	14797-65-0	<0.010	0.010	mg/L	E235.NO2	05-Oct-2022	05-Oct-2022	682272
phosphorus, total	7723-14-0	0.117	0.0050	mg/L	E372-S	10-Oct-2022	13-Oct-2022	688839
phosphorus, total dissolved	7723-14-0	0.0250	0.0010	mg/L	E375-U	10-Oct-2022	14-Oct-2022	688347
sulfate (as SO4)	14808-79-8	502	0.30	mg/L	E235.SO4	05-Oct-2022	05-Oct-2022	682270
Kjeldahl nitrogen, total [TKN]	----	2.32	0.200	mg/L	E318	19-Oct-2022	20-Oct-2022	702163
Cyanides								
cyanide, weak acid dissociable	----	<0.0050	0.0050	mg/L	E336	05-Oct-2022	05-Oct-2022	681970
Organic / Inorganic Carbon								
carbon, dissolved organic [DOC]	----	17.0	0.50	mg/L	E358-L	07-Oct-2022	07-Oct-2022	686272
Bioassays								
trout bioassay LC50	----	See attached	-	-	TRT-LC50-96	-	14-Oct-2022	-
Ion Balance								
ion balance (cations/anions)	----	92.4	0.010	%	EC101	-	06-Oct-2022	-
Total Metals								
chromium, total	7440-47-3	0.00104	0.00050	mg/L	E420	11-Oct-2022	12-Oct-2022	689839
mercury, total	7439-97-6	0.0000053	0.0000050	mg/L	E508	06-Oct-2022	06-Oct-2022	683187
Dissolved Metals								
aluminum, dissolved	7429-90-5	0.0703	0.0010	mg/L	E421	11-Oct-2022	12-Oct-2022	689921
antimony, dissolved	7440-36-0	0.00070	0.00010	mg/L	E421	11-Oct-2022	12-Oct-2022	689921
arsenic, dissolved	7440-38-2	0.00205	0.00010	mg/L	E421	11-Oct-2022	12-Oct-2022	689921
barium, dissolved	7440-39-3	0.0536	0.00010	mg/L	E421	11-Oct-2022	12-Oct-2022	689921
beryllium, dissolved	7440-41-7	<0.000020	0.000020	mg/L	E421	11-Oct-2022	12-Oct-2022	689921
bismuth, dissolved	7440-69-9	<0.000050	0.000050	mg/L	E421	11-Oct-2022	12-Oct-2022	689921
boron, dissolved	7440-42-8	0.084	0.010	mg/L	E421	11-Oct-2022	12-Oct-2022	689921
cadmium, dissolved	7440-43-9	0.0000432	0.0000050	mg/L	E421	11-Oct-2022	12-Oct-2022	689921
calcium, dissolved	7440-70-2	49.7	0.050	mg/L	E421	11-Oct-2022	12-Oct-2022	689921
chromium, dissolved	7440-47-3	0.00068	0.00050	mg/L	E421	11-Oct-2022	12-Oct-2022	689921
cobalt, dissolved	7440-48-4	0.00013	0.00010	mg/L	E421	11-Oct-2022	12-Oct-2022	689921
copper, dissolved	7440-50-8	0.00432	0.00020	mg/L	E421	11-Oct-2022	12-Oct-2022	689921
iron, dissolved	7439-89-6	0.044	0.010	mg/L	E421	11-Oct-2022	12-Oct-2022	689921
lead, dissolved	7439-92-1	0.000097	0.000050	mg/L	E421	11-Oct-2022	12-Oct-2022	689921
magnesium, dissolved	7439-95-4	20.9	0.0050	mg/L	E421	11-Oct-2022	12-Oct-2022	689921
manganese, dissolved	7439-96-5	0.00223	0.00010	mg/L	E421	11-Oct-2022	12-Oct-2022	689921
molybdenum, dissolved	7439-98-7	0.115	0.000050	mg/L	E421	11-Oct-2022	12-Oct-2022	689921
nickel, dissolved	7440-02-0	0.0125	0.00050	mg/L	E421	11-Oct-2022	12-Oct-2022	689921
potassium, dissolved	7440-09-7	6.81	0.050	mg/L	E421	11-Oct-2022	12-Oct-2022	689921
selenium, dissolved	7782-49-2	0.000481	0.000050	mg/L	E421	11-Oct-2022	12-Oct-2022	689921
silver, dissolved	7440-22-4	<0.000010	0.000010	mg/L	E421	11-Oct-2022	12-Oct-2022	689921
sodium, dissolved	7440-23-5	233	0.050	mg/L	E421	11-Oct-2022	12-Oct-2022	689921



Analytical Results

EO2208443-002

Sub-Matrix: Water

(Matrix: Water)

Client sample ID: Pond C -

Client sampling date / time: 03-Oct-2022 00:00

Analyte	CAS Number	Result	LOR	Unit	Method	Prep Date	Analysis Date	QCLot
Dissolved Metals								
strontium, dissolved	7440-24-6	0.507	0.00020	mg/L	E421	11-Oct-2022	12-Oct-2022	689921
thallium, dissolved	7440-28-0	<0.000010	0.000010	mg/L	E421	11-Oct-2022	12-Oct-2022	689921
tin, dissolved	7440-31-5	<0.00010	0.00010	mg/L	E421	11-Oct-2022	12-Oct-2022	689921
uranium, dissolved	7440-61-1	0.00454	0.000010	mg/L	E421	11-Oct-2022	12-Oct-2022	689921
vanadium, dissolved	7440-62-2	0.0107	0.00050	mg/L	E421	11-Oct-2022	12-Oct-2022	689921
zinc, dissolved	7440-66-6	0.0032	0.0010	mg/L	E421	11-Oct-2022	12-Oct-2022	689921
zirconium, dissolved	7440-67-7	<0.00020	0.00020	mg/L	E421	11-Oct-2022	12-Oct-2022	689921
dissolved metals filtration location	----	Field	-	-	EP421	-	11-Oct-2022	689921
Speciated Metals								
chromium, hexavalent [Cr VI], dissolved	18540-29-9	<0.00050	0.00050	mg/L	E532A	-	06-Oct-2022	683703
Aggregate Organics								
adsorbable organic halogens, [AOX], (as Cl)	----	See Attached	10	mg/L	AOX	-	14-Oct-2022	-
chemical oxygen demand [COD]	----	40	10	mg/L	E559-L	-	11-Oct-2022	689766
oil & grease (visible sheen)	----	Absent	-	-	E566	-	06-Oct-2022	-
phenols, total (4AAP)	----	<0.0010	0.0010	mg/L	E562	10-Oct-2022	10-Oct-2022	687934
Volatile Organic Compounds								
benzene	71-43-2	<0.50	0.50	µg/L	E611A	19-Oct-2022	19-Oct-2022	703933
ethylbenzene	100-41-4	<0.50	0.50	µg/L	E611A	19-Oct-2022	19-Oct-2022	703933
toluene	108-88-3	<0.50	0.50	µg/L	E611A	19-Oct-2022	19-Oct-2022	703933
xylene, m+p-	179601-23-1	<0.40	0.40	µg/L	E611A	19-Oct-2022	19-Oct-2022	703933
xylene, o-	95-47-6	<0.30	0.30	µg/L	E611A	19-Oct-2022	19-Oct-2022	703933
xylenes, total	1330-20-7	<0.50	0.50	µg/L	E611A	19-Oct-2022	19-Oct-2022	703933
Hydrocarbons								
F1 (C6-C10)	----	<100	100	µg/L	E581.F1	19-Oct-2022	19-Oct-2022	703934
F1-BTEX	----	<100	100	µg/L	EC580	-	20-Oct-2022	-
F2 (C10-C16)	----	<100	100	µg/L	E601	19-Oct-2022	19-Oct-2022	703963
Hydrocarbons Surrogates								
bromobenzotrifluoride, 2- (F2-F4 surr)	392-83-6	103	1.0	%	E601	19-Oct-2022	19-Oct-2022	703963
dichlorotoluene, 3,4-	97-75-0	104	1.0	%	E581.F1	19-Oct-2022	19-Oct-2022	703934
Volatile Organic Compounds Surrogates								
bromofluorobenzene, 4-	460-00-4	80.0	1.0	%	E611A	19-Oct-2022	19-Oct-2022	703933
difluorobenzene, 1,4-	540-36-3	93.9	1.0	%	E611A	19-Oct-2022	19-Oct-2022	703933
Chlorinated Phenolics								
chlorophenol, 2-	95-57-8	<0.30	0.30	µg/L	E651C	06-Oct-2022	07-Oct-2022	683686
dichlorophenol, 2,4-	120-83-2	<0.20	0.20	µg/L	E651C	06-Oct-2022	07-Oct-2022	683686
dichlorophenol, 2,6-	87-65-0	<0.20	0.20	µg/L	E651C	06-Oct-2022	07-Oct-2022	683686
methylphenol, 4-chloro-3-	59-50-7	<0.50	0.50	µg/L	E651C	06-Oct-2022	07-Oct-2022	683686
pentachlorophenol [PCP]	87-86-5	<0.50	0.50	µg/L	E651C	06-Oct-2022	07-Oct-2022	683686
tetrachlorophenol, 2,3,4,5-	4901-51-3	<0.50	0.50	µg/L	E651C	06-Oct-2022	07-Oct-2022	683686
tetrachlorophenol, 2,3,4,6-	58-90-2	<0.50	0.50	µg/L	E651C	06-Oct-2022	07-Oct-2022	683686
tetrachlorophenol, 2,3,5,6-	935-95-5	<0.50	0.50	µg/L	E651C	06-Oct-2022	07-Oct-2022	683686
trichlorophenol, 2,3,4-	15950-66-0	<0.50	0.50	µg/L	E651C	06-Oct-2022	07-Oct-2022	683686
trichlorophenol, 2,3,5-	933-78-8	<0.50	0.50	µg/L	E651C	06-Oct-2022	07-Oct-2022	683686
trichlorophenol, 2,4,5-	95-95-4	<0.50	0.50	µg/L	E651C	06-Oct-2022	07-Oct-2022	683686
trichlorophenol, 2,4,6-	88-06-2	<0.50	0.50	µg/L	E651C	06-Oct-2022	07-Oct-2022	683686
Non-Chlorinated Phenolics								



Analytical Results

EO2208443-002

Sub-Matrix: Water

(Matrix: Water)

Client sample ID: Pond C -

Client sampling date / time: 03-Oct-2022 00:00

Analyte	CAS Number	Result	LOR	Unit	Method	Prep Date	Analysis Date	QCLot
Non-Chlorinated Phenolics								
dimethylphenol, 2,4-	105-67-9	<0.50	0.50	µg/L	E651C	06-Oct-2022	07-Oct-2022	683686
dinitrophenol, 2,4-	51-28-5	<1.0	1.0	µg/L	E651C	06-Oct-2022	07-Oct-2022	683686
methylphenol, 2-	95-48-7	<0.50	0.50	µg/L	E651C	06-Oct-2022	07-Oct-2022	683686
methylphenol, 3+4-	----	<0.50	0.50	µg/L	E651C	06-Oct-2022	07-Oct-2022	683686
methylphenols, total	----	<0.75	0.75	µg/L	E651C	06-Oct-2022	07-Oct-2022	683686
nitrophenol, 2-	88-75-5	<0.50	0.50	µg/L	E651C	06-Oct-2022	07-Oct-2022	683686
nitrophenol, 4-	100-02-7	<0.50	0.50	µg/L	E651C	06-Oct-2022	07-Oct-2022	683686
phenol	108-95-2	<0.50	0.50	µg/L	E651C	06-Oct-2022	07-Oct-2022	683686
phenol, 2-methyl-4,6-dinitro- [DNOC]	534-52-1	<2.0	2.0	µg/L	E651C	06-Oct-2022	07-Oct-2022	683686
Phenolics Surrogates								
tribromophenol, 2,4,6-	118-79-6	105	1.0	%	E651C	06-Oct-2022	07-Oct-2022	683686
Polychlorinated Biphenyls								
Aroclor 1016	12674-11-2	<1.0	1.0	µg/L	E685	05-Oct-2022	06-Oct-2022	682338
Aroclor 1221	11104-28-2	<1.0	1.0	µg/L	E685	05-Oct-2022	06-Oct-2022	682338
Aroclor 1232	11141-16-5	<1.0	1.0	µg/L	E685	05-Oct-2022	06-Oct-2022	682338
Aroclor 1242	53469-21-9	<1.0	1.0	µg/L	E685	05-Oct-2022	06-Oct-2022	682338
Aroclor 1248	12672-29-6	<1.0	1.0	µg/L	E685	05-Oct-2022	06-Oct-2022	682338
Aroclor 1254	11097-69-1	<1.0	1.0	µg/L	E685	05-Oct-2022	06-Oct-2022	682338
Aroclor 1260	11096-82-5	<1.0	1.0	µg/L	E685	05-Oct-2022	06-Oct-2022	682338
Aroclor 1262	37324-23-5	<1.0	1.0	µg/L	E685	05-Oct-2022	06-Oct-2022	682338
Aroclor 1268	11100-14-4	<1.0	1.0	µg/L	E685	05-Oct-2022	06-Oct-2022	682338
polychlorinated biphenyls [PCBs], total	----	<1.0	1.0	µg/L	E685	05-Oct-2022	06-Oct-2022	682338
Polychlorinated Biphenyls Surrogates								
decachlorobiphenyl	2051-24-3	67.7	1.0	%	E685	05-Oct-2022	06-Oct-2022	682338

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



QUALITY CONTROL INTERPRETIVE REPORT

<p>Work Order : EO2208443</p> <p>Amendment : 1</p> <p>Client : Clean Harbors Environmental Services, Inc.</p> <p>Contact : Todd Webb</p> <p>Address : PO Box 390, 50114 Range Road 173 AB Canada T0B4A0</p> <p>Telephone : 780 663 2513</p> <p>Project : Pond B and C Oct 3</p> <p>PO : 228509</p> <p>C-O-C number : ----</p> <p>Sampler : TW</p> <p>Site : Table 4.3B + Table 4.3E</p> <p>Quote number : Q82439 / Q82442</p> <p>No. of samples received : 2</p> <p>No. of samples analysed : 2</p>	<p>Page : 1 of 19</p> <p>Laboratory : Edmonton - Environmental</p> <p>Account Manager : Pamela Toledo</p> <p>Address : 9450 - 17 Avenue NW Edmonton, Alberta Canada T6N 1M9</p> <p>Telephone : +1 780 413 5227</p> <p>Date Samples Received : 03-Oct-2022 15:30</p> <p>Issue Date : 09-Nov-2022 12:36</p>
--	--

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 Matrix Spike outliers occur.
- Laboratory Control Sample (LCS) outliers occur - please see following pages for full details.
- 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)

- Analysis Holding Time Outliers exist - please see following pages for full details.

Outliers : Frequency of Quality Control Samples

- No Quality Control Sample Frequency Outliers occur.



Outliers : Quality Control Samples

Duplicates, Method Blanks, Laboratory Control Samples and Matrix Spikes

Matrix: **Water**

Analyte Group	Laboratory sample ID	Client/Ref Sample ID	Analyte	CAS Number	Method	Result	Limits	Comment
Laboratory Control Sample (LCS) Recoveries								
Non-Chlorinated Phenolics	QC-MRG2-6836860 02	----	dinitrophenol, 2,4-	51-28-5	E651C	144 % LCS-H	40.0-130%	Recovery greater than upper control limit
Non-Chlorinated Phenolics	QC-MRG2-6836860 02	----	phenol, 2-methyl-4,6-dinitro- [DNOC]	534-52-1	E651C	149 % LCS-H	40.0-140%	Recovery greater than upper control limit

Result Qualifiers

Qualifier	Description
LCS-H	Lab Control Sample recovery was above ALS DQO. Non-detected sample results are considered reliable. Other results, if reported, have been qualified.



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	
Aggregate Organics : Adsorbable Organic Halides (AOX) by Adsorption and Coulometric										
Amber glass/Teflon lined cap Pond B	AOX	03-Oct-2022	----	----	----		14-Oct-2022	180 days	12 days	✓
Aggregate Organics : Adsorbable Organic Halides (AOX) by Adsorption and Coulometric										
Amber glass/Teflon lined cap Pond C	AOX	03-Oct-2022	----	----	----		14-Oct-2022	180 days	12 days	✓
Aggregate Organics : Chemical Oxygen Demand by Colourimetry (Low Level)										
Amber glass total (sulfuric acid) Pond B	E559-L	03-Oct-2022	----	----	----		11-Oct-2022	28 days	8 days	✓
Aggregate Organics : Chemical Oxygen Demand by Colourimetry (Low Level)										
Amber glass total (sulfuric acid) Pond C	E559-L	03-Oct-2022	----	----	----		11-Oct-2022	28 days	8 days	✓
Aggregate Organics : Oil & Grease by Visible Sheen										
Amber glass (hydrochloric acid) Pond C	E566	03-Oct-2022	----	----	----		06-Oct-2022	28 days	3 days	✓
Aggregate Organics : Phenols (4AAP) in Water by Colorimetry										
Amber glass total (sulfuric acid) Pond B	E562	03-Oct-2022	10-Oct-2022	----	----		10-Oct-2022	28 days	7 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	
Aggregate Organics : Phenols (4AAP) in Water by Colorimetry										
Amber glass total (sulfuric acid) Pond C	E562	03-Oct-2022	10-Oct-2022	----	----		10-Oct-2022	28 days	7 days	✔
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid) Pond B	E298	03-Oct-2022	12-Oct-2022	----	----		12-Oct-2022	28 days	9 days	✔
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid) Pond C	E298	03-Oct-2022	12-Oct-2022	----	----		12-Oct-2022	28 days	9 days	✔
Anions and Nutrients : Chloride in Water by IC										
HDPE Pond B	E235.Cl	03-Oct-2022	05-Oct-2022	----	----		05-Oct-2022	28 days	3 days	✔
Anions and Nutrients : Chloride in Water by IC										
HDPE Pond C	E235.Cl	03-Oct-2022	05-Oct-2022	----	----		05-Oct-2022	28 days	3 days	✔
Anions and Nutrients : Fluoride in Water by IC										
HDPE Pond B	E235.F	03-Oct-2022	05-Oct-2022	----	----		05-Oct-2022	28 days	3 days	✔
Anions and Nutrients : Fluoride in Water by IC										
HDPE Pond C	E235.F	03-Oct-2022	05-Oct-2022	----	----		05-Oct-2022	28 days	3 days	✔
Anions and Nutrients : Nitrate in Water by IC										
HDPE Pond B	E235.NO3	03-Oct-2022	05-Oct-2022	----	----		05-Oct-2022	3 days	3 days	✔
Anions and Nutrients : Nitrate in Water by IC										
HDPE Pond C	E235.NO3	03-Oct-2022	05-Oct-2022	----	----		05-Oct-2022	3 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 : Nitrite in Water by IC											
HDPE Pond B	E235.NO2	03-Oct-2022	05-Oct-2022	----	----		05-Oct-2022	3 days	3 days	✔	
Anions and Nutrients : Nitrite in Water by IC											
HDPE Pond C	E235.NO2	03-Oct-2022	05-Oct-2022	----	----		05-Oct-2022	3 days	3 days	✔	
Anions and Nutrients : Sulfate in Water by IC											
HDPE Pond B	E235.SO4	03-Oct-2022	05-Oct-2022	----	----		05-Oct-2022	28 days	3 days	✔	
Anions and Nutrients : Sulfate in Water by IC											
HDPE Pond C	E235.SO4	03-Oct-2022	05-Oct-2022	----	----		05-Oct-2022	28 days	3 days	✔	
Anions and Nutrients : Total Dissolved Phosphorus by Colourimetry (0.001 mg/L)											
Amber glass dissolved (sulfuric acid) Pond B	E375-U	03-Oct-2022	10-Oct-2022	----	----		14-Oct-2022	28 days	12 days	✔	
Anions and Nutrients : Total Dissolved Phosphorus by Colourimetry (0.001 mg/L)											
Amber glass dissolved (sulfuric acid) Pond C	E375-U	03-Oct-2022	10-Oct-2022	----	----		14-Oct-2022	28 days	12 days	✔	
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)											
Amber glass total (sulfuric acid) Pond B	E318	03-Oct-2022	19-Oct-2022	----	----		20-Oct-2022	28 days	18 days	✔	
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)											
Amber glass total (sulfuric acid) Pond C	E318	03-Oct-2022	19-Oct-2022	----	----		20-Oct-2022	28 days	18 days	✔	
Anions and Nutrients : Total Phosphorus by Colourimetry (0.001 mg/L)											
Amber glass total (sulfuric acid) Pond B	E372-S	03-Oct-2022	10-Oct-2022	----	----		13-Oct-2022	28 days	11 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 (0.001 mg/L)										
Amber glass total (sulfuric acid) Pond C	E372-S	03-Oct-2022	10-Oct-2022	----	----		13-Oct-2022	28 days	11 days	✓
Bioassays : Survival/LC50 Rainbow Trout (96 hours)										
LDPE carboy Pond C	TRT-LC50-96	03-Oct-2022	----	----	----		14-Oct-2022	5 days	12 days	* EHT
Chlorinated Phenolics : Phenolics (Eastern Canada List with Nitro-Phenols) by GC-MS										
Amber glass/Teflon lined cap Pond B	E651C	03-Oct-2022	06-Oct-2022	14 days	4 days	✓	07-Oct-2022	40 days	1 days	✓
Chlorinated Phenolics : Phenolics (Eastern Canada List with Nitro-Phenols) by GC-MS										
Amber glass/Teflon lined cap Pond C	E651C	03-Oct-2022	06-Oct-2022	14 days	4 days	✓	07-Oct-2022	40 days	1 days	✓
Cyanides : WAD Cyanide										
UV inhibited HDPE - total (lab preserved) Pond B	E336	03-Oct-2022	05-Oct-2022	0.02 hrs	41 hrs	* EHT	05-Oct-2022	-21.28 hrs	0.02 hrs	* EHT
Cyanides : WAD Cyanide										
UV inhibited HDPE - total (lab preserved) Pond C	E336	03-Oct-2022	05-Oct-2022	0.02 hrs	41 hrs	* EHT	05-Oct-2022	-21.28 hrs	0.02 hrs	* EHT
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE dissolved (nitric acid) Pond B	E421	03-Oct-2022	11-Oct-2022	----	----		12-Oct-2022	180 days	10 days	✓
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE dissolved (nitric acid) Pond C	E421	03-Oct-2022	11-Oct-2022	----	----		12-Oct-2022	180 days	10 days	✓
Hydrocarbons : CCME PHC - F1 by Headspace GC-FID										
Glass vial (sodium bisulfate) Pond B	E581.F1	03-Oct-2022	19-Oct-2022	----	----		19-Oct-2022	14 days	17 days	* EHT



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	
Hydrocarbons : CCME PHC - F1 by Headspace GC-FID										
Glass vial (sodium bisulfate) Pond C	E581.F1	03-Oct-2022	19-Oct-2022	----	----		19-Oct-2022	14 days	17 days	* EHT
Hydrocarbons : CCME PHCs - F2-F4 by GC-FID										
Amber glass/Teflon lined cap (sodium bisulfate) Pond B	E601	03-Oct-2022	19-Oct-2022	14 days	17 days	* EHT	19-Oct-2022	40 days	0 days	✓
Hydrocarbons : CCME PHCs - F2-F4 by GC-FID										
Amber glass/Teflon lined cap (sodium bisulfate) Pond C	E601	03-Oct-2022	19-Oct-2022	14 days	17 days	* EHT	19-Oct-2022	40 days	0 days	✓
Non-Chlorinated Phenolics : Phenolics (Eastern Canada List with Nitro-Phenols) by GC-MS										
Amber glass/Teflon lined cap Pond B	E651C	03-Oct-2022	06-Oct-2022	----	----		07-Oct-2022	----	----	
Non-Chlorinated Phenolics : Phenolics (Eastern Canada List with Nitro-Phenols) by GC-MS										
Amber glass/Teflon lined cap Pond C	E651C	03-Oct-2022	06-Oct-2022	----	----		07-Oct-2022	----	----	
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass dissolved (sulfuric acid) Pond B	E358-L	03-Oct-2022	07-Oct-2022	----	----		07-Oct-2022	28 days	5 days	✓
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass dissolved (sulfuric acid) Pond C	E358-L	03-Oct-2022	07-Oct-2022	----	----		07-Oct-2022	28 days	5 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE Pond B	E290	03-Oct-2022	05-Oct-2022	----	----		05-Oct-2022	14 days	3 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE Pond C	E290	03-Oct-2022	05-Oct-2022	----	----		05-Oct-2022	14 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		
Physical Tests : Conductivity in Water											
HDPE Pond B	E100	03-Oct-2022	05-Oct-2022	----	----		05-Oct-2022	28 days	3 days	✓	
Physical Tests : Conductivity in Water											
HDPE Pond C	E100	03-Oct-2022	05-Oct-2022	----	----		05-Oct-2022	28 days	3 days	✓	
Physical Tests : pH by Meter											
HDPE Pond B	E108	03-Oct-2022	05-Oct-2022	----	----		05-Oct-2022	0.25 hrs	0.48 hrs	* EHTR-FM	
Physical Tests : pH by Meter											
HDPE Pond C	E108	03-Oct-2022	05-Oct-2022	----	----		05-Oct-2022	0.25 hrs	0.48 hrs	* EHTR-FM	
Physical Tests : TDS by Gravimetry											
HDPE Pond B	E162	03-Oct-2022	----	----	----		06-Oct-2022	7 days	4 days	✓	
Physical Tests : TDS by Gravimetry											
HDPE Pond C	E162	03-Oct-2022	----	----	----		06-Oct-2022	7 days	4 days	✓	
Physical Tests : TSS by Gravimetry											
HDPE Pond B	E160	03-Oct-2022	----	----	----		05-Oct-2022	7 days	3 days	✓	
Physical Tests : TSS by Gravimetry											
HDPE Pond C	E160	03-Oct-2022	----	----	----		05-Oct-2022	7 days	3 days	✓	
Polychlorinated Biphenyls : PCB Aroclors by GC-ECD											
Amber glass/Teflon lined cap Pond B	E685	03-Oct-2022	05-Oct-2022	----	----		06-Oct-2022	40 days	1 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		
Polychlorinated Biphenyls : PCB Aroclors by GC-ECD											
Amber glass/Teflon lined cap Pond C	E685	03-Oct-2022	05-Oct-2022	----	----		06-Oct-2022	40 days	1 days	✓	
Speciated Metals : Dissolved Hexavalent Chromium (Cr VI) by IC											
HDPE Pond B	E532A	03-Oct-2022	----	----	----		06-Oct-2022	0 hrs	84 hrs	* EHT	
Speciated Metals : Dissolved Hexavalent Chromium (Cr VI) by IC											
HDPE Pond C	E532A	03-Oct-2022	----	----	----		06-Oct-2022	0 hrs	84 hrs	* EHT	
Total Metals : Total Mercury in Water by CVAAS											
Glass vial total (hydrochloric acid) Pond B	E508	03-Oct-2022	06-Oct-2022	----	----		06-Oct-2022	28 days	3 days	✓	
Total Metals : Total Mercury in Water by CVAAS											
Glass vial total (hydrochloric acid) Pond C	E508	03-Oct-2022	06-Oct-2022	----	----		06-Oct-2022	28 days	3 days	✓	
Total Metals : Total metals in Water by CRC ICPMS											
HDPE total (nitric acid) Pond B	E420	03-Oct-2022	11-Oct-2022	----	----		12-Oct-2022	180 days	10 days	✓	
Total Metals : Total metals in Water by CRC ICPMS											
HDPE total (nitric acid) Pond C	E420	03-Oct-2022	11-Oct-2022	----	----		12-Oct-2022	180 days	10 days	✓	
Volatile Organic Compounds : BTEX by Headspace GC-MS											
Glass vial (sodium bisulfate) Pond B	E611A	03-Oct-2022	19-Oct-2022	----	----		19-Oct-2022	14 days	17 days	* EHT	
Volatile Organic Compounds : BTEX by Headspace GC-MS											
Glass vial (sodium bisulfate) Pond C	E611A	03-Oct-2022	19-Oct-2022	----	----		19-Oct-2022	14 days	17 days	* EHT	

[Legend & Qualifier Definitions](#)

Page : 11 of 19
Work Order : EO2208443 Amendment 1
Client : Clean Harbors Environmental Services, Inc.
Project : Pond B and C Oct 3



EHT: Exceeded ALS recommended hold time prior to analysis.

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	Method	QC Lot #	Count		Frequency (%)		Evaluation
			QC	Regular	Actual	Expected	
Analytical Methods							
Laboratory Duplicates (DUP)							
Ammonia by Fluorescence	E298	691785	1	20	5.0	5.0	✓
BTEX by Headspace GC-MS	E611A	703933	1	2	50.0	5.0	✓
CCME PHC - F1 by Headspace GC-FID	E581.F1	703934	1	2	50.0	5.0	✓
Chemical Oxygen Demand by Colourimetry (Low Level)	E559-L	689766	1	20	5.0	5.0	✓
Chloride in Water by IC	E235.Cl	682269	1	19	5.2	5.0	✓
Conductivity in Water	E100	682036	1	14	7.1	5.0	✓
Dissolved Hexavalent Chromium (Cr VI) by IC	E532A	683703	1	18	5.5	5.0	✓
Dissolved Metals in Water by CRC ICPMS	E421	689921	1	20	5.0	5.0	✓
Dissolved Organic Carbon by Combustion (Low Level)	E358-L	686272	1	20	5.0	5.0	✓
Fluoride in Water by IC	E235.F	682273	1	19	5.2	5.0	✓
Nitrate in Water by IC	E235.NO3	682271	1	19	5.2	5.0	✓
Nitrite in Water by IC	E235.NO2	682272	1	19	5.2	5.0	✓
pH by Meter	E108	682037	1	13	7.6	5.0	✓
Phenols (4AAP) in Water by Colorimetry	E562	687934	1	20	5.0	5.0	✓
Sulfate in Water by IC	E235.SO4	682270	1	20	5.0	5.0	✓
TDS by Gravimetry	E162	683794	1	20	5.0	5.0	✓
Total Dissolved Phosphorus by Colourimetry (0.001 mg/L)	E375-U	688347	1	14	7.1	5.0	✓
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318	702163	1	20	5.0	5.0	✓
Total Mercury in Water by CVAAS	E508	683187	1	20	5.0	5.0	✓
Total metals in Water by CRC ICPMS	E420	689839	1	5	20.0	5.0	✓
Total Phosphorus by Colourimetry (0.001 mg/L)	E372-S	688839	1	20	5.0	5.0	✓
TSS by Gravimetry	E160	681561	1	20	5.0	5.0	✓
WAD Cyanide	E336	681970	1	7	14.2	5.0	✓
Laboratory Control Samples (LCS)							
Ammonia by Fluorescence	E298	691785	1	20	5.0	5.0	✓
BTEX by Headspace GC-MS	E611A	703933	1	2	50.0	5.0	✓
CCME PHC - F1 by Headspace GC-FID	E581.F1	703934	1	2	50.0	5.0	✓
CCME PHCs - F2-F4 by GC-FID	E601	703963	1	20	5.0	5.0	✓
Chemical Oxygen Demand by Colourimetry (Low Level)	E559-L	689766	1	20	5.0	5.0	✓
Chloride in Water by IC	E235.Cl	682269	1	19	5.2	5.0	✓
Conductivity in Water	E100	682036	1	14	7.1	5.0	✓
Dissolved Hexavalent Chromium (Cr VI) by IC	E532A	683703	1	18	5.5	5.0	✓
Dissolved Metals in Water by CRC ICPMS	E421	689921	1	20	5.0	5.0	✓
Dissolved Organic Carbon by Combustion (Low Level)	E358-L	686272	1	20	5.0	5.0	✓
Fluoride in Water by IC	E235.F	682273	1	19	5.2	5.0	✓
Nitrate in Water by IC	E235.NO3	682271	1	19	5.2	5.0	✓



Matrix: **Water** Evaluation: * = QC frequency outside specification; ✓ = QC frequency within specification.

Quality Control Sample Type	Method	QC Lot #	Count		Frequency (%)		
			QC	Regular	Actual	Expected	Evaluation
<i>Analytical Methods</i>							
Laboratory Control Samples (LCS) - Continued							
Nitrite in Water by IC	E235.NO2	682272	1	19	5.2	5.0	✓
PCB Aroclors by GC-ECD	E685	682338	1	3	33.3	5.0	✓
pH by Meter	E108	682037	1	13	7.6	5.0	✓
Phenolics (Eastern Canada List with Nitro-Phenols) by GC-MS	E651C	683686	1	3	33.3	5.0	✓
Phenols (4AAP) in Water by Colorimetry	E562	687934	1	20	5.0	5.0	✓
Sulfate in Water by IC	E235.SO4	682270	1	20	5.0	5.0	✓
TDS by Gravimetry	E162	683794	1	20	5.0	5.0	✓
Total Dissolved Phosphorus by Colourimetry (0.001 mg/L)	E375-U	688347	1	14	7.1	5.0	✓
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318	702163	1	20	5.0	5.0	✓
Total Mercury in Water by CVAAS	E508	683187	1	20	5.0	5.0	✓
Total metals in Water by CRC ICPMS	E420	689839	1	5	20.0	5.0	✓
Total Phosphorus by Colourimetry (0.001 mg/L)	E372-S	688839	1	20	5.0	5.0	✓
TSS by Gravimetry	E160	681561	1	20	5.0	5.0	✓
WAD Cyanide	E336	681970	1	7	14.2	5.0	✓
Method Blanks (MB)							
Ammonia by Fluorescence	E298	691785	1	20	5.0	5.0	✓
BTEX by Headspace GC-MS	E611A	703933	1	2	50.0	5.0	✓
CCME PHC - F1 by Headspace GC-FID	E581.F1	703934	1	2	50.0	5.0	✓
CCME PHCs - F2-F4 by GC-FID	E601	703963	1	20	5.0	5.0	✓
Chemical Oxygen Demand by Colourimetry (Low Level)	E559-L	689766	1	20	5.0	5.0	✓
Chloride in Water by IC	E235.Cl	682269	1	19	5.2	5.0	✓
Conductivity in Water	E100	682036	1	14	7.1	5.0	✓
Dissolved Hexavalent Chromium (Cr VI) by IC	E532A	683703	1	18	5.5	5.0	✓
Dissolved Metals in Water by CRC ICPMS	E421	689921	1	20	5.0	5.0	✓
Dissolved Organic Carbon by Combustion (Low Level)	E358-L	686272	1	20	5.0	5.0	✓
Fluoride in Water by IC	E235.F	682273	1	19	5.2	5.0	✓
Nitrate in Water by IC	E235.NO3	682271	1	19	5.2	5.0	✓
Nitrite in Water by IC	E235.NO2	682272	1	19	5.2	5.0	✓
PCB Aroclors by GC-ECD	E685	682338	1	3	33.3	5.0	✓
Phenolics (Eastern Canada List with Nitro-Phenols) by GC-MS	E651C	683686	1	3	33.3	5.0	✓
Phenols (4AAP) in Water by Colorimetry	E562	687934	1	20	5.0	5.0	✓
Sulfate in Water by IC	E235.SO4	682270	1	20	5.0	5.0	✓
TDS by Gravimetry	E162	683794	1	20	5.0	5.0	✓
Total Dissolved Phosphorus by Colourimetry (0.001 mg/L)	E375-U	688347	1	14	7.1	5.0	✓
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318	702163	1	20	5.0	5.0	✓
Total Mercury in Water by CVAAS	E508	683187	1	20	5.0	5.0	✓
Total metals in Water by CRC ICPMS	E420	689839	1	5	20.0	5.0	✓
Total Phosphorus by Colourimetry (0.001 mg/L)	E372-S	688839	1	20	5.0	5.0	✓
TSS by Gravimetry	E160	681561	1	20	5.0	5.0	✓



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

Quality Control Sample Type	Method	QC Lot #	Count		Frequency (%)		
			QC	Regular	Actual	Expected	Evaluation
<i>Analytical Methods</i>							
Method Blanks (MB) - Continued							
WAD Cyanide	E336	681970	1	7	14.2	5.0	✔
Matrix Spikes (MS)							
Ammonia by Fluorescence	E298	691785	1	20	5.0	5.0	✔
BTEX by Headspace GC-MS	E611A	703933	1	2	50.0	5.0	✔
Chemical Oxygen Demand by Colourimetry (Low Level)	E559-L	689766	1	20	5.0	5.0	✔
Chloride in Water by IC	E235.Cl	682269	1	19	5.2	5.0	✔
Dissolved Hexavalent Chromium (Cr VI) by IC	E532A	683703	1	18	5.5	5.0	✔
Dissolved Metals in Water by CRC ICPMS	E421	689921	1	20	5.0	5.0	✔
Dissolved Organic Carbon by Combustion (Low Level)	E358-L	686272	1	20	5.0	5.0	✔
Fluoride in Water by IC	E235.F	682273	1	19	5.2	5.0	✔
Nitrate in Water by IC	E235.NO3	682271	1	19	5.2	5.0	✔
Nitrite in Water by IC	E235.NO2	682272	1	19	5.2	5.0	✔
Phenols (4AAP) in Water by Colorimetry	E562	687934	1	20	5.0	5.0	✔
Sulfate in Water by IC	E235.SO4	682270	1	20	5.0	5.0	✔
Total Dissolved Phosphorus by Colourimetry (0.001 mg/L)	E375-U	688347	1	14	7.1	5.0	✔
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318	702163	1	20	5.0	5.0	✔
Total Mercury in Water by CVAAS	E508	683187	1	20	5.0	5.0	✔
Total metals in Water by CRC ICPMS	E420	689839	1	5	20.0	5.0	✔
Total Phosphorus by Colourimetry (0.001 mg/L)	E372-S	688839	1	20	5.0	5.0	✔
WAD Cyanide	E336	681970	1	7	14.2	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
Adsorbable Organic Halides (AOX) by Adsorption and Coulometric Titration	AOX Kelso - Environmental - 1317 South 13th Avenue Kelso Washington DC (District of Columbia) United States 98626	Water	EPA 1650C	Organic halide in water is determined by adsorption onto granular activated carbon (GAC), washing the adsorbed sample and GAC to remove inorganic halide, combustion of the sample and GAC to form the hydrogen halide, and titration of the hydrogen halide with a micro-coulometer.
Conductivity in Water	E100 Edmonton - Environmental	Water	APHA 2510 (mod)	Conductivity, also known as Electrical Conductivity (EC) or Specific Conductance, is measured by immersion of a conductivity cell with platinum electrodes into a water sample. Conductivity measurements are temperature-compensated to 25°C.
pH by Meter	E108 Edmonton - Environmental	Water	APHA 4500-H (mod)	pH is determined by potentiometric measurement with a pH electrode, and is conducted at ambient laboratory temperature (normally 20 ± 5°C). For high accuracy test results, pH should be measured in the field within the recommended 15 minute hold time.
TSS by Gravimetry	E160 Edmonton - Environmental	Water	APHA 2540 D (mod)	Total Suspended Solids (TSS) are determined by filtering a sample through a glass fibre filter, following by drying of the filter at 104 ± 1°C, with gravimetric measurement of the filtered solids. Samples containing very high dissolved solid content (i.e. seawaters, brackish waters) may produce a positive bias by this method. Alternate analysis methods are available for these types of samples.
TDS by Gravimetry	E162 Edmonton - Environmental	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 ± 2°C for 16 hours or to constant weight, with gravimetric measurement of the residue.
Chloride in Water by IC	E235.Cl Edmonton - Environmental	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Fluoride in Water by IC	E235.F Edmonton - Environmental	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Nitrite in Water by IC	E235.NO2 Edmonton - Environmental	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.



Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Nitrate in Water by IC	E235.NO3 Edmonton - Environmental	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Sulfate in Water by IC	E235.SO4 Edmonton - Environmental	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Alkalinity Species by Titration	E290 Edmonton - Environmental	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 Edmonton - Environmental	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)
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318 Edmonton - Environmental	Water	Method Fialab 100, 2018	TKN 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).
WAD Cyanide	E336 Waterloo - Environmental	Water	APHA 4500-CN I (mod)	Weak Acid Dissociable (WAD) cyanide is determined by Continuous Flow Analyzer (CFA) with in-line distillation followed by colourmetric analysis.
Dissolved Organic Carbon by Combustion (Low Level)	E358-L Edmonton - Environmental	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 ₂ . 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 Phosphorus by Colourimetry (0.001 mg/L)	E372-S Edmonton - Environmental	Water	APHA 4500-P E (mod).	Total Phosphorus is determined colourimetrically after heated persulfate digestion of the sample.
Total Dissolved Phosphorus by Colourimetry (0.001 mg/L)	E375-U Edmonton - Environmental	Water	APHA 4500-P E (mod).	Total Dissolved Phosphorus is determined colourimetrically after filtration through a 0.45 micron filter followed by heated persulfate digestion of the sample.
Total metals in Water by CRC ICPMS	E420 Edmonton - Environmental	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.



Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Dissolved Metals in Water by CRC ICPMS	E421 Edmonton - Environmental	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.
Total Mercury in Water by CVAAS	E508 Edmonton - Environmental	Water	EPA 1631E (mod)	Water samples undergo a cold-oxidation using bromine monochloride prior to reduction with stannous chloride, and analyzed by CVAAS
Dissolved Hexavalent Chromium (Cr VI) by IC	E532A Edmonton - Environmental	Water	APHA 3500-Cr C (Ion Chromatography)	Hexavalent Chromium is measured by Ion chromatography-Post column reaction and UV detection. sample pretreatment involved field or lab filtration following by sample preservation.
Chemical Oxygen Demand by Colourimetry (Low Level)	E559-L Edmonton - Environmental	Water	APHA 5220 D (mod)	Samples are analyzed using the closed reflux colourimetric method.
Phenols (4AAP) in Water by Colorimetry	E562 Edmonton - Environmental	Water	EPA 9066	This automated method is based on the distillation of phenol and subsequent reaction of the distillate with alkaline ferricyanide (K ₃ Fe(CN) ₆) and 4-amino-antipyrine (4-AAP) to form a red complex which is measured colorimetrically.
Oil & Grease by Visible Sheen	E566 Edmonton - Environmental	Water	Alberta Energy Regulator, Drilling waste Management, Directive 050, July 2016	Use a qualitative visual observation of rainbow sheen to determine the presence or absence of oil and grease on water.
CCME PHC - F1 by Headspace GC-FID	E581.F1 Edmonton - Environmental	Water	CCME PHC in Soil - Tier 1	CCME Fraction 1 (F1) is analyzed by static headspace GC-FID. Samples are prepared in headspace vials and are heated and agitated on the headspace autosampler, causing VOCs to partition between the aqueous phase and the headspace in accordance with Henry's law.
CCME PHCs - F2-F4 by GC-FID	E601 Edmonton - Environmental	Water	CCME PHC in Soil - Tier 1	Sample extracts are analyzed by GC-FID for CCME hydrocarbon fractions (F2-F4).
BTEX by Headspace GC-MS	E611A Edmonton - Environmental	Water	EPA 8260D (mod)	Volatile Organic Compounds (VOCs) are analyzed by static headspace GC-MS. Samples are prepared in headspace vials and are heated and agitated on the headspace autosampler, causing VOCs to partition between the aqueous phase and the headspace in accordance with Henry's law.
Phenolics (Eastern Canada List with Nitro-Phenols) by GC-MS	E651C Waterloo - Environmental	Water	EPA 8270E (mod)	Phenolics are analyzed by GC-MS.
PCB Aroclors by GC-ECD	E685	Water	EPA 8082A (mod)	PCB Aroclors are analyzed by GC-ECD



Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
	Vancouver - Environmental			
Ion Balance using Dissolved Metals	EC101 Edmonton - Environmental	Water	APHA 1030E	Cation Sum, Anion Sum, and Ion Balance are calculated based on guidance from APHA Standard Methods (1030E Checking Correctness of Analysis). Dissolved species are used where available. Minor ions are included where data is present. Ion Balance cannot be calculated accurately for waters with very low electrical conductivity (EC).
TDS in Water (Calculation)	EC103 Edmonton - Environmental	Water	APHA 1030E (mod)	Total Dissolved Solids is calculated based on guidance from APHA Standard Methods (1030E Checking Correctness of Analysis). Dissolved species are used where available. Minor ions are included where data is present.
Nitrate and Nitrite (as N) (Calculation)	EC235.N+N Edmonton - Environmental	Water	EPA 300.0	Nitrate and Nitrite (as N) is a calculated parameter. Nitrate and Nitrite (as N) = Nitrite (as N) + Nitrate (as N).
F1-BTEX	EC580 Edmonton - Environmental	Water	CCME PHC in Soil - Tier 1	F1-BTEX is calculated as follows: F1-BTEX = F1 (C6-C10) minus benzene, toluene, ethylbenzene and xylenes (BTEX).
Survival/LC50 Rainbow Trout (96 hours)	TRT-LC50-96 Bureau Veritas (Edmonton) - 9331 - 48th Street Edmonton Alberta Canada T6B 2R4	Water	EPS1/RM/13	See attached report.

Preparation Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Preparation for Ammonia	EP298 Edmonton - Environmental	Water		Sample preparation for Preserved Nutrients Water Quality Analysis.
Digestion for TKN in water	EP318 Edmonton - Environmental	Water	APHA 4500-Norg D (mod)	Samples are digested at high temperature using Sulfuric Acid with Copper catalyst, which converts organic nitrogen sources to Ammonia, which is then quantified by the analytical method as TKN. This method is unsuitable for samples containing high levels of nitrate. If nitrate exceeds TKN concentration by ten times or more, results may be biased low.
Preparation for Dissolved Organic Carbon for Combustion	EP358 Edmonton - Environmental	Water	APHA 5310 B (mod)	Preparation for Dissolved Organic Carbon
Digestion for Total Phosphorus in water	EP372 Edmonton - Environmental	Water	APHA 4500-P E (mod).	Samples are heated with a persulfate digestion reagent.



<i>Preparation Methods</i>	<i>Method / Lab</i>	<i>Matrix</i>	<i>Method Reference</i>	<i>Method Descriptions</i>
Digestion for Dissolved Phosphorus in water	EP375 Edmonton - Environmental	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 Edmonton - Environmental	Water	APHA 3030B	Water samples are filtered (0.45 um), and preserved with HNO3.
VOCs Preparation for Headspace Analysis	EP581 Edmonton - Environmental	Water	EPA 5021A (mod)	Samples are prepared in headspace vials and are heated and agitated on the headspace autosampler. An aliquot of the headspace is then injected into the GC/MS-FID system.
PHCs and PAHs Hexane Extraction	EP601 Edmonton - Environmental	Water	EPA 3511 (mod)	Petroleum Hydrocarbons (PHCs) and Polycyclic Aromatic Hydrocarbons (PAHs) are extracted using a hexane liquid-liquid extraction.
Phenolics Extraction	EP651 Waterloo - Environmental	Water	EPA 3511 (mod)	Phenolics are extracted from acidic aqueous sample using DCM liquid-liquid extraction.
PCB Aroclors Extraction	EP685 Vancouver - Environmental	Water	EPA 3510C (mod)	PCBs are extracted using an organic solvent liquid-liquid extraction. The hexane extract undergoes one or more of the following clean-up procedures (if required): florisil clean-up, silica gel clean-up, sulphur clean-up and/or sulphuric acid clean-up.

QUALITY CONTROL REPORT

Work Order	: EO2208443	Page	: 1 of 17
Amendment	: 1		
Client	: Clean Harbors Environmental Services, Inc.	Laboratory	: Edmonton - Environmental
Contact	: Todd Webb	Account Manager	: Pamela Toledo
Address	: PO Box 390, 50114 Range Road 173 AB Canada T0B4A0	Address	: 9450 - 17 Avenue NW Edmonton, Alberta Canada T6N 1M9
Telephone	:	Telephone	: +1 780 413 5227
Project	: Pond B and C Oct 3	Date Samples Received	: 03-Oct-2022 15:30
PO	: 228509	Date Analysis Commenced	: 05-Oct-2022
C-O-C number	: ----	Issue Date	: 09-Nov-2022 12:36
Sampler	: TW 780 663 2513		
Site	: Table 4.3B + Table 4.3E		
Quote number	: Q82439 / Q82442		
No. of samples received	: 2		
No. of samples analysed	: 2		

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.

<i>Signatories</i>	<i>Position</i>	<i>Laboratory Department</i>
Alex Drake	Lab Analyst	Edmonton Inorganics, Edmonton, Alberta
Amanda Powell	Account Manager	Bureau Veritas (Edmonton) External Subcontracting, Edmonton, Alberta
Amanda Powell	Client Service Manager	USA - Kelso Internal Subcontracting, Kelso, Washington DC (District of Columbia)
Angeli Marzan	Lab Analyst	Edmonton Inorganics, Edmonton, Alberta
Austin Wasylshyn	Lab Analyst	Edmonton Metals, Edmonton, Alberta
Christian Murera	Lab Analyst	Edmonton Organics, Edmonton, Alberta
Dan Nguyen	Team Leader - Inorganics	Edmonton Inorganics, Edmonton, Alberta
Dan Nguyen	Team Leader - Inorganics	Edmonton Metals, Edmonton, Alberta
Daniel Nguyen	Lab Assistant	Edmonton Inorganics, Edmonton, Alberta
Janice Leung	Supervisor - Organics Instrumentation	Vancouver Organics, Burnaby, British Columbia
Jing Liu	Lab Assistant	Edmonton Inorganics, Edmonton, Alberta
Joan Wu	Lab Analyst	Edmonton Metals, Edmonton, Alberta
Jocelyn Kennedy	Department Manager - Semi-Volatile Organics	Waterloo Organics, Waterloo, Ontario
Jon Fisher	Department Manager - Inorganics	Waterloo Inorganics, Waterloo, Ontario

Muzammil Ali

Ping Yeung

Samantha Mayor

Shruti Mudliar

Sobhithan Pillay

Yan Zhang

Lab Analyst

Team Leader - Inorganics

Lab Assistant

Lab Analyst

Lab Analyst

Edmonton Inorganics, Edmonton, Alberta

Edmonton Inorganics, Edmonton, Alberta

Edmonton Inorganics, Edmonton, Alberta

Edmonton Inorganics, Edmonton, Alberta

Edmonton Inorganics, Edmonton, Alberta

Edmonton Organics, Edmonton, Alberta

Page : 3 of 17
Work Order : EO2208443 Amendment 1
Client : Clean Harbors Environmental Services, Inc.
Project : Pond B and C Oct 3



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

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



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: 681561)											
EO2208349-001	Anonymous	solids, total suspended [TSS]	----	E160	3.0	mg/L	17.2	15.4	1.8	Diff <2x LOR	----
Physical Tests (QC Lot: 682036)											
EO2208443-001	Pond B	conductivity	----	E100	1.0	µS/cm	1320	1350	1.65%	10%	----
Physical Tests (QC Lot: 682037)											
EO2208443-001	Pond B	pH	----	E108	0.10	pH units	8.54	8.53	0.117%	3%	----
Physical Tests (QC Lot: 683794)											
EO2208443-001	Pond B	solids, total dissolved [TDS]	----	E162	20	mg/L	933	907	2.83%	20%	----
Anions and Nutrients (QC Lot: 682269)											
EO2208443-002	Pond C	chloride	16887-00-6	E235.Cl	0.50	mg/L	72.8	71.5	1.79%	20%	----
Anions and Nutrients (QC Lot: 682270)											
EO2208443-002	Pond C	sulfate (as SO4)	14808-79-8	E235.SO4	0.30	mg/L	502	488	2.82%	20%	----
Anions and Nutrients (QC Lot: 682271)											
EO2208443-002	Pond C	nitrate (as N)	14797-55-8	E235.NO3	0.020	mg/L	<0.020	<0.020	0	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 682272)											
EO2208443-002	Pond C	nitrite (as N)	14797-65-0	E235.NO2	0.010	mg/L	<0.010	<0.010	0	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 682273)											
EO2208443-002	Pond C	fluoride	16984-48-8	E235.F	0.020	mg/L	0.861	0.869	0.925%	20%	----
Anions and Nutrients (QC Lot: 688347)											
EO2208132-001	Anonymous	phosphorus, total dissolved	7723-14-0	E375-U	0.0010	mg/L	0.0714	0.0714	0.00%	20%	----
Anions and Nutrients (QC Lot: 688839)											
EO2208289-007	Anonymous	phosphorus, total	7723-14-0	E372-S	0.200	mg/L	3.02	3.12	3.00%	20%	----
Anions and Nutrients (QC Lot: 691785)											
EO2208331-016	Anonymous	ammonia, total (as N)	7664-41-7	E298	0.0050	mg/L	0.0819	0.0847	3.36%	20%	----
Anions and Nutrients (QC Lot: 702163)											
EO2208368-002	Anonymous	Kjeldahl nitrogen, total [TKN]	----	E318	0.050	mg/L	0.601	0.594	1.27%	20%	----
Cyanides (QC Lot: 681970)											
TY2202315-001	Anonymous	cyanide, weak acid dissociable	----	E336	0.0020	mg/L	<0.0020	<0.0020	0	Diff <2x LOR	----
Organic / Inorganic Carbon (QC Lot: 686272)											
EO2208443-001	Pond B	carbon, dissolved organic [DOC]	----	E358-L	0.50	mg/L	18.6	19.0	2.24%	20%	----
Total Metals (QC Lot: 683187)											



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: 683187) - continued											
EO2208347-001	Anonymous	mercury, total	7439-97-6	E508	0.000050	mg/L	<0.000050	<0.000050	0	Diff <2x LOR	----
Total Metals (QC Lot: 689839)											
EO2208409-001	Anonymous	chromium, total	7440-47-3	E420	0.00050	mg/L	0.00128	0.00120	0.00008	Diff <2x LOR	----
Dissolved Metals (QC Lot: 689921)											
EO2208389-003	Anonymous	aluminum, dissolved	7429-90-5	E421	0.0010	mg/L	<0.0010	<0.0010	0	Diff <2x LOR	----
		antimony, dissolved	7440-36-0	E421	0.00010	mg/L	0.00010	<0.00010	0.000005	Diff <2x LOR	----
		arsenic, dissolved	7440-38-2	E421	0.00010	mg/L	0.00032	0.00031	0.00001	Diff <2x LOR	----
		barium, dissolved	7440-39-3	E421	0.00010	mg/L	0.0814	0.0810	0.508%	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	0.214	0.214	0.0664%	20%	----
		cadmium, dissolved	7440-43-9	E421	0.000050	mg/L	0.0000207	0.0000241	0.0000033	Diff <2x LOR	----
		calcium, dissolved	7440-70-2	E421	0.050	mg/L	126	127	0.940%	20%	----
		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	0.00014	0.00015	0.000002	Diff <2x LOR	----
		copper, dissolved	7440-50-8	E421	0.00020	mg/L	0.00300	0.00301	0.115%	20%	----
		iron, dissolved	7439-89-6	E421	0.030	mg/L	<0.030	<0.030	0	Diff <2x LOR	----
		lead, dissolved	7439-92-1	E421	0.000050	mg/L	<0.000050	<0.000050	0	Diff <2x LOR	----
		magnesium, dissolved	7439-95-4	E421	0.0050	mg/L	72.2	70.5	2.31%	20%	----
		manganese, dissolved	7439-96-5	E421	0.00500	mg/L	0.00748	0.00761	0.00012	Diff <2x LOR	----
		molybdenum, dissolved	7439-98-7	E421	0.000050	mg/L	0.000697	0.000743	6.31%	20%	----
		nickel, dissolved	7440-02-0	E421	0.00050	mg/L	0.00249	0.00238	0.00011	Diff <2x LOR	----
		potassium, dissolved	7440-09-7	E421	0.050	mg/L	2.82	2.84	0.657%	20%	----
		selenium, dissolved	7782-49-2	E421	0.000050	mg/L	0.00213	0.00210	1.26%	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	29.2	29.4	0.807%	20%	----
		strontium, dissolved	7440-24-6	E421	0.00020	mg/L	0.516	0.512	0.664%	20%	----
		thallium, dissolved	7440-28-0	E421	0.000010	mg/L	0.000033	0.000032	0.0000009	Diff <2x LOR	----
		tin, dissolved	7440-31-5	E421	0.00010	mg/L	<0.00010	<0.00010	0	Diff <2x LOR	----
		uranium, dissolved	7440-61-1	E421	0.000010	mg/L	0.0137	0.0143	4.29%	20%	----
		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	0.0016	0.0014	0.0001	Diff <2x LOR	----
		zirconium, dissolved	7440-67-7	E421	0.00020	mg/L	<0.00020	<0.00020	0	Diff <2x LOR	----
Speciated Metals (QC Lot: 683703)											



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
Speciated Metals (QC Lot: 683703) - continued											
FC2202434-001	Anonymous	chromium, hexavalent [Cr VI], dissolved	18540-29-9	E532A	0.00050	mg/L	<0.00050	<0.00050	0	Diff <2x LOR	----
Aggregate Organics (QC Lot: 687934)											
RG2201387-010	Anonymous	phenols, total (4AAP)	----	E562	0.0010	mg/L	<0.0010	<0.0010	0	Diff <2x LOR	----
Aggregate Organics (QC Lot: 689766)											
EO2208443-001	Pond B	chemical oxygen demand [COD]	----	E559-L	10	mg/L	48	50	2	Diff <2x LOR	----
Volatile Organic Compounds (QC Lot: 703933)											
EO2208443-001	Pond B	benzene	71-43-2	E611A	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		ethylbenzene	100-41-4	E611A	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		toluene	108-88-3	E611A	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		xylene, m+p-	179601-23-1	E611A	0.40	µg/L	<0.40	<0.40	0	Diff <2x LOR	----
		xylene, o-	95-47-6	E611A	0.30	µg/L	<0.30	<0.30	0	Diff <2x LOR	----
Hydrocarbons (QC Lot: 703934)											
EO2208443-001	Pond B	F1 (C6-C10)	----	E581.F1	100	µg/L	<100	<100	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: 681561)						
solids, total suspended [TSS]	---	E160	3	mg/L	<3.0	---
Physical Tests (QCLot: 682036)						
conductivity	---	E100	1	µS/cm	1.2	---
Physical Tests (QCLot: 683794)						
solids, total dissolved [TDS]	---	E162	10	mg/L	<10	---
Anions and Nutrients (QCLot: 682269)						
chloride	16887-00-6	E235.Cl	0.5	mg/L	<0.50	---
Anions and Nutrients (QCLot: 682270)						
sulfate (as SO4)	14808-79-8	E235.SO4	0.3	mg/L	<0.30	---
Anions and Nutrients (QCLot: 682271)						
nitrate (as N)	14797-55-8	E235.NO3	0.02	mg/L	<0.020	---
Anions and Nutrients (QCLot: 682272)						
nitrite (as N)	14797-65-0	E235.NO2	0.01	mg/L	<0.010	---
Anions and Nutrients (QCLot: 682273)						
fluoride	16984-48-8	E235.F	0.02	mg/L	<0.020	---
Anions and Nutrients (QCLot: 688347)						
phosphorus, total dissolved	7723-14-0	E375-U	0.001	mg/L	<0.0010	---
Anions and Nutrients (QCLot: 688839)						
phosphorus, total	7723-14-0	E372-S	0.001	mg/L	<0.0010	---
Anions and Nutrients (QCLot: 691785)						
ammonia, total (as N)	7664-41-7	E298	0.005	mg/L	<0.0050	---
Anions and Nutrients (QCLot: 702163)						
Kjeldahl nitrogen, total [TKN]	---	E318	0.05	mg/L	<0.050	---
Cyanides (QCLot: 681970)						
cyanide, weak acid dissociable	---	E336	0.002	mg/L	<0.0020	---
Organic / Inorganic Carbon (QCLot: 686272)						
carbon, dissolved organic [DOC]	---	E358-L	0.5	mg/L	<0.50	---
Total Metals (QCLot: 683187)						
mercury, total	7439-97-6	E508	0.000005	mg/L	<0.0000050	---
Total Metals (QCLot: 689839)						
chromium, total	7440-47-3	E420	0.0005	mg/L	<0.00050	---
Dissolved Metals (QCLot: 689921)						



Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Dissolved Metals (QCLot: 689921) - continued						
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	----
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	----
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	----
potassium, dissolved	7440-09-7	E421	0.05	mg/L	<0.050	----
selenium, dissolved	7782-49-2	E421	0.00005	mg/L	<0.000050	----
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	----
thallium, dissolved	7440-28-0	E421	0.00001	mg/L	<0.000010	----
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	----
Speciated Metals (QCLot: 683703)						
chromium, hexavalent [Cr VI], dissolved	18540-29-9	E532A	0.0005	mg/L	<0.00050	----
Aggregate Organics (QCLot: 687934)						
phenols, total (4AAP)	----	E562	0.001	mg/L	<0.0010	----
Aggregate Organics (QCLot: 689766)						
chemical oxygen demand [COD]	----	E559-L	10	mg/L	<10	----
Volatile Organic Compounds (QCLot: 703933)						



Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Volatile Organic Compounds (QCLot: 703933) - continued						
benzene	71-43-2	E611A	0.5	µg/L	<0.50	----
ethylbenzene	100-41-4	E611A	0.5	µg/L	<0.50	----
toluene	108-88-3	E611A	0.5	µg/L	<0.50	----
xylene, m+p-	179601-23-1	E611A	0.4	µg/L	<0.40	----
xylene, o-	95-47-6	E611A	0.3	µg/L	<0.30	----
Hydrocarbons (QCLot: 703934)						
F1 (C6-C10)	----	E581.F1	100	µg/L	<100	----
Hydrocarbons (QCLot: 703963)						
F2 (C10-C16)	----	E601	100	µg/L	<100	----
Chlorinated Phenolics (QCLot: 683686)						
chlorophenol, 2-	95-57-8	E651C	0.3	µg/L	<0.30	----
dichlorophenol, 2,4-	120-83-2	E651C	0.2	µg/L	<0.20	----
dichlorophenol, 2,6-	87-65-0	E651C	0.2	µg/L	<0.20	----
methylphenol, 4-chloro-3-	59-50-7	E651C	0.5	µg/L	<0.50	----
pentachlorophenol [PCP]	87-86-5	E651C	0.5	µg/L	<0.50	----
tetrachlorophenol, 2,3,4,5-	4901-51-3	E651C	0.5	µg/L	<0.50	----
tetrachlorophenol, 2,3,4,6-	58-90-2	E651C	0.5	µg/L	<0.50	----
tetrachlorophenol, 2,3,5,6-	935-95-5	E651C	0.5	µg/L	<0.50	----
trichlorophenol, 2,3,4-	15950-66-0	E651C	0.5	µg/L	<0.50	----
trichlorophenol, 2,3,5-	933-78-8	E651C	0.5	µg/L	<0.50	----
trichlorophenol, 2,4,5-	95-95-4	E651C	0.5	µg/L	<0.50	----
trichlorophenol, 2,4,6-	88-06-2	E651C	0.5	µg/L	<0.50	----
Non-Chlorinated Phenolics (QCLot: 683686)						
dimethylphenol, 2,4-	105-67-9	E651C	0.5	µg/L	<0.50	----
dinitrophenol, 2,4-	51-28-5	E651C	1	µg/L	<1.0	----
methylphenol, 2-	95-48-7	E651C	0.5	µg/L	<0.50	----
methylphenol, 3+4-	----	E651C	0.5	µg/L	<0.50	----
nitrophenol, 2-	88-75-5	E651C	0.5	µg/L	<0.50	----
nitrophenol, 4-	100-02-7	E651C	0.5	µg/L	<0.50	----
phenol	108-95-2	E651C	0.5	µg/L	<0.50	----
phenol, 2-methyl-4,6-dinitro- [DNOC]	534-52-1	E651C	2	µg/L	<2.0	----
Polychlorinated Biphenyls (QCLot: 682338)						
Aroclor 1016	12674-11-2	E685	1	µg/L	<1.0	----
Aroclor 1221	11104-28-2	E685	1	µg/L	<1.0	----
Aroclor 1232	11141-16-5	E685	1	µg/L	<1.0	----

Page : 10 of 17
Work Order : EO2208443 Amendment 1
Client : Clean Harbors Environmental Services, Inc.
Project : Pond B and C Oct 3



Sub-Matrix: **Water**

<i>Analyte</i>	<i>CAS Number</i>	<i>Method</i>	<i>LOR</i>	<i>Unit</i>	<i>Result</i>	<i>Qualifier</i>
Polychlorinated Biphenyls (QCLot: 682338) - continued						
Aroclor 1242	53469-21-9	E685	1	µg/L	<1.0	----
Aroclor 1248	12672-29-6	E685	1	µg/L	<1.0	----
Aroclor 1254	11097-69-1	E685	1	µg/L	<1.0	----
Aroclor 1260	11096-82-5	E685	1	µg/L	<1.0	----
Aroclor 1262	37324-23-5	E685	1	µg/L	<1.0	----
Aroclor 1268	11100-14-4	E685	1	µg/L	<1.0	----



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				
Analyte	CAS Number	Method	LOR	Unit	Spike	Recovery (%)	Recovery Limits (%)		Qualifier
					Concentration	LCS	Low	High	
Physical Tests (QCLot: 681561)									
solids, total suspended [TSS]	----	E160	3	mg/L	150 mg/L	105	85.0	115	----
Physical Tests (QCLot: 682036)									
conductivity	----	E100	1	µS/cm	1412 µS/cm	101	90.0	110	----
Physical Tests (QCLot: 682037)									
pH	----	E108	----	pH units	6 pH units	102	97.0	103	----
Physical Tests (QCLot: 683794)									
solids, total dissolved [TDS]	----	E162	10	mg/L	1000 mg/L	105	85.0	115	----
Anions and Nutrients (QCLot: 682269)									
chloride	16887-00-6	E235.Cl	0.5	mg/L	100 mg/L	98.4	90.0	110	----
Anions and Nutrients (QCLot: 682270)									
sulfate (as SO4)	14808-79-8	E235.SO4	0.3	mg/L	100 mg/L	100	90.0	110	----
Anions and Nutrients (QCLot: 682271)									
nitrate (as N)	14797-55-8	E235.NO3	0.02	mg/L	2.5 mg/L	101	90.0	110	----
Anions and Nutrients (QCLot: 682272)									
nitrite (as N)	14797-65-0	E235.NO2	0.01	mg/L	0.5 mg/L	97.0	90.0	110	----
Anions and Nutrients (QCLot: 682273)									
fluoride	16984-48-8	E235.F	0.02	mg/L	1 mg/L	101	90.0	110	----
Anions and Nutrients (QCLot: 688347)									
phosphorus, total dissolved	7723-14-0	E375-U	0.001	mg/L	0.05 mg/L	97.4	80.0	120	----
Anions and Nutrients (QCLot: 688839)									
phosphorus, total	7723-14-0	E372-S	0.001	mg/L	0.05 mg/L	112	80.0	120	----
Anions and Nutrients (QCLot: 691785)									
ammonia, total (as N)	7664-41-7	E298	0.005	mg/L	0.2 mg/L	106	85.0	115	----
Anions and Nutrients (QCLot: 702163)									
Kjeldahl nitrogen, total [TKN]	----	E318	0.05	mg/L	4 mg/L	100	75.0	125	----
Cyanides (QCLot: 681970)									
cyanide, weak acid dissociable	----	E336	0.002	mg/L	0.125 mg/L	104	80.0	120	----
Organic / Inorganic Carbon (QCLot: 686272)									
carbon, dissolved organic [DOC]	----	E358-L	0.5	mg/L	8.57 mg/L	110	80.0	120	----



Sub-Matrix: Water					Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		Qualifier
Analyte	CAS Number	Method	LOR	Unit	Concentration	LCS	Low	High	
Total Metals (QCLot: 683187)									
mercury, total	7439-97-6	E508	0.000005	mg/L	0.0001 mg/L	96.8	80.0	120	----
Total Metals (QCLot: 689839)									
chromium, total	7440-47-3	E420	0.0005	mg/L	0.25 mg/L	98.1	80.0	120	----
Dissolved Metals (QCLot: 689921)									
aluminum, dissolved	7429-90-5	E421	0.001	mg/L	2 mg/L	103	80.0	120	----
antimony, dissolved	7440-36-0	E421	0.0001	mg/L	1 mg/L	100	80.0	120	----
arsenic, dissolved	7440-38-2	E421	0.0001	mg/L	1 mg/L	97.1	80.0	120	----
barium, dissolved	7440-39-3	E421	0.0001	mg/L	0.25 mg/L	96.4	80.0	120	----
beryllium, dissolved	7440-41-7	E421	0.00002	mg/L	0.1 mg/L	95.8	80.0	120	----
bismuth, dissolved	7440-69-9	E421	0.00005	mg/L	1 mg/L	93.9	80.0	120	----
boron, dissolved	7440-42-8	E421	0.01	mg/L	1 mg/L	113	80.0	120	----
cadmium, dissolved	7440-43-9	E421	0.000005	mg/L	0.1 mg/L	97.6	80.0	120	----
calcium, dissolved	7440-70-2	E421	0.05	mg/L	50 mg/L	101	80.0	120	----
chromium, dissolved	7440-47-3	E421	0.0005	mg/L	0.25 mg/L	96.0	80.0	120	----
cobalt, dissolved	7440-48-4	E421	0.0001	mg/L	0.25 mg/L	95.6	80.0	120	----
copper, dissolved	7440-50-8	E421	0.0002	mg/L	0.25 mg/L	96.9	80.0	120	----
iron, dissolved	7439-89-6	E421	0.01	mg/L	1 mg/L	111	80.0	120	----
lead, dissolved	7439-92-1	E421	0.00005	mg/L	0.5 mg/L	101	80.0	120	----
magnesium, dissolved	7439-95-4	E421	0.005	mg/L	50 mg/L	94.9	80.0	120	----
manganese, dissolved	7439-96-5	E421	0.0001	mg/L	0.25 mg/L	98.8	80.0	120	----
molybdenum, dissolved	7439-98-7	E421	0.00005	mg/L	0.25 mg/L	98.5	80.0	120	----
nickel, dissolved	7440-02-0	E421	0.0005	mg/L	0.5 mg/L	96.3	80.0	120	----
potassium, dissolved	7440-09-7	E421	0.05	mg/L	50 mg/L	105	80.0	120	----
selenium, dissolved	7782-49-2	E421	0.00005	mg/L	1 mg/L	98.2	80.0	120	----
silver, dissolved	7440-22-4	E421	0.00001	mg/L	0.1 mg/L	100	80.0	120	----
sodium, dissolved	7440-23-5	E421	0.05	mg/L	50 mg/L	101	80.0	120	----
strontium, dissolved	7440-24-6	E421	0.0002	mg/L	0.25 mg/L	105	80.0	120	----
thallium, dissolved	7440-28-0	E421	0.00001	mg/L	1 mg/L	97.3	80.0	120	----
tin, dissolved	7440-31-5	E421	---	mg/L	0.5 mg/L	97.7	80.0	120	----
uranium, dissolved	7440-61-1	E421	0.00001	mg/L	0.005 mg/L	109	80.0	120	----
vanadium, dissolved	7440-62-2	E421	0.0005	mg/L	0.5 mg/L	98.4	80.0	120	----
zinc, dissolved	7440-66-6	E421	0.001	mg/L	0.5 mg/L	92.9	80.0	120	----
zirconium, dissolved	7440-67-7	E421	0.0002	mg/L	0.1 mg/L	97.8	80.0	120	----



Sub-Matrix: **Water**

					Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
Analyte	CAS Number	Method	LOR	Unit	Concentration	LCS	Low	High	Qualifier
Speciated Metals (QCLot: 683703)									
chromium, hexavalent [Cr VI], dissolved	18540-29-9	E532A	0.0005	mg/L	0.25 mg/L	100	80.0	120	----
Aggregate Organics (QCLot: 687934)									
phenols, total (4AAP)	----	E562	0.001	mg/L	0.02 mg/L	95.5	85.0	115	----
Aggregate Organics (QCLot: 689766)									
chemical oxygen demand [COD]	----	E559-L	10	mg/L	100 mg/L	103	85.0	115	----
Volatile Organic Compounds (QCLot: 703933)									
benzene	71-43-2	E611A	0.5	µg/L	100 µg/L	100	70.0	130	----
ethylbenzene	100-41-4	E611A	0.5	µg/L	100 µg/L	100	70.0	130	----
toluene	108-88-3	E611A	0.5	µg/L	100 µg/L	94.3	70.0	130	----
xylene, m+p-	179601-23-1	E611A	0.4	µg/L	200 µg/L	108	70.0	130	----
xylene, o-	95-47-6	E611A	0.3	µg/L	100 µg/L	110	70.0	130	----
Hydrocarbons (QCLot: 703934)									
F1 (C6-C10)	----	E581.F1	100	µg/L	2750 µg/L	101	70.0	130	----
Hydrocarbons (QCLot: 703963)									
F2 (C10-C16)	----	E601	100	µg/L	3850 µg/L	110	70.0	130	----
Chlorinated Phenolics (QCLot: 683686)									
chlorophenol, 2-	95-57-8	E651C	0.3	µg/L	4.8 µg/L	92.6	50.0	130	----
dichlorophenol, 2,4-	120-83-2	E651C	0.2	µg/L	4.8 µg/L	101	50.0	130	----
dichlorophenol, 2,6-	87-65-0	E651C	0.2	µg/L	4.8 µg/L	101	50.0	130	----
methylphenol, 4-chloro-3-	59-50-7	E651C	0.5	µg/L	4.8 µg/L	102	60.0	130	----
pentachlorophenol [PCP]	87-86-5	E651C	0.5	µg/L	4.8 µg/L	130	40.0	140	----
tetrachlorophenol, 2,3,4,5-	4901-51-3	E651C	0.5	µg/L	4.8 µg/L	105	60.0	130	----
tetrachlorophenol, 2,3,4,6-	58-90-2	E651C	0.5	µg/L	4.8 µg/L	102	60.0	130	----
tetrachlorophenol, 2,3,5,6-	935-95-5	E651C	0.5	µg/L	4.8 µg/L	108	60.0	130	----
trichlorophenol, 2,3,4-	15950-66-0	E651C	0.5	µg/L	4.8 µg/L	110	50.0	130	----
trichlorophenol, 2,3,5-	933-78-8	E651C	0.5	µg/L	4.8 µg/L	109	50.0	130	----
trichlorophenol, 2,4,5-	95-95-4	E651C	0.5	µg/L	4.8 µg/L	112	50.0	130	----
trichlorophenol, 2,4,6-	88-06-2	E651C	0.5	µg/L	4.8 µg/L	108	50.0	130	----
Non-Chlorinated Phenolics (QCLot: 683686)									
dimethylphenol, 2,4-	105-67-9	E651C	0.5	µg/L	4.8 µg/L	105	50.0	130	----
dinitrophenol, 2,4-	51-28-5	E651C	1	µg/L	4.8 µg/L	# 144	40.0	130	LCS-H
methylphenol, 2-	95-48-7	E651C	0.5	µg/L	4.8 µg/L	89.4	30.0	130	----



Sub-Matrix: **Water**

					Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
Analyte	CAS Number	Method	LOR	Unit	Concentration	LCS	Low	High	Qualifier
Non-Chlorinated Phenolics (QCLot: 683686) - continued									
methylphenol, 3+4-	----	E651C	0.5	µg/L	9.6 µg/L	88.9	50.0	130	----
nitrophenol, 2-	88-75-5	E651C	0.5	µg/L	1.6 µg/L	99.2	40.0	140	----
nitrophenol, 4-	100-02-7	E651C	0.5	µg/L	4.8 µg/L	79.8	40.0	140	----
phenol	108-95-2	E651C	0.5	µg/L	4.8 µg/L	113	30.0	130	----
phenol, 2-methyl-4,6-dinitro- [DNOC]	534-52-1	E651C	2	µg/L	4.8 µg/L	# 149	40.0	140	LCS-H
Polychlorinated Biphenyls (QCLot: 682338)									
Aroclor 1260	11096-82-5	E685	1	µg/L	5 µg/L	104	65.0	130	----

Qualifiers

Qualifier	Description
LCS-H	Lab Control Sample recovery was above ALS DQO. Non-detected sample results are considered reliable. Other results, if reported, have been qualified.



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.

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
Anions and Nutrients (QCLot: 682269)										
EO2208443-002	Pond C	chloride	16887-00-6	E235.Cl	98.5 mg/L	100 mg/L	98.5	75.0	125	----
Anions and Nutrients (QCLot: 682270)										
EO2208443-002	Pond C	sulfate (as SO4)	14808-79-8	E235.SO4	ND mg/L	100 mg/L	ND	75.0	125	----
Anions and Nutrients (QCLot: 682271)										
EO2208443-002	Pond C	nitrate (as N)	14797-55-8	E235.NO3	2.74 mg/L	2.5 mg/L	110	75.0	125	----
Anions and Nutrients (QCLot: 682272)										
EO2208443-002	Pond C	nitrite (as N)	14797-65-0	E235.NO2	0.528 mg/L	0.5 mg/L	106	75.0	125	----
Anions and Nutrients (QCLot: 682273)										
EO2208443-002	Pond C	fluoride	16984-48-8	E235.F	1.03 mg/L	1 mg/L	103	75.0	125	----
Anions and Nutrients (QCLot: 688347)										
EO2208144-001	Anonymous	phosphorus, total dissolved	7723-14-0	E375-U	0.0698 mg/L	0.067 mg/L	104	70.0	130	----
Anions and Nutrients (QCLot: 688839)										
EO2208289-008	Anonymous	phosphorus, total	7723-14-0	E372-S	0.0676 mg/L	0.067 mg/L	101	70.0	130	----
Anions and Nutrients (QCLot: 691785)										
EO2208331-016	Anonymous	ammonia, total (as N)	7664-41-7	E298	0.121 mg/L	0.1 mg/L	121	75.0	125	----
Anions and Nutrients (QCLot: 702163)										
EO2208368-003	Anonymous	Kjeldahl nitrogen, total [TKN]	----	E318	2.58 mg/L	2.5 mg/L	103	70.0	130	----
Cyanides (QCLot: 681970)										
TY2202315-001	Anonymous	cyanide, weak acid dissociable	----	E336	0.133 mg/L	0.125 mg/L	106	75.0	125	----
Organic / Inorganic Carbon (QCLot: 686272)										
EO2208443-002	Pond C	carbon, dissolved organic [DOC]	----	E358-L	ND mg/L	5 mg/L	ND	70.0	130	----
Total Metals (QCLot: 683187)										
EO2208347-002	Anonymous	mercury, total	7439-97-6	E508	0.0000971 mg/L	0.0001 mg/L	97.1	70.0	130	----
Total Metals (QCLot: 689839)										
EO2208412-001	Anonymous	chromium, total	7440-47-3	E420	0.0395 mg/L	0.04 mg/L	98.7	70.0	130	----
Dissolved Metals (QCLot: 689921)										
EO2208389-004	Anonymous	aluminum, dissolved	7429-90-5	E421	0.224 mg/L	0.2 mg/L	112	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: 689921) - continued										
EO2208389-004	Anonymous	antimony, dissolved	7440-36-0	E421	0.0208 mg/L	0.02 mg/L	104	70.0	130	----
		arsenic, dissolved	7440-38-2	E421	0.0209 mg/L	0.02 mg/L	104	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	0.0450 mg/L	0.04 mg/L	112	70.0	130	----
		bismuth, dissolved	7440-69-9	E421	0.00943 mg/L	0.01 mg/L	94.3	70.0	130	----
		boron, dissolved	7440-42-8	E421	ND mg/L	0.1 mg/L	ND	70.0	130	----
		cadmium, dissolved	7440-43-9	E421	0.00382 mg/L	0.004 mg/L	95.6	70.0	130	----
		calcium, dissolved	7440-70-2	E421	ND mg/L	4 mg/L	ND	70.0	130	----
		chromium, dissolved	7440-47-3	E421	0.0401 mg/L	0.04 mg/L	100	70.0	130	----
		cobalt, dissolved	7440-48-4	E421	ND mg/L	0.02 mg/L	ND	70.0	130	----
		copper, dissolved	7440-50-8	E421	0.0199 mg/L	0.02 mg/L	99.4	70.0	130	----
		iron, dissolved	7439-89-6	E421	2.20 mg/L	2 mg/L	110	70.0	130	----
		lead, dissolved	7439-92-1	E421	0.0180 mg/L	0.02 mg/L	89.8	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	ND mg/L	0.02 mg/L	ND	70.0	130	----
		molybdenum, dissolved	7439-98-7	E421	0.0196 mg/L	0.02 mg/L	98.2	70.0	130	----
		nickel, dissolved	7440-02-0	E421	ND mg/L	0.04 mg/L	ND	70.0	130	----
		potassium, dissolved	7440-09-7	E421	ND mg/L	4 mg/L	ND	70.0	130	----
		selenium, dissolved	7782-49-2	E421	0.0386 mg/L	0.04 mg/L	96.6	70.0	130	----
		silver, dissolved	7440-22-4	E421	0.00397 mg/L	0.004 mg/L	99.2	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	----
		thallium, dissolved	7440-28-0	E421	0.00361 mg/L	0.004 mg/L	90.2	70.0	130	----
		tin, dissolved	7440-31-5	E421	0.0198 mg/L	0.02 mg/L	99.1	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	0.106 mg/L	0.1 mg/L	106	70.0	130	----
		zinc, dissolved	7440-66-6	E421	0.369 mg/L	0.4 mg/L	92.3	70.0	130	----
		zirconium, dissolved	7440-67-7	E421	0.0445 mg/L	0.04 mg/L	111	70.0	130	----
Speciated Metals (QCLot: 683703)										
FC2202434-001	Anonymous	chromium, hexavalent [Cr VI], dissolved	18540-29-9	E532A	0.0487 mg/L	0.05 mg/L	97.4	70.0	130	----
Aggregate Organics (QCLot: 687934)										
RG2201387-010	Anonymous	phenols, total (4AAP)	----	E562	0.0172 mg/L	0.02 mg/L	86.2	75.0	125	----
Aggregate Organics (QCLot: 689766)										
EO2208443-002	Pond C	chemical oxygen demand [COD]	----	E559-L	98 mg/L	100 mg/L	98.3	75.0	125	----

Page : 17 of 17
 Work Order : EO2208443 Amendment 1
 Client : Clean Harbors Environmental Services, Inc.
 Project : Pond B and C Oct 3



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
Volatile Organic Compounds (QCLot: 703933)										
EO2208443-002	Pond C	benzene	71-43-2	E611A	101 µg/L	100 µg/L	101	50.0	140	----
		ethylbenzene	100-41-4	E611A	80.0 µg/L	100 µg/L	80.0	50.0	140	----
		toluene	108-88-3	E611A	84.9 µg/L	100 µg/L	84.9	50.0	140	----
		xylene, m+p-	179601-23-1	E611A	207 µg/L	200 µg/L	104	50.0	140	----
		xylene, o-	95-47-6	E611A	94.6 µg/L	100 µg/L	94.6	50.0	140	----



RESULTS OF DAPHNIA MAGNA LC50 MULTI-CONCENTRATION

BUREAU VERITAS

Client : 70036 ALS ENVIRONMENTAL, CALGARY
Client Project Name & Number: EO2208443

Job Number: C277285
Sample Number: BDO096-02

Test Result:

48 hrs LC50 % vol/vol (95% CL): >100% (N/A) Statistical Method: Visual

Sample Name : EO2208443-002 - POND C
Description: Yellow, cloudy
Sample Collected: Oct 03, 2022
Sample Collected By: N/A
Sample Received: Oct 04, 2022 05:03 PM
Analysis Start : Oct 05, 2022 01:22 PM
End : Oct 07, 2022 01:52 PM
Sampling Method : N/A
Site Collection: N/A
Volume Received: 1 L
Avg Temp Arrival: 5 °C
Storage: 2-6°C
Sample Matrix : Water
Sample Prior to Analysis:
pH: 8.0
Temperature : 20 °C
Dissolved Oxygen: 9.1 mg/L
Sample Conductance: 1267 µS/cm
Hardness: 220 mg CaCO3/L

Table with 13 columns: Concentration, Temperature (°C), pH (pH), Conductivity (uS/cm), Dissolved Oxygen (mg/L), Mortality (#), Mortality (%), Immobility (#), Immobility (%), Temperature (°C), pH (pH), Conductivity (uS/cm), Dissolved Oxygen (mg/L). Rows include % vol/vol (Start) and concentrations 0, 6.25, 12.5, 25, 50, 100.

Table with 5 columns: Concentration, Mortality (#), Mortality (%), Immobility (#), Immobility (%). Rows include % vol/vol (48 hrs) and concentrations 0, 6.25, 12.5, 25, 50, 100.

Comments : Indigenous organisms present in sample.

Culture/Control/Dilution Water: City of Edmonton dechlorinated tap water
Hardness: 180 mg/L CaCO3 Other parameters available on request.

Test Conditions
Test concentration : 0,6.25,12.5,25,50,100 (% vol/vol)
Organisms per Vessel : 10
Pre-aeration Time : 30 min
Rate of Pre-aeration : 25-50 mL/min/L
Total # of Organisms Used : 60
Test Temperature : 20 ± 2 °C
Test Hardness Adjusted : No
Test Volume : 150 mL
Vessel Volume : 200 mL
Test pH Adjusted: No
Loading Density : 15.0 mL/Daphnia
Photoperiod : 16:8 (light: dark)

Test Organism : Daphnia magna
Source : In House Culture
Age at Test Initiation : <24 hrs
Average Brood Size : 31.5
Culture Photoperiod : 16:8 (light: dark)
% Mortality within 7 days : 3.6
Culture Temperature : 20 ± 2 °C
Time To First Brood : 8 Days
Culture Diet : Pseudokirchneriella and YTC at a ratio of 2 mL/L of culture daily. New cultures weekly, 63 daphnids distributed into 6 culture vessels and 3 reproductive vessels.



RESULTS OF *DAPHNIA MAGNA* LC50 MULTI-CONCENTRATION

BUREAU
VERITAS

Client : 70036 ALS ENVIRONMENTAL, CALGARY
Client Project Name & Number: EO2208443

Job Number: C277285
Sample Number: BDO096-02

Reference chemical:	Sodium Chloride	Test Date:	Oct 04, 2022
Test Endpoint 48 hrs LC50 (95% confidence interval) :	6.96 (5.70, 8.50)g/L	Statistical Method :	Binomial
Historical Mean LC50 (warning limits) :	5.80 (4.28, 7.87) g/L	Concentration :	0,1.71,2.56,3.82,5.7,8.5 g/L

Test Method EPS 1/RM/14
Method Deviations: None

Note: The results contained in this report refer only to the testing of the sample submitted. Bureau Veritas is accredited to ISO/IEC 17025 for specific parameters on scopes of accreditation, including the toxicity parameters reported herein. The conductivity, dissolved oxygen and pH data contained within the toxicity report are provided for information purposes and are not individually accredited parameters. This report may not be reproduced, except in its entirety, without the written approval of the laboratory.

Analyst : Cara Shurgot, Kyle Monaghan, Tami Horvath

Verified By : Chelsea Tessier, Ecotoxicology Supervisor

Date: Oct 12, 2022 12:01 PM



RESULTS OF RAINBOW TROUT LC50 MULTI-CONCENTRATION

BUREAU
VERITAS

Client : 70036 ALS ENVIRONMENTAL, CALGARY

Job Number: C277285

Client Project Name & Number: EO2208443

Test Result:

96 hrs LC50 % vol/vol (95% CL): >100% (N/A) Statistical Method: Visual

Sample Name : EO2208443-002 - POND C

Sample Matrix : Water

Description: Yellow, cloudy

Sample Number: BDO096-01

Sample Collected: Oct 03, 2022

Sampling Method : N/A

Site Collection: N/A

Sample Collected By: N/A

Volume Received: 40 L

Avg Temp Arrival: 5 °C Storage: 2-6°C

Sample Received: Oct 04, 2022 05:03 PM

pH: 8.0

Dissolved Oxygen: 8.6 mg/L

Analysis Start : Oct 06, 2022 09:20 AM

Temperature : 14 °C

Sample Conductance: 1088 µS/cm

Concentration	Temperature (°C)	pH (pH)	Conductivity (uS/cm)	Dissolved Oxygen (mg/L)	Mortality (#)	Mortality (%)	Atypical Behaviour (#)	Atypical Behaviour (%)	Mortality (#)	Mortality (%)	Atypical Behaviour (#)	Atypical Behaviour (%)
% vol/vol	Start	Start	Start	Start	24 hrs	24 hrs	24 hrs	24 hrs	48 hrs	48 hrs	48 hrs	48 hrs
0	15	7.5	282	9.1	0	0	0	0	0	0	0	0
6.25	15	7.7	337	9.1	0	0	0	0	0	0	0	0
12.5	15	7.6	392	9.0	0	0	0	0	0	0	0	0
25	15	7.7	490	9.0	0	0	0	0	0	0	0	0
50	15	8.0	666	9.0	0	0	0	0	0	0	0	0
100	15	8.0	1095	8.9	0	0	0	0	0	0	0	0

Concentration	Mortality (#)	Mortality (%)	Atypical Behaviour (#)	Atypical Behaviour (%)	Temperature (°C)	pH (pH)	Conductivity (uS/cm)	Dissolved Oxygen (mg/L)	Mortality (#)	Mortality (%)	Atypical Behaviour (#)	Atypical Behaviour (%)
% vol/vol	72 hrs	72 hrs	72 hrs	72 hrs	96 hrs	96 hr	96 hrs	96 hrs	96 hrs	96 hrs	96 hrs	96 hrs
0	0	0	0	0	14	7.8	285	8.7	0	0	0	0
6.25	0	0	0	0	14	7.7	339	8.6	0	0	0	0
12.5	0	0	0	0	14	7.5	397	8.5	0	0	0	0
25	0	0	0	0	14	7.4	496	8.1	0	0	0	0
50	0	0	0	0	15	7.1	709	6.7	0	0	0	0
100	0	0	0	0	15	7.8	1105	8.5	0	0	0	0

Comments : None

Culture/Control/Dilution Water

City of Edmonton dechlorinated tap water

Hardness:

160 mg/L CaCO₃

Other parameters available on request.

Test Conditions

Test concentration : 0,6.25,12.5,25,50,100 (% vol/vol)

Organisms per Vessel : 10

Test Temperature : 15 ± 1 °C

Solution Depth :

>15 cm

Total # of Organisms Used : 60

Pre-aeration Time : 30 min.

Rate of Aeration

6.5±1 mL/min/L

Test Volume : 20 L

Vessel Volume : 38L

Test pH Adjusted:

No

Loading Density : 0.3 g/L

Photoperiod :

16:8 (light: dark)

Test Organism :

Rainbow Trout (*Oncorhynchus mykiss*)

Source :

LSL Trout Hatchery

Culture Temperature : 15 ± 2 °C

Weight (Mean) +- SD :

0.7 ± 0.1 g

Length (Mean) +- SD :

4.15 ± 0.25 cm

Culture Water Renewal : ≥ 1.0 L/min/kg fish

Weight (Range) :

0.5 – 0.9 g

Length (Range) :

3.70 – 4.40 cm

Culture Photoperiod : 16:8 (light: dark)

% Mortality within 7 days : 0%

Feeding rate and frequency :

daily: 1-5% biomass of trout.

Acclimation Time:

>14 days

Reference chemical:

Phenol

Test Date:

Sep 27, 2022

Test Endpoint 96 hrs LC50 (95% confidence interval) :

10.2 (9.01, 11.4)mg/L

Statistical Method :

Probit

Historical Mean LC50 (warning limits) :

9.77 (8.63, 11.1) mg/L

Concentration : 0,8,10,12,15,20 mg/L



RESULTS OF RAINBOW TROUT LC50 MULTI-CONCENTRATION

BUREAU
VERITAS

Client : 70036 ALS ENVIRONMENTAL, CALGARY
Client Project Name & Number: EO2208443

Job Number: C277285
Sample Number: BDO096-01

Test Method EPS 1/RM/13
Method Deviations : None

Note: The results contained in this report refer only to the testing of the sample submitted. Bureau Veritas is accredited to ISO/IEC 17025 for specific parameters on scopes of accreditation, including the toxicity parameters reported herein. The conductivity, dissolved oxygen and pH data contained within the toxicity report are provided for information purposes and are not individually accredited parameters. This report may not be reproduced, except in its entirety, without the written approval of the laboratory.

Analyst : Cara Shurgot, Chelsea Tessier, Kaylie Lyons, Kyle Monaghan, Tami Horvath

Verified By : Cara Shurgot, Analyst 2

Date: Oct 14, 2022 09:56 AM

Bureau Veritas Job Number: C277285
Report Date: 2022/10/14

ALS ENVIRONMENTAL
Client Project #: EO2208443

Your P.O. #: EO2208443

RESULTS OF CHEMICAL ANALYSES OF WATER

Bureau Veritas ID		BDO096	
Sampling Date		10/3/2022	
COC Number		80505	
	UNITS	EO2208443-002 - POND C	QC Batch
Daphnia Magna Bioassay			
LC50	% vol/vol	ATTACHED	A743767

RDL = Reportable Detection Limit

N/A = Not Applicable

Results relate only to the items tested.



Your P.O. #: EO2208443
 Your Project #: EO2208443
 Your C.O.C. #: 80505

Attention: ALS Reporting Edmonton

ALS ENVIRONMENTAL
 Bay 7, 1313 44th ave NE
 CALGARY, AB
 CANADA T2E 6L5

Report Date: 2022/10/14
 Report #: R3247811
 Version: 1 - Final

CERTIFICATE OF ANALYSIS

BUREAU VERITAS JOB #: C277285

Received: 2022/10/04, 17:03

Sample Matrix: Water
 # Samples Received: 1

Analyses	Quantity	Date	Date	Laboratory Method	Analytical Method
		Extracted	Analyzed		
Daphnia magna LC50 Multi-Concentration	1	N/A	2022/10/05	EENVSOP-00154	EPS 1 RM14 2nd ed m
Rainbow Trout LC50 Multi-Concentration	1	N/A	2022/10/06	EENVSOP-00160	EPS 1 RM13 2nd ed m

Remarks:

Bureau Veritas is accredited to ISO/IEC 17025 for specific parameters on scopes of accreditation. Unless otherwise noted, procedures used by Bureau Veritas are based upon recognized Provincial, Federal or US method compendia such as CCME, MELCC, EPA, APHA.

All work recorded herein has been done in accordance with procedures and practices ordinarily exercised by professionals in Bureau Veritas' profession using accepted testing methodologies, quality assurance and quality control procedures (except where otherwise agreed by the client and Bureau Veritas in writing). All data is in statistical control and has met quality control and method performance criteria unless otherwise noted. All method blanks are reported; unless indicated otherwise, associated sample data are not blank corrected. Where applicable, unless otherwise noted, Measurement Uncertainty has not been accounted for when stating conformity to the referenced standard.

Bureau Veritas liability is limited to the actual cost of the requested analyses, unless otherwise agreed in writing. There is no other warranty expressed or implied. Bureau Veritas has been retained to provide analysis of samples provided by the Client using the testing methodology referenced in this report. Interpretation and use of test results are the sole responsibility of the Client and are not within the scope of services provided by Bureau Veritas, unless otherwise agreed in writing. Bureau Veritas is not responsible for the accuracy or any data impacts, that result from the information provided by the customer or their agent.

Solid sample results, except biota, are based on dry weight unless otherwise indicated. Organic analyses are not recovery corrected except for isotope dilution methods.

Results relate to samples tested. When sampling is not conducted by Bureau Veritas, results relate to the supplied samples tested. This Certificate shall not be reproduced except in full, without the written approval of the laboratory.

Reference Method suffix "m" indicates test methods incorporate validated modifications from specific reference methods to improve performance.

* RPDs calculated using raw data. The rounding of final results may result in the apparent difference.



Your P.O. #: EO2208443
Your Project #: EO2208443
Your C.O.C. #: 80505

Attention: ALS Reporting Edmonton

ALS ENVIRONMENTAL
Bay 7, 1313 44th ave NE
CALGARY, AB
CANADA T2E 6L5

Report Date: 2022/10/14
Report #: R3247811
Version: 1 - Final

CERTIFICATE OF ANALYSIS

BUREAU VERITAS JOB #: C277285

Received: 2022/10/04, 17:03

Encryption Key

Please direct all questions regarding this Certificate of Analysis to your Project Manager.
Customer Solutions, Western Canada Customer Experience Team
Email: customersolutionswest@bureauveritas.com
Phone# (780) 577-7100

=====
This report has been generated and distributed using a secure automated process.
Bureau Veritas has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per ISO/IEC 17025, signing the reports.
For Service Group specific validation please refer to the Validation Signature Page.



**BUREAU
VERITAS**

Bureau Veritas Job #: C277285
Report Date: 2022/10/14

ALS ENVIRONMENTAL
Client Project #: EO2208443
Your P.O. #: EO2208443

RESULTS OF CHEMICAL ANALYSES OF WATER

Bureau Veritas ID		BDO096	
Sampling Date		2022/10/03 00:00	
COC Number		80505	
	UNITS	EO2208443-002 - POND C	QC Batch
Daphnia Magna Bioassay			
LC50	% vol/vol	ATTACHED	A743767



BUREAU
VERITAS

Bureau Veritas Job #: C277285
Report Date: 2022/10/14

ALS ENVIRONMENTAL
Client Project #: EO2208443
Your P.O. #: EO2208443

TOXICOLOGY (WATER)

Bureau Veritas ID		BDO096	
Sampling Date		2022/10/03 00:00	
COC Number		80505	
	UNITS	EO2208443-002 - POND C	QC Batch
Rainbow Trout Bioassay			
LC50	% vol/vol	ATTACHED	A745247



GENERAL COMMENTS

Each temperature is the average of up to three cooler temperatures taken at receipt

Package 1	5.3°C
Package 2	5.0°C
Package 3	5.0°C
Package 4	6.0°C
Package 5	5.7°C

Results relate only to the items tested.



BUREAU
VERITAS

Bureau Veritas Job #: C277285
Report Date: 2022/10/14

ALS ENVIRONMENTAL
Client Project #: EO2208443
Your P.O. #: EO2208443

VALIDATION SIGNATURE PAGE

The analytical data and all QC contained in this report were reviewed and validated by:

Cara Shurgot, Analyst 2

Chelsea Tessier, Ecotoxicology Supervisor

Bureau Veritas has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per ISO/IEC 17025, signing the reports. For Service Group specific validation please refer to the Validation Signature Page.



Chain of Custody
Edmonton - Environmental
9450 - 17 Avenue NW
Edmonton AB Canada T6N 1M9

80505



Destination Lab: **Bureau Veritas (Edmonton)**

Address: 9331 - 48th Street Edmonton AB Canada
T6B 2R4

Work Order Number: **EO2208443**

Original Receipt Date/Time: 03/10/2022 15:30
Instructions Received

Relinquished By

Date/Time

Received By

Date/Time

Receipt Temp

Return as Indicated: Results: ALSEDClientServices@alsglobal.com Invoice: ALSEDClientServices@alsglobal.com Electronic Data: ALSEDClientServices@alsglobal.com
Attention: Pamela Toledo

ALS Sample ID	Client ID	Matrix	Container Type	Test Codes	Method Description	Due Date	Sampling Date and Time	Remarks
EO2208443-002	Pond C	Water	LDPE carboy	TRT-LC50-96	Survival/LC50 Rainbow Trout (96 hours)	11-10-2022	03/10/2022 00:00	
EO2208443-002	Pond C	Water	LDPE carboy			11-10-2022	03/10/2022 00:00	
EO2208443-002	Pond C	Water	LDPE carboy			11-10-2022	03/10/2022 00:00	
EO2208443-002	Pond C	Water	LDPE carboy			11-10-2022	03/10/2022 00:00	
EO2208443-002	Pond C	Water	LDPE carboy	DAP-LC50-48	Survival/LC50 Daphnia Magna 48 hours	11-10-2022	03/10/2022 00:00	
EO2208443-002	Pond C	Water	LDPE carboy			11-10-2022	03/10/2022 00:00	

In Italia Sirenova 2022/10/09 17:03 see ACTR

C277285



Dispatch Summary
 Edmonton - Environmental
 9450 - 17 Avenue NW
 Edmonton AB Canada T6N 1M9

80608



Destination Lab: **Bureau Veritas (Edmonton)**
 Address: 9331 - 48th Street Edmonton AB Canada T6B 2R4
 Original Receipt Date/Time: 03/10/2022 15:30
 Instructions Received Date/Time:

Relinquished By
 Date/Time
 Received By
 Date/Time
 Receipt Temp

Consignment company and Number
 YELLOWCAB

Number of Coolers
 5

ALS Lab ID	Bottle Code	Matrix	Submatrix	Container Type	Test Codes	Due Date	Holding Time	Remarks
EO2208443	002-AI	Water	Water	LDPE carboy	TRT-LC50-96	14/10/2022		
EO2208443	002-AJ	Water	Water	LDPE carboy		14/10/2022		
EO2208443	002-AK	Water	Water	LDPE carboy		14/10/2022		
EO2208443	002-AL	Water	Water	LDPE carboy		14/10/2022		
EO2208443	002-AM	Water	Water	LDPE carboy	DAP-LC50-48	14/10/2022		
EO2208443	002-AN	Water	Water	LDPE carboy		14/10/2022		

In Julia Syrenova 2022/10/04

17:03

see ACTR

C277285



October 11, 2022

Service Request No:K2211750

Pamela Toledo
ALS Environmental - Canada
9450-17 Ave. NW
Edmonton, AB T6N 1M9

Laboratory Results for: EO2208443

Dear Pamela,

Enclosed are the results of the sample(s) submitted to our laboratory October 07, 2022
For your reference, these analyses have been assigned our service request number **K2211750**.

Analyses were performed according to our laboratory's NELAP-approved quality assurance program. The test results meet requirements of the current NELAP standards, where applicable, and except as noted in the laboratory case narrative provided. For a specific list of NELAP-accredited analytes, refer to the certifications section at www.alsglobal.com. All results are intended to be considered in their entirety, and ALS Group USA Corp. dba ALS Environmental (ALS) is not responsible for use of less than the complete report. Results apply only to the items submitted to the laboratory for analysis and individual items (samples) analyzed, as listed in the report.

Please contact me if you have any questions. My extension is 3260. You may also contact me via email at Luke.Rahn@alsglobal.com.

Respectfully submitted,

ALS Group USA, Corp. dba ALS Environmental

Luke Rahn
Project Manager

ADDRESS 1317 S. 13th Avenue, Kelso, WA 98626
PHONE +1 360 577 7222 | FAX +1 360 636 1068
ALS Group USA, Corp.
dba ALS Environmental



Narrative Documents

ALS Environmental—Kelso Laboratory
1317 South 13th Avenue, Kelso, WA 98626
Phone (360) 577-7222 Fax (360) 425-9096
www.alsglobal.com



Client: ALS Environmental - Canada
Project: EO2208443
Sample Matrix: Water

Service Request: K2211750
Date Received: 10/07/2022

CASE NARRATIVE

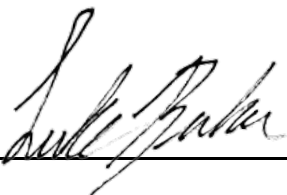
All analyses were performed consistent with the quality assurance program of ALS Environmental. This report contains analytical results for samples for the Tier II level requested by the client.

Sample Receipt:

Two water samples were received for analysis at ALS Environmental on 10/07/2022. Any discrepancies upon initial sample inspection are annotated on the sample receipt and preservation form included within this report. The samples were stored at minimum in accordance with the analytical method requirements.

General Chemistry:

No significant anomalies were noted with this analysis.

Approved by 

Date 10/11/2022



SAMPLE DETECTION SUMMARY

This form includes only detections above the reporting levels. For a full listing of sample results, continue to the Sample Results section of this Report.

CLIENT ID: EO2208443-002		Lab ID: K2211750-002				
Analyte	Results	Flag	MDL	MRL	Units	Method
Halides, Total Organic (TOX)	20			20	ug/L	9020B



Sample Receipt Information

ALS Environmental—Kelso Laboratory
1317 South 13th Avenue, Kelso, WA 98626
Phone (360) 577-7222 Fax (360) 425-9096
www.alsglobal.com

Client: ALS Environmental - Canada
Project: EO2208443

Service Request:K2211750

SAMPLE CROSS-REFERENCE

<u>SAMPLE #</u>	<u>CLIENT SAMPLE ID</u>	<u>DATE</u>	<u>TIME</u>
K2211750-001	EO2208443-001	10/2/2022	2300
K2211750-002	EO2208443-002	10/2/2022	2300



K2211750

80851



Destination Lab: **USA - Kelso**

Address: 1317 South 13th Avenue Kelso DC United States 98626
Client: Clean Harbors Environmental Services, Inc.
Work Order Number: **EO2208443**
Original Receipt Date/Time: 03/10/2022 14:30 Instructions Received

Relinquished By

Date/Time

Received By: *[Signature]*
Date/Time: 10/7/22 1010
Receipt Temp

Return as Indicated: Results: ALSEDClientServices@alsglobal.com Invoice: ALSEDClientServices@alsglobal.com Electronic Data: ALSEDClientServices@alsglobal.com
Attention: Pamela Toledo

ALS Sample ID	Client ID	Matrix	Container Type	Test Codes	Method Description	Due Date	Sampling Date and Time	Remarks
EO2208443-001	Pond B	Water	Amber glass/Teflon lined cap	AOX	Adsorbable Organic Halides (AOX) by Adsorption and Coulometric Titration	14-10-2022	02/10/2022 23:00	
EO2208443-002	Pond C	Water	Amber glass/Teflon lined cap	AOX	Adsorbable Organic Halides (AOX) by Adsorption and Coulometric Titration	14-10-2022	02/10/2022 23:00	

* Method 9020B - TOX

PM Luke

Cooler Receipt and Preservation Form

Client ALS CANADA

Service Request K22 11750

Received: 10-7-22 Opened: 10-7-22 By: YUM Unloaded: 10-7-22 By: YUM

- 1. Samples were received via? USPS Fed Ex UPS DHL PDX Courier Hand Delivered
- 2. Samples were received in: (circle) Cooler Box Envelope Other NA
- 3. Were custody seals on coolers? NA Y N If yes, how many and where? _____
- If present, were custody seals intact? Y N If present, were they signed and dated? Y N

Temp Blank	Sample Temp	IR Gun	Cooler #/COC ID / NA	Out of temp Indicate with "X"	PM Notified If out of temp	Tracking Number NA	Filed
	<u>9.8</u>	<u>1202</u>		<u>X</u>		<u>7701 3804 0110</u>	

- 4. Was a Temperature Blank present in cooler? NA Y N If yes, notate the temperature in the appropriate column above:
If no, take the temperature of a representative sample bottle contained within the cooler; notate in the column "Sample Temp":
- 5. Were samples received within the method specified temperature ranges? NA Y N
If no, were they received on ice and same day as collected? If not, notate the cooler # below and notify the PM. NA Y N

If applicable, tissue samples were received: Frozen Partially Thawed Thawed

- 6. Packing material: Inserts Baggies Bubble Wrap Gel Packs Wet Ice Dry Ice Sleeves
- 7. Were custody papers properly filled out (ink, signed, etc.)? NA Y N
- 8. Were samples received in good condition (unbroken) NA Y N
- 9. Were all sample labels complete (ie, analysis, preservation, etc.)? NA Y N
- 10. Did all sample labels and tags agree with custody papers? NA Y N
- 11. Were appropriate bottles/containers and volumes received for the tests indicated? NA Y N
- 12. Were the pH-preserved bottles (see SMO GEN SOP) received at the appropriate pH? Indicate in the table below NA Y N
- 13. Were VOA vials received without headspace? Indicate in the table below. NA Y N
- 14. Was C12/Res negative? NA Y N
- 15. Were 100ml sterile microbiology bottles filled exactly to the 100ml mark? NA Y N Under filled Overfilled

Sample ID on Bottle	Sample ID on COC	Identified by:

Sample ID	Bottle Count	Bottle Type	Head-space	Broke	pH	Reagent	Volume added	Reagent Lot Number	Initials	Time

Notes, Discrepancies, Resolutions: COC not signed



Miscellaneous Forms

ALS Environmental—Kelso Laboratory
1317 South 13th Avenue, Kelso, WA 98626
Phone (360) 577-7222 Fax (360) 425-9096
www.alsglobal.com

Inorganic Data Qualifiers

- * The result is an outlier. See case narrative.
- # The control limit criteria is not applicable.
- B The analyte was found in the associated method blank at a level that is significant relative to the sample result as defined by the DOD or NELAC standards.
- E The result is an estimate amount because the value exceeded the instrument calibration range.
- J The result is an estimated value.
- U The analyte was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL.
DOD-QSM 4.2 definition : Analyte was not detected and is reported as less than the LOD or as defined by the project. The detection limit is adjusted for dilution.
- i The MRL/MDL or LOQ/LOD is elevated due to a matrix interference.
- X See case narrative.
- Q See case narrative. One or more quality control criteria was outside the limits.
- H The holding time for this test is immediately following sample collection. The samples were analyzed as soon as possible after receipt by the laboratory.

Metals Data Qualifiers

- # The control limit criteria is not applicable.
- J The result is an estimated value.
- E The percent difference for the serial dilution was greater than 10%, indicating a possible matrix interference in the sample.
- M The duplicate injection precision was not met.
- N The Matrix Spike sample recovery is not within control limits. See case narrative.
- S The reported value was determined by the Method of Standard Additions (MSA).
- U The analyte was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL.
DOD-QSM 4.2 definition : Analyte was not detected and is reported as less than the LOD or as defined by the project. The detection limit is adjusted for dilution.
- W The post-digestion spike for furnace AA analysis is out of control limits, while sample absorbance is less than 50% of spike absorbance.
 - i The MRL/MDL or LOQ/LOD is elevated due to a matrix interference.
- X See case narrative.
- + The correlation coefficient for the MSA is less than 0.995.
- Q See case narrative. One or more quality control criteria was outside the limits.

Organic Data Qualifiers

- * The result is an outlier. See case narrative.
- # The control limit criteria is not applicable. See case narrative.
- A A tentatively identified compound, a suspected aldol-condensation product.
- B The analyte was found in the associated method blank at a level that is significant relative to the sample result as defined by the DOD or NELAC standards.
- C The analyte was qualitatively confirmed using GC/MS techniques, pattern recognition, or by comparing to historical data.
- D The reported result is from a dilution.
- E The result is an estimated value.
- J The result is an estimated value.
- N The result is presumptive. The analyte was tentatively identified, but a confirmation analysis was not performed.
- P The GC or HPLC confirmation criteria was exceeded. The relative percent difference is greater than 40% between the two analytical results.
- U The analyte was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL.
DOD-QSM 4.2 definition : Analyte was not detected and is reported as less than the LOD or as defined by the project. The detection limit is adjusted for dilution.
 - i The MRL/MDL or LOQ/LOD is elevated due to a chromatographic interference.
- X See case narrative.
- Q See case narrative. One or more quality control criteria was outside the limits.

Additional Petroleum Hydrocarbon Specific Qualifiers

- F The chromatographic fingerprint of the sample matches the elution pattern of the calibration standard.
- L The chromatographic fingerprint of the sample resembles a petroleum product, but the elution pattern indicates the presence of a greater amount of lighter molecular weight constituents than the calibration standard.
- H The chromatographic fingerprint of the sample resembles a petroleum product, but the elution pattern indicates the presence of a greater amount of heavier molecular weight constituents than the calibration standard.
- O The chromatographic fingerprint of the sample resembles an oil, but does not match the calibration standard.
- Y The chromatographic fingerprint of the sample resembles a petroleum product eluting in approximately the correct carbon range, but the elution pattern does not match the calibration standard.
- Z The chromatographic fingerprint does not resemble a petroleum product.

**ALS Group USA Corp. dba ALS Environmental (ALS) - Kelso
State Certifications, Accreditations, and Licenses**

Agency	Web Site	Number
Alaska DEH	http://dec.alaska.gov/eh/lab/cs/csapproval.htm	UST-040
Arizona DHS	http://www.azdhs.gov/lab/license/env.htm	AZ0339
Arkansas - DEQ	http://www.adeq.state.ar.us/techsvs/labcert.htm	88-0637
California DHS (ELAP)	http://www.cdph.ca.gov/certlic/labs/Pages/ELAP.aspx	2795
DOD ELAP	http://www.denix.osd.mil/edqw/Accreditation/AccreditedLabs.cfm	L16-58-R4
Florida DOH	http://www.doh.state.fl.us/lab/EnvLabCert/WaterCert.htm	E87412
Hawaii DOH	http://health.hawaii.gov/	-
ISO 17025	http://www.pjlabs.com/	L16-57
Louisiana DEQ	http://www.deq.louisiana.gov/page/la-lab-accreditation	03016
Maine DHS	http://www.maine.gov/dhhs/	WA01276
Minnesota DOH	http://www.health.state.mn.us/accreditation	053-999-457
Nevada DEP	http://ndep.nv.gov/bsdw/labservice.htm	WA01276
New Jersey DEP	http://www.nj.gov/dep/enforcement/oqa.html	WA005
New York - DOH	https://www.wadsworth.org/regulatory/elap	12060
North Carolina DEQ	https://deq.nc.gov/about/divisions/water-resources/water-resources-data/water-sciences-home-page/laboratory-certification-branch/non-field-lab-certification	605
Oklahoma DEQ	http://www.deq.state.ok.us/CSDnew/labcert.htm	9801
Oregon – DEQ (NELAP)	http://public.health.oregon.gov/LaboratoryServices/EnvironmentalLaboratoryAccreditation/Pages/index.aspx	WA100010
South Carolina DHEC	http://www.scdhec.gov/environment/EnvironmentalLabCertification/	61002
Texas CEQ	http://www.tceq.texas.gov/field/qa/env_lab_accreditation.html	T104704427
Washington DOE	http://www.ecy.wa.gov/programs/eap/labs/lab-accreditation.html	C544
Wyoming (EPA Region 8)	https://www.epa.gov/region8-waterops/epa-region-8-certified-drinking-water	-
Kelso Laboratory Website	www.alsglobal.com	NA

Analyses were performed according to our laboratory's NELAP-approved quality assurance program. A complete listing of specific NELAP-certified analytes, can be found in the certification section at www.ALSGlobal.com or at the accreditation bodies web site.

Please refer to the certification and/or accreditation body's web site if samples are submitted for compliance purposes. The states highlighted above, require the analysis be listed on the state certification if used for compliance purposes and if the method/analyte is offered by that state.

Acronyms

ASTM	American Society for Testing and Materials
A2LA	American Association for Laboratory Accreditation
CARB	California Air Resources Board
CAS Number	Chemical Abstract Service registry Number
CFC	Chlorofluorocarbon
CFU	Colony-Forming Unit
DEC	Department of Environmental Conservation
DEQ	Department of Environmental Quality
DHS	Department of Health Services
DOE	Department of Ecology
DOH	Department of Health
EPA	U. S. Environmental Protection Agency
ELAP	Environmental Laboratory Accreditation Program
GC	Gas Chromatography
GC/MS	Gas Chromatography/Mass Spectrometry
LOD	Limit of Detection
LOQ	Limit of Quantitation
LUFT	Leaking Underground Fuel Tank
M	Modified
MCL	Maximum Contaminant Level is the highest permissible concentration of a substance allowed in drinking water as established by the USEPA.
MDL	Method Detection Limit
MPN	Most Probable Number
MRL	Method Reporting Limit
NA	Not Applicable
NC	Not Calculated
NCASI	National Council of the Paper Industry for Air and Stream Improvement
ND	Not Detected
NIOSH	National Institute for Occupational Safety and Health
PQL	Practical Quantitation Limit
RCRA	Resource Conservation and Recovery Act
SIM	Selected Ion Monitoring
TPH	Total Petroleum Hydrocarbons
tr	Trace level is the concentration of an analyte that is less than the PQL but greater than or equal to the MDL.

ALS Group USA, Corp.
dba ALS Environmental

Analyst Summary report

Client: ALS Environmental - Canada
Project: EO2208443/

Service Request: K2211750

Sample Name: EO2208443-001
Lab Code: K2211750-001
Sample Matrix: Water

Date Collected: 10/2/22
Date Received: 10/7/22

Analysis Method
9020B

Extracted/Digested By

Analyzed By
KABROWN

Sample Name: EO2208443-002
Lab Code: K2211750-002
Sample Matrix: Water

Date Collected: 10/2/22
Date Received: 10/7/22

Analysis Method
9020B

Extracted/Digested By

Analyzed By
KABROWN



Sample Results

ALS Environmental—Kelso Laboratory
1317 South 13th Avenue, Kelso, WA 98626
Phone (360) 577-7222 Fax (360) 425-9096
www.alsglobal.com



General Chemistry

ALS Environmental—Kelso Laboratory
1317 South 13th Avenue, Kelso, WA 98626
Phone (360) 577-7222 Fax (360) 425-9096
www.alsglobal.com

ALS Group USA, Corp.
dba ALS Environmental

Analytical Report

Client: ALS Environmental - Canada
Project: EO2208443
Sample Matrix: Water
Sample Name: EO2208443-001
Lab Code: K2211750-001

Service Request: K2211750
Date Collected: 10/02/22 23:00
Date Received: 10/07/22 10:10
Basis: NA

General Chemistry Parameters

<u>Analyte Name</u>	<u>Analysis Method</u>	<u>Result</u>	<u>Units</u>	<u>MRL</u>	<u>Dil.</u>	<u>Date Analyzed</u>	<u>Q</u>
Halides, Total Organic (TOX)	9020B	ND U	ug/L	20	1	10/10/22 11:29	

ALS Group USA, Corp.
dba ALS Environmental

Analytical Report

Client: ALS Environmental - Canada
Project: EO2208443
Sample Matrix: Water
Sample Name: EO2208443-002
Lab Code: K2211750-002

Service Request: K2211750
Date Collected: 10/02/22 23:00
Date Received: 10/07/22 10:10
Basis: NA

General Chemistry Parameters

<u>Analyte Name</u>	<u>Analysis Method</u>	<u>Result</u>	<u>Units</u>	<u>MRL</u>	<u>Dil.</u>	<u>Date Analyzed</u>	<u>Q</u>
Halides, Total Organic (TOX)	9020B	20	ug/L	20	1	10/10/22 11:29	

ALS Group USA, Corp.
dba ALS Environmental

Analytical Report

Client: ALS Environmental - Canada
Project: EO2208443
Sample Matrix: Water
Sample Name: Batch QC
Lab Code: KQ2217532-09

Service Request: K2211750
Date Collected: NA
Date Received: NA
Basis: NA

General Chemistry Parameters

<u>Analyte Name</u>	<u>Analysis Method</u>	<u>Result</u>	<u>Units</u>	<u>MRL</u>	<u>Dil.</u>	<u>Date Analyzed</u>	<u>Q</u>
Halides, Total Organic (TOX)	9020B	2160	ug/L	500	25	10/10/22 11:29	



QC Summary Forms

ALS Environmental—Kelso Laboratory
1317 South 13th Avenue, Kelso, WA 98626
Phone (360) 577-7222 Fax (360) 425-9096
www.alsglobal.com



General Chemistry

ALS Environmental—Kelso Laboratory
1317 South 13th Avenue, Kelso, WA 98626
Phone (360) 577-7222 Fax (360) 425-9096
www.alsglobal.com

ALS Group USA, Corp.
dba ALS Environmental

Analytical Report

Client: ALS Environmental - Canada
Project: EO2208443
Sample Matrix: Water
Sample Name: Method Blank
Lab Code: K2211750-MB

Service Request: K2211750
Date Collected: NA
Date Received: NA
Basis: NA

General Chemistry Parameters

<u>Analyte Name</u>	<u>Analysis Method</u>	<u>Result</u>	<u>Units</u>	<u>MRL</u>	<u>Dil.</u>	<u>Date Analyzed</u>	<u>Q</u>
Halides, Total Organic (TOX)	9020B	ND U	ug/L	20	1	10/10/22 11:29	

ALS Group USA, Corp.
dba ALS Environmental

QA/QC Report

Client: ALS Environmental - Canada
Project: EO2208443/
Sample Matrix: Water

Service Request: K2211750
Date Collected: NA
Date Received: NA
Date Analyzed: 10/10/2022
Analysis Lot: 780627

Calibration and Method Blank Summary
Halides, Total Organic (TOX)
9020B

	Halide Check Standard (ug)	Instrument Calibration Standard (ug)	PAR Standard (ug/L)
True Value	3.64	10.0	100
Run A	3.53	9.16	100
Percent Recovery A	97	92	100
Run B	3.39	9.60	
Percent Recovery B	93	96	

ALS Group USA, Corp.
dba ALS Environmental

QA/QC Report

Client: ALS Environmental - Canada
Project: EO2208443
Sample Matrix: Water

Service Request: K2211750
Date Collected: N/A
Date Received: N/A
Date Analyzed: 10/10/22
Date Extracted: NA

Duplicate Matrix Spike Summary
Halides, Total Organic (TOX)

Sample Name: Batch QC
Lab Code: KQ2217532-09
Analysis Method: 9020B
Prep Method: None

Units: ug/L
Basis: NA

Analyte Name	Sample Result	Matrix Spike KQ2217532-09MS			Duplicate Matrix Spike KQ2217532-09DMS			% Rec Limits	RPD	RPD Limit
		Result	Spike Amount	% Rec	Result	Spike Amount	% Rec			
Halides, Total Organic (TOX)	2160	6900	5000	94	7000	5000	96	82-121	2	20

Results flagged with an asterisk (*) indicate values outside control criteria.

Results flagged with a pound (#) indicate the control criteria is not applicable.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

Matrix Spike and Matrix Spike Duplicate Data is presented for information purposes only. The matrix may or may not be relevant to samples reported in this report. The laboratory evaluates system performance based on the LCS and LCSD control limits.

