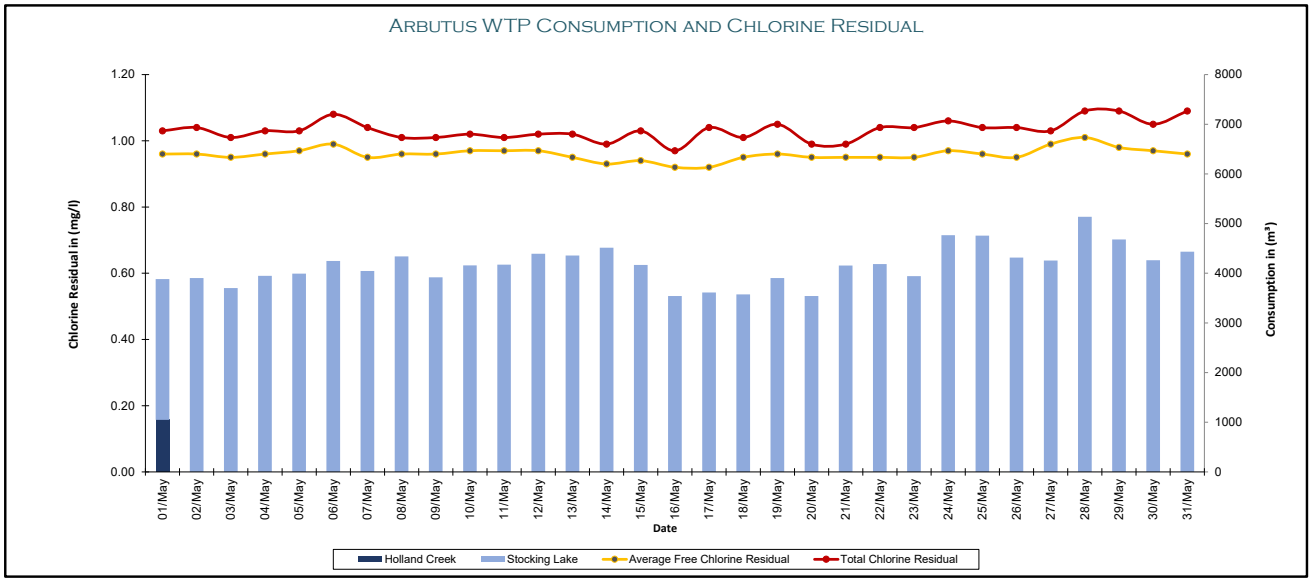
Town of Ladysmith - Arbutus Water treatment Plant

May 2025 - Monthly Report

Date	Daily Flow			Chlorine Residual				CT*	External Lab Testing					
	Stocking Lake	Holland Creek	Combined Flow	Free Min	Free Max	Free Avg	Total		HPC	E.coli	Total Coliforms	Aluminum	THM	HAA
	m³	m³	m³	mg/l	mg/l	mg/l	mg/l	Minutes·mg/l	CFU	MPN	MPN	mg/l	mg/l	mg/l
01-May	2836	1047	3883	0.94	0.97	0.96	1.03	120						
02-May	3902	0	3902	0.95	0.98	0.96	1.04	158						
03-May	3702	0	3702	0.94	0.97	0.95	1.01	131						
04-May	3947	0	3947	0.92	0.96	0.96	1.03	132						
05-May	3993	0	3993	0.93	1.01	0.97	1.03	139						
06-May	4247	0	4247	0.92	1.03	0.99	1.08	125	< 1	< 1	< 1	0.0099	0.0148	0.0091
07-May	4045	0	4045	0.94	0.99	0.95	1.04	133						
08-May	4339	0	4339	0.94	0.97	0.96	1.01	144						
09-May	3918	0	3918	0.94	0.97	0.96	1.01	144						
10-May	4159	0	4159	0.95	0.99	0.97	1.02	136						
11-May	4172	0	4172	0.96	0.97	0.97	1.01	139						
12-May	4392	0	4392	0.96	0.98	0.97	1.02	131						
13-May	4356	0	4356	0.93	0.97	0.95	1.02	139	< 1	< 1	< 1			
14-May	4514	0	4514	0.93	0.97	0.93	0.99	141						
15-May	4166	0	4166	0.92	0.96	0.94	1.03	139						
16-May	3542	0	3542	0.90	0.94	0.92	0.97	137						
17-May	3612	0	3612	0.91	0.93	0.92	1.04	135						
18-May	3575	0	3575	0.90	0.95	0.95	1.01	158						
19-May	3904	0	3904	0.94	0.97	0.96	1.05	145						
20-May	3543	0	3543	0.94	0.97	0.95	0.99	148	< 1	< 1	< 1			
21-May	4156	0	4156	0.93	0.97	0.95	0.99	318						
22-May	4186	0	4186	0.94	0.97	0.95	1.04	145						
23-May	3941	0	3941	0.93	0.98	0.95	1.04	140						
24-May	4766	0	4766	0.93	0.98	0.97	1.06	142						
25-May	4757	0	4757	0.94	0.98	0.96	1.04	160						
26-May	4315	0	4315	0.95	0.97	0.95	1.04	133						
27-May	4255	0	4255	0.93	0.99	0.99	1.03	128	< 1	< 1	< 1			
28-May	5137	0	5137	0.99	1.02	1.01	1.09	166						
29-May	4679	0	4679	0.97	1.02	0.98	1.09	171						
30-May	4263	0	4263	0.96	0.99	0.97	1.05	161						
31-May	4434	0	4434	0.96	0.97	0.96	1.09	171						
Total	127753	1047	128800											
Average	4121	34	4155	0.94	0.98	0.96	1.03	149	< 1	< 1	< 1	0.0099	0.0148	0.00905

*CT - Recorded as the minimum value at the highest daily flow ** Manual Residual were not taken



VEOLIA

InSight

Town of Ladysmith Arbutus DWTP

Monthly LRV and Turbidity Report

05/01/2025 - 06/01/2025

LRV Monthly Average

Asset	Parameter	Health	Avg	Std. Dev	Points	LL	L	%In	% between L and LL	% < LL	Unit
UF 1	LRV		5.0	0.0	33	4.25	4.5	100 %	0 %	0 %	#
UF 2	LRV		5.0	0.0	33	4.25	4.5	100 %	0 %	0 %	#
UF 3	LRV		4.996	0.01	33	4.25	4.5	100 %	0 %	0 %	#

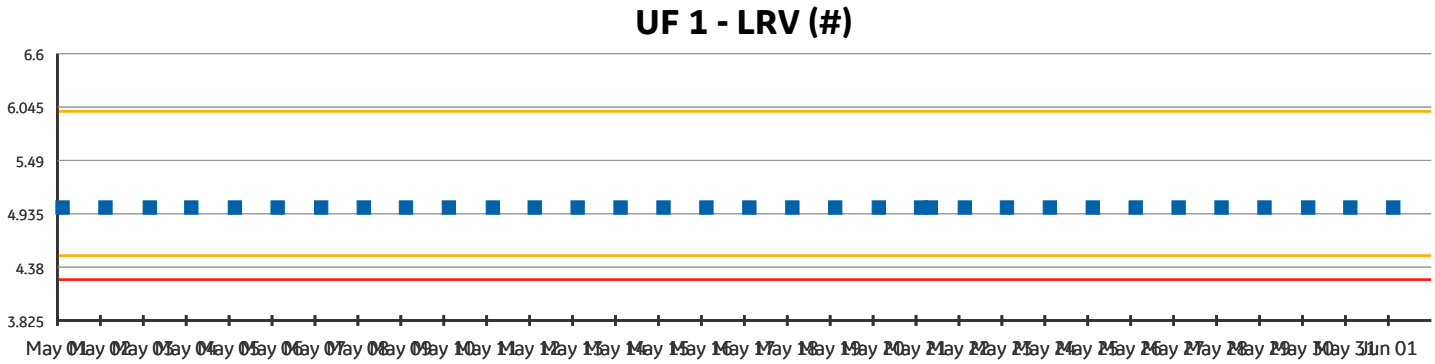
LRV Daily Values

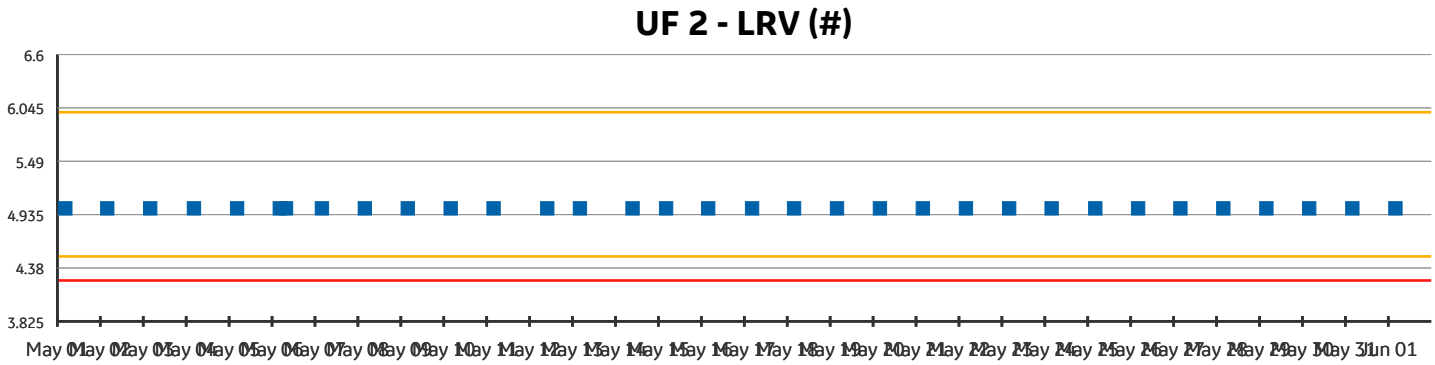
Asset	Parameter	May 01	May 02	May 03	May 04	May 05	May 06	May 07	May 08	May 09	May 10	May 11	May 12
UF 1	LRV	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
UF 2	LRV	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
UF 3	LRV	5.0	5.0	5.0	5.0	5.0	5.0	5.0	4.966	4.953	5.0	5.0	5.0

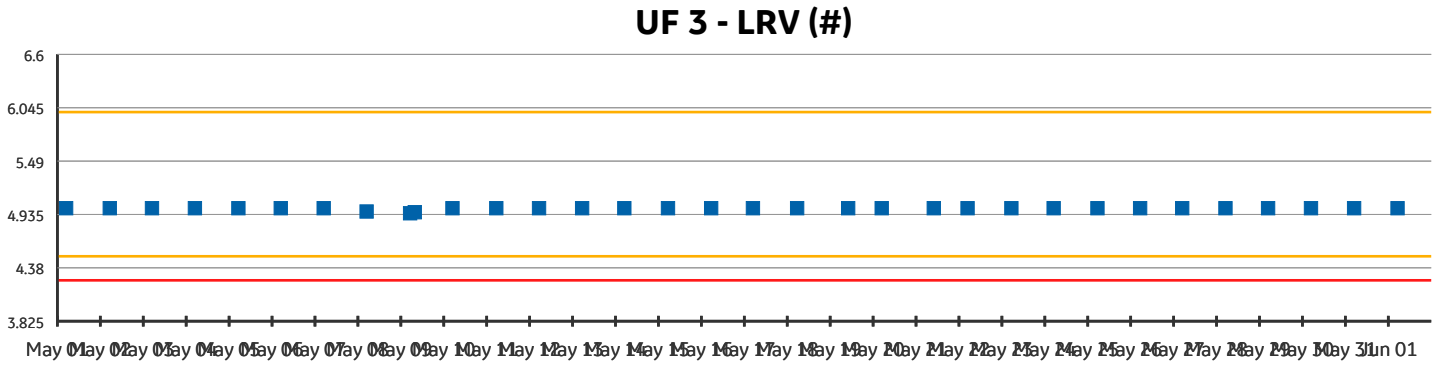
Asset	May 13	May 14	May 15	May 16	May 17	May 18	May 19	May 20	May 21	May 22	May 23	May 24	May 25	May 26	May 27	May 28
UF 1	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
UF 2	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
UF 3	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0

Asset	May 29	May 30	May 31	Jun 01
UF 1	5.0	5.0	5.0	5.0
UF 2	5.0	5.0	5.0	5.0
UF 3	5.0	5.0	5.0	5.0

LRV Raw Data







Turbidity Monthly Average

Asset	Parameter	Health	Avg	Std. Dev	Points	H	HH	%In	% between H and HH	% > HH	Unit
UF 1	PermeateTurbidity		0.016	0.0	45236	--	--	100 %	0 %	0 %	NTU
UF 2	PermeateTurbidity		0.015	0.0	45236	--	--	100 %	0 %	0 %	NTU
UF 3	PermeateTurbidity		0.017	0.0	45236	--	--	100 %	0 %	0 %	NTU
UF 1	PermeateTurbidityAfterBP	●	0.015	0.0	483	0.1	0.3	100 %	0 %	0 %	NTU
UF 2	PermeateTurbidityAfterBP	●	0.015	0.0	477	0.1	0.3	100 %	0 %	0 %	NTU
UF 3	PermeateTurbidityAfterBP	●	0.017	0.0	503	0.1	0.3	100 %	0 %	0 %	NTU

Turbidity Daily Averages

Asset	Parameter	May 01	May 02	May 03	May 04	May 05	May 06	May 07	May 08	May 09	May 10	May 11
UF 1	PermeateTurbidity	0.013	0.013	0.013	0.013	0.014	0.013	0.014	0.014	0.015	0.015	0.015
UF 2	PermeateTurbidity	0.014	0.014	0.014	0.014	0.014	0.014	0.014	0.014	0.014	0.014	0.015
UF 3	PermeateTurbidity	0.013	0.013	0.013	0.014	0.015	0.015	0.015	0.015	0.015	0.015	0.015

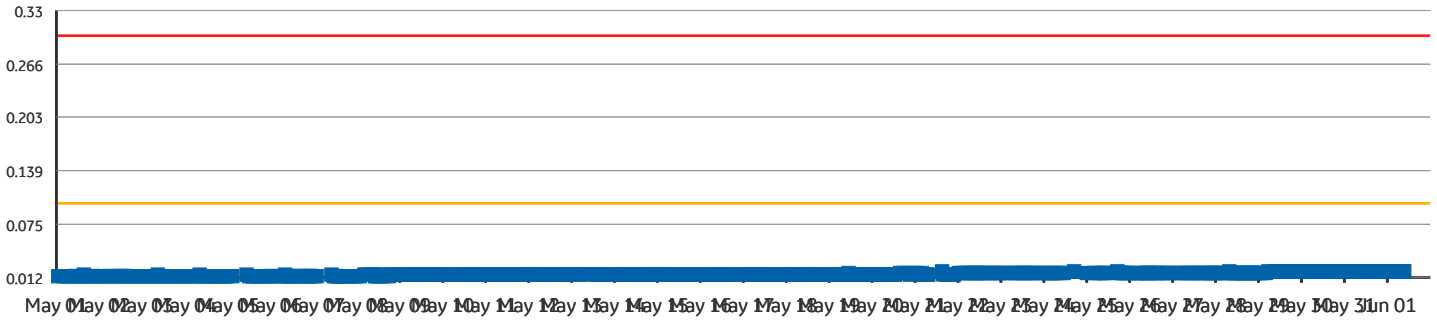
Asset	Parameter	May 01	May 02	May 03	May 04	May 05	May 06	May 07	May 08	May 09	May 10	May 11
UF 1	PermeateTurbidityAfterBP	0.013	0.013	0.013	0.013	0.013	0.013	0.013	0.014	0.015	0.015	0.015
UF 2	PermeateTurbidityAfterBP	0.013	0.014	0.014	0.013	0.013	0.013	0.014	0.014	0.014	0.013	0.015
UF 3	PermeateTurbidityAfterBP	0.014	0.014	0.014	0.014	0.015	0.015	0.015	0.015	0.015	0.015	0.015

Asset	May 12	May 13	May 14	May 15	May 16	May 17	May 18	May 19	May 20	May 21	May 22	May 23	May 24	May 25	May 26
UF 1	0.015	0.015	0.015	0.015	0.015	0.015	0.015	0.015	0.015	0.016	0.017	0.017	0.017	0.017	0.017
UF 2	0.015	0.015	0.015	0.015	0.015	0.015	0.015	0.015	0.015	0.015	0.015	0.015	0.015	0.016	0.016
UF 3	0.015	0.015	0.016	0.017	0.017	0.017	0.017	0.017	0.017	0.017	0.018	0.019	0.019	0.019	0.02
UF 1	0.015	0.015	0.015	0.015	0.015	0.015	0.015	0.015	0.015	0.016	0.017	0.017	0.017	0.017	0.017
UF 2	0.015	0.015	0.015	0.015	0.015	0.015	0.015	0.015	0.015	0.015	0.015	0.015	0.015	0.015	0.016
UF 3	0.015	0.015	0.016	0.017	0.017	0.017	0.017	0.017	0.017	0.017	0.018	0.019	0.019	0.019	0.019

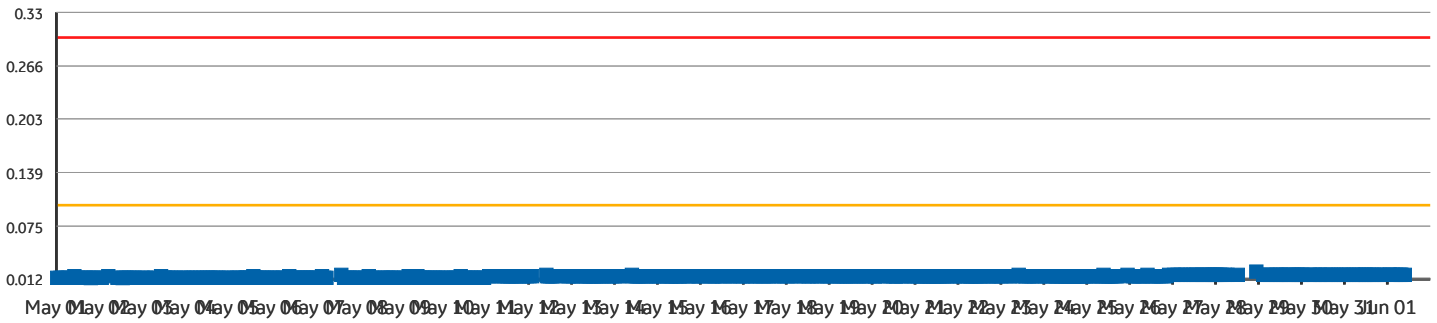
Asset	May 27	May 28	May 29	May 30	May 31	Jun 01
UF 1	0.017	0.017	0.019	0.019	0.019	0.019
UF 2	0.017	0.017	0.017	0.017	0.017	0.017
UF 3	0.02	0.02	0.021	0.021	0.021	0.021
UF 1	0.017	0.017	0.018	0.019	0.019	0.019
UF 2	0.017	0.017	0.017	0.017	0.017	0.017
UF 3	0.02	0.02	0.021	0.021	0.021	0.021

Turbidity Raw Data

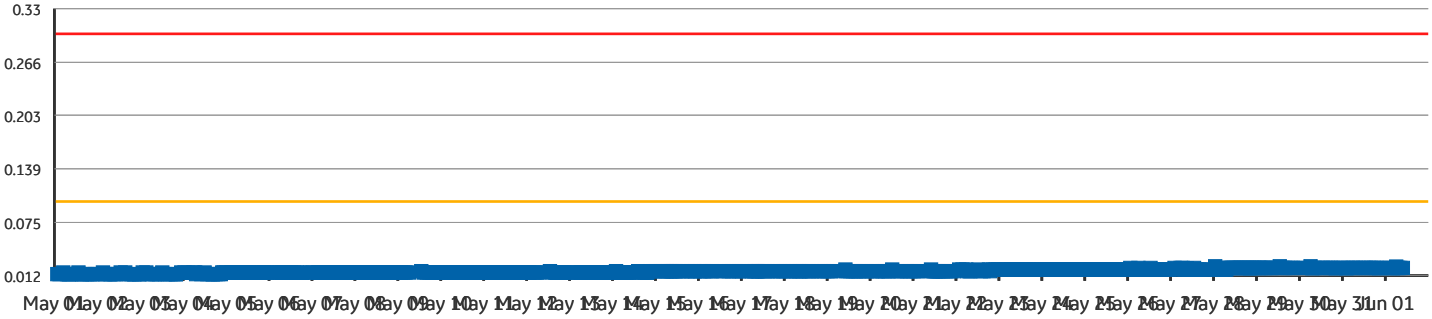
UF 1 - PermeateTurbidityAfterBP (NTU)



UF 2 - PermeateTurbidityAfterBP (NTU)



UF 3 - PermeateTurbidityAfterBP (NTU)



CERTIFICATE OF ANALYSIS

Work Order	:	**VA25B0437**			
Client	:	**Town of Ladysmith**	Laboratory	:	ALS Environmental - Vancouver
Contact	:	Shawn Baker	Account Manager	:	Kevin Bhikadia
Address	:	410 Esplanade PO Box 220 Ladysmith British Columbia Canada V9G 1A2	Address	:	8081 Lougheed Highway Burnaby BC Canada V5A 1W9
Telephone	:	----	E-mail	:	Kevin.Bhikadia@alsglobal.com
Project	:	Arbutus Water Treatment Plant - Monthly Sampling	Telephone	:	+1 604 253 4188
PO	:	10940	Date Samples Received	:	07-May-2025 11:25
C-O-C number	:	----	Date Analysis Commenced	:	08-May-2025
Sampler	:	----	Issue Date	:	13-May-2025 12:00
Site	:	RFP Tender No. 2022-IS-20 Extension			
Quote number	:	Town of Ladysmith Standing Offer			
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
- 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.

Signatories	*Position*	*Laboratory Department*
Kevin Duarte	Supervisor - Metals ICP Instrumentation	Metals, Burnaby, British Columbia
Kim Jensen	Department Manager - Metals	Organics, Burnaby, British Columbia
Stephanie Pinheiro	Team Leader - LCMS	LCMS, Waterloo, Ontario

General Comments

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

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

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

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

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

Unit	*Description*
mg/L	milligrams per litre
µg/L	micrograms per litre

<: less than.
>: greater than.
Surrogate: An analyte that is similar in behavior to target analyte(s), but that does not occur naturally in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery.

Test results reported relate only to the samples as received by the laboratory.
UNLESS OTHERWISE STATED on SRN or QCI Report, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.

Analytical Results

Sub-Matrix: Water
(Matrix: Water)

Analyte	CAS Number	Method/Lab	LOR	Unit	Client sample ID	Treated Water (post reservoir)	----	----	----	----
					Client sampling date / time	06-May-2025 10:30	----	----	----	----
						VA25B0437-001	----	----	----	----
						Result	----	----	----	----
Total Metals										
Aluminum, total	7429-90-5	E420/VA	0.0030	mg/L		0.0099	----	----	----	----
Volatile Organic Compounds [THMs]										
Bromodichloromethane	75-27-4	E611B/VA	1.0	µg/L		1.0	----	----	----	----
Bromoform	75-25-2	E611B/VA	1.0	µg/L		<1.0	----	----	----	----
Chloroform	67-66-3	E611B/VA	1.0	µg/L		13.8	----	----	----	----
Dibromochloromethane	124-48-1	E611B/VA	1.0	µg/L		<1.0	----	----	----	----
Trihalomethanes [THMs], total	----	E611B/VA	2.0	µg/L		14.8	----	----	----	----
Volatile Organic Compounds [THMs] Surrogates										
Bromofluorobenzene, 4-	460-00-4	E611B/VA	1.0	%		94.8	----	----	----	----
Difluorobenzene, 1,4-	540-36-3	E611B/VA	1.0	%		97.6	----	----	----	----
Haloacetic Acids										
Bromochloroacetic acid	5589-96-8	E750/WT	1.00	µg/L		<1.00	----	----	----	----
Dibromoacetic acid	631-64-1	E750/WT	1.00	µg/L		<1.00	----	----	----	----
Dichloroacetic acid	79-43-6	E750/WT	1.00	µg/L		4.25	----	----	----	----
Monobromoacetic acid	79-08-3	E750/WT	1.00	µg/L		<1.00	----	----	----	----
Monochloroacetic acid	79-11-8	E750/WT	1.00	µg/L		<1.00	----	----	----	----
Trichloroacetic acid	76-03-9	E750/WT	1.00	µg/L		4.80	----	----	----	----
Haloacetic acids, total [HAA5]	n/a	E750/WT	5.00	µg/L		9.05	----	----	----	----

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

ALS Canada Ltd.

right solutions.
right partner.

QUALITY CONTROL INTERPRETIVE REPORT

Work Order	: **VA25B0437**	Page	: 1 of 5
Client	: **Town of Ladysmith**	Laboratory	: ALS Environmental - Vancouver
Contact	: Shawn Baker	Account Manager	: Kevin Bhikadia
Address	: 410 Esplanade PO Box 220 Ladysmith BC Canada V9G 1A2	Address	: 8081 Lougheed Highway Burnaby, British Columbia Canada V5A 1W9
Telephone	: ----	Telephone	: +1 604 253 4188
Project	: Arbutus Water Treatment Plant - Monthly Sampling	Date Samples Received	: 07-May-2025 11:25
PO	: 10940	Issue Date	: 13-May-2025 12:01
C-O-C number	: ----		
Sampler	: ----		
Site	: RFP Tender No. 2022-IS-20 Extension		
Quote number	: Town of Ladysmith Standing Offer_V2		
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 Matrix Spike Duplicate (MSD) 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)

- No Analysis Holding Time Outliers exist.

Outliers : Frequency of Quality Control Samples

- No Quality Control Sample Frequency Outliers occur.

CERTIFICATE OF ANALYSIS

Work Order	:	**VA25B0432**		
Client	:	**Town of Ladysmith**	Laboratory	: ALS Environmental - Vancouver
Contact	:	Shawn Baker	Account Manager	: Kevin Bhikadia
Address	:	410 Esplanade PO Box 220 Ladysmith British Columbia Canada V9G 1A2	Address	: 8081 Lougheed Highway Burnaby BC Canada V5A 1W9
Telephone	:	----	E-mail	: Kevin.Bhikadia@alsglobal.com
Project	:	Arbutus Water Treatment Plant - Weekly Sampling	Telephone	: +1 604 253 4188
PO	:	10940	Date Samples Received	: 07-May-2025 11:25
C-O-C number	:	----	Date Analysis Commenced	: 07-May-2025
Sampler	:	----	Issue Date	: 13-May-2025 12:10
Site	:	Town of Ladysmith		
Quote number	:	Town of Ladysmith Standing Offer		
No. of samples received	:	4		
No. of samples analysed	:	4		

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

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results

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

Signatories

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

Signatories	*Position*	*Laboratory Department*
Lindsay Gung	Department Manager - Inorganics	Microbiology, Burnaby, British Columbia
Miles Gropen	Department Manager - Inorganics	Microbiology, Burnaby, British Columbia
Monica Ko	Lab Assistant	Inorganics, Burnaby, British Columbia
Vicky Chen	Lab Assistant	Inorganics, Burnaby, British Columbia

General Comments

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

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

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

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

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

Unit	*Description*
-	no units
CFU/mL	colony forming units per millilitre
CU	colour units (1 cu = 1 mg/l pt)
mg/L	milligrams per litre
MPN/100mL	most probable number per hundred millilitres
NTU	nephelometric turbidity units
pH units	pH units
µS/cm	microsiemens per centimetre

<: 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 (Matrix: Water)					Client sample ID	Raw Water	DAF Effluent	UF Effluent	Treated Water (post reservoir)	----
					Client sampling date / time	06-May-2025 10:30	06-May-2025 10:30	06-May-2025 10:30	06-May-2025 10:30	----
Analyte	CAS Number	Method/Lab	LOR	Unit		VA25B0432-001	VA25B0432-002	VA25B0432-003	VA25B0432-004	----
						Result	Result	Result	Result	----
Sample Preparation										
Dissolved carbon filtration location	----	EP358/VA	-	-		lab	lab	lab	----	----
Physical Tests										
Alkalinity, total (as CaCO3)	----	E290/VA	1.0	mg/L		----	----	----	12.3	----
Colour, true	----	E329/VA	5.0	CU		----	----	----	<5.0	----
Conductivity	----	E100/VA	2.0	µS/cm		----	----	----	56.8	----
pH	----	E108/VA	0.10	pH units		----	----	----	7.36	----
Turbidity	----	E121/VA	0.10	NTU		----	----	----	<0.10	----
Organic / Inorganic Carbon										
Carbon, dissolved organic [DOC]	----	E358-L/VA	0.50	mg/L		2.33	0.93	0.88	----	----
Carbon, total organic [TOC]	----	E355-L/VA	0.50	mg/L		2.39	1.10	0.73	----	----
Microbiological Tests										
Heterotrophic plate count [HPC]	----	E020/VA	1	CFU/mL		----	----	----	<1	----
Coliforms, Escherichia coli [E. coli]	----	E010/VA	1	MPN/100 mL		----	----	----	<1	----
Coliforms, total	----	E010/VA	1	MPN/100 mL		----	----	----	<1	----

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

ALS Canada Ltd.

right solutions.
right partner.

QUALITY CONTROL INTERPRETIVE REPORT

Work Order	: **VA25B0432**	Page	: 1 of 7
Client	: **Town of Ladysmith**	Laboratory	: ALS Environmental - Vancouver
Contact	: Shawn Baker	Account Manager	: Kevin Bhikadia
Address	: 410 Esplanade PO Box 220 Ladysmith BC Canada V9G 1A2	Address	: 8081 Lougheed Highway Burnaby, British Columbia Canada V5A 1W9
Telephone	: ----	Telephone	: +1 604 253 4188
Project	: Arbutus Water Treatment Plant - Weekly Sampling	Date Samples Received	: 07-May-2025 11:25
PO	: 10940	Issue Date	: 13-May-2025 12:09
C-O-C number	: ----		
Sampler	: ----		
Site	: Town of Ladysmith		
Quote number	: Town of Ladysmith Standing Offer_V2		
No. of samples received	: 4		
No. of samples analysed	: 4		

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.

CERTIFICATE OF ANALYSIS

Work Order	:	**VA25B1098**			
Client	:	**Town of Ladysmith**	Laboratory	:	ALS Environmental - Vancouver
Contact	:	Shawn Baker	Account Manager	:	Kevin Bhikadia
Address	:	410 Esplanade PO Box 220 Ladysmith British Columbia Canada V9G 1A2	Address	:	8081 Lougheed Highway Burnaby BC Canada V5A 1W9
Telephone	:	----	E-mail	:	Kevin.Bhikadia@alsglobal.com
Project	:	Arbutus Water Treatment Plant - Weekly Sampling	Telephone	:	+1 604 253 4188
PO	:	10940	Date Samples Received	:	14-May-2025 11:20
C-O-C number	:	----	Date Analysis Commenced	:	14-May-2025
Sampler	:	----	Issue Date	:	22-May-2025 08:58
Site	:	Town of Ladysmith			
Quote number	:	Town of Ladysmith Standing Offer			
No. of samples received	:	4			
No. of samples analysed	:	4			

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

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results

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

Signatories

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

Signatories	*Position*	*Laboratory Department*
Anita Chuang	Lab Assistant	Inorganics, Burnaby, British Columbia
Lindsay Gung	Department Manager - Inorganics	Inorganics, Burnaby, British Columbia
Lindsay Gung	Department Manager - Inorganics	Microbiology, Burnaby, British Columbia
Miles Gropen	Department Manager - Inorganics	Inorganics, Burnaby, British Columbia
Vicky Chen	Lab Assistant	Inorganics, Burnaby, British Columbia

General Comments

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

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

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

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

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

Unit	*Description*
-	no units
CFU/mL	colony forming units per millilitre
CU	colour units (1 cu = 1 mg/l pt)
mg/L	milligrams per litre
MPN/100mL	most probable number per hundred millilitres
NTU	nephelometric turbidity units
pH units	pH units
µS/cm	microsiemens per centimetre

<: 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.

Workorder Comments

Sample(s) 004: Exceeded Recommended Holding Time prior to receipt at the lab for HPC analysis.

Analytical Results

Sub-Matrix: Water (Matrix: Water)					Client sample ID	Raw Water	DAF Effluent	UF Effluent	Treated Water (post reservoir)	----
					Client sampling date / time	13-May-2025 10:30	13-May-2025 10:30	13-May-2025 10:30	13-May-2025 10:30	----
Analyte	CAS Number	Method/Lab	LOR	Unit		VA25B1098-001	VA25B1098-002	VA25B1098-003	VA25B1098-004	----
						Result	Result	Result	Result	----
Sample Preparation										
Dissolved carbon filtration location	----	EP358/VA	-	-		lab	lab	lab	----	----
Physical Tests										
Alkalinity, total (as CaCO3)	----	E290/VA	1.0	mg/L		----	----	----	11.4	----
Colour, true	----	E329/VA	5.0	CU		----	----	----	<5.0	----
Conductivity	----	E100/VA	2.0	µS/cm		----	----	----	56.4	----
pH	----	E108/VA	0.10	pH units		----	----	----	7.24	----
Turbidity	----	E121/VA	0.10	NTU		----	----	----	<0.10	----
Organic / Inorganic Carbon										
Carbon, dissolved organic [DOC]	----	E358-L/VA	0.50	mg/L		2.40	0.88	0.93	----	----
Carbon, total organic [TOC]	----	E355-L/VA	0.50	mg/L		2.21	1.06	0.87	----	----
Microbiological Tests										
Heterotrophic plate count [HPC]	----	E020/VA	1	CFU/mL		----	----	----	<1	----
Coliforms, Escherichia coli [E. coli]	----	E010/VA	1	MPN/100 mL		----	----	----	<1	----
Coliforms, total	----	E010/VA	1	MPN/100 mL		----	----	----	<1	----

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

ALS Canada Ltd.

right solutions.
right partner.

QUALITY CONTROL INTERPRETIVE REPORT

Work Order	: **VA25B1098**	Page	: 1 of 7
Client	: **Town of Ladysmith**	Laboratory	: ALS Environmental - Vancouver
Contact	: Shawn Baker	Account Manager	: Kevin Bhikadia
Address	: 410 Esplanade PO Box 220 Ladysmith BC Canada V9G 1A2	Address	: 8081 Lougheed Highway Burnaby, British Columbia Canada V5A 1W9
Telephone	: ----	Telephone	: +1 604 253 4188
Project	: Arbutus Water Treatment Plant - Weekly Sampling	Date Samples Received	: 14-May-2025 11:20
PO	: 10940	Issue Date	: 22-May-2025 08:58
C-O-C number	: ----		
Sampler	: ----		
Site	: Town of Ladysmith		
Quote number	: Town of Ladysmith Standing Offer_V2		
No. of samples received	: 4		
No. of samples analysed	: 4		

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.

CERTIFICATE OF ANALYSIS

Work Order	:	**VA25B1705**			
Client	:	**Town of Ladysmith**	Laboratory	:	ALS Environmental - Vancouver
Contact	:	Shawn Baker	Account Manager	:	Kevin Bhikadia
Address	:	410 Esplanade PO Box 220 Ladysmith British Columbia Canada V9G 1A2	Address	:	8081 Lougheed Highway Burnaby BC Canada V5A 1W9
Telephone	:	----	E-mail	:	Kevin.Bhikadia@alsglobal.com
Project	:	Arbutus Water Treatment Plant - Weekly Sampling	Telephone	:	+1 604 253 4188
PO	:	10940	Date Samples Received	:	21-May-2025 09:40
C-O-C number	:	----	Date Analysis Commenced	:	21-May-2025
Sampler	:	----	Issue Date	:	26-May-2025 14:26
Site	:	Town of Ladysmith			
Quote number	:	Town of Ladysmith Standing Offer			
No. of samples received	:	4			
No. of samples analysed	:	4			

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

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results

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

Signatories

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

Signatories	*Position*	*Laboratory Department*
Claire Yang	Lab Assistant	Inorganics, Burnaby, British Columbia
Miles Gropen	Department Manager - Inorganics	Inorganics, Burnaby, British Columbia
Miles Gropen	Department Manager - Inorganics	Microbiology, Burnaby, British Columbia

General Comments

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

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

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

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

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

Unit	*Description*
-	no units
CFU/mL	colony forming units per millilitre
CU	colour units (1 cu = 1 mg/l pt)
mg/L	milligrams per litre
MPN/100mL	most probable number per hundred millilitres
NTU	nephelometric turbidity units
pH units	pH units
µS/cm	microsiemens per centimetre

<: less than.
>: greater than.
Surrogate: An analyte that is similar in behavior to target analyte(s), but that does not occur naturally in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery.

Test results reported relate only to the samples as received by the laboratory.
UNLESS OTHERWISE STATED on SRN or QCI Report, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.

Qualifiers

Qualifier	Description
SFP	Sample was filtered and preserved at the laboratory.

Analytical Results

Sub-Matrix: Water (Matrix: Water)				Client sample ID	Raw Water	DAF Effluent	UF Effluent	Treated Water (post reservoir)	----
				Client sampling date / time	20-May-2025 10:30	20-May-2025 10:30	20-May-2025 10:30	20-May-2025 10:30	----
Analyte	CAS Number	Method/Lab	LOR	Unit	VA25B1705-001	VA25B1705-002	VA25B1705-003	VA25B1705-004	----
					Result	Result	Result	Result	----
Sample Preparation									
Dissolved carbon filtration location	----	EP358/VA	-	-	field	field	field	----	----
Physical Tests									
Alkalinity, total (as CaCO3)	----	E290/VA	1.0	mg/L	----	----	----	11.4	----
Colour, true	----	E329/VA	5.0	CU	----	----	----	<5.0	----
Conductivity	----	E100/VA	2.0	µS/cm	----	----	----	55.4	----
pH	----	E108/VA	0.10	pH units	----	----	----	7.39	----
Turbidity	----	E121/VA	0.10	NTU	----	----	----	0.16	----
Organic / Inorganic Carbon									
Carbon, dissolved organic [DOC]	----	E358-L/VA	0.50	mg/L	2.62 SFP	1.03 SFP	1.00 SFP	----	----
Carbon, total organic [TOC]	----	E355-L/VA	0.50	mg/L	2.94	1.17	0.84	----	----
Microbiological Tests									
Heterotrophic plate count [HPC]	----	E020/VA	1	CFU/mL	----	----	----	<1	----
Coliforms, Escherichia coli [E. coli]	----	E010/VA	1	MPN/100 mL	----	----	----	<1	----
Coliforms, total	----	E010/VA	1	MPN/100 mL	----	----	----	<1	----

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

ALS Canada Ltd.

right solutions.
right partner.

QUALITY CONTROL INTERPRETIVE REPORT

Work Order	: **VA25B1705**	Page	: 1 of 8
Client	: **Town of Ladysmith**	Laboratory	: ALS Environmental - Vancouver
Contact	: Shawn Baker	Account Manager	: Kevin Bhikadia
Address	: 410 Esplanade PO Box 220 Ladysmith BC Canada V9G 1A2	Address	: 8081 Lougheed Highway Burnaby, British Columbia Canada V5A 1W9
Telephone	: ----	Telephone	: +1 604 253 4188
Project	: Arbutus Water Treatment Plant - Weekly Sampling	Date Samples Received	: 21-May-2025 09:40
PO	: 10940	Issue Date	: 26-May-2025 14:25
C-O-C number	: ----		
Sampler	: ----		
Site	: Town of Ladysmith		
Quote number	: Town of Ladysmith Standing Offer_V2		
No. of samples received	: 4		
No. of samples analysed	: 4		

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 Laboratory Control Sample (LCS) outliers occur
- No Matrix Spike outliers occur.
- Duplicate 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.

CERTIFICATE OF ANALYSIS

Work Order	:	**VA25B2291**		
Client	:	**Town of Ladysmith**	Laboratory	: ALS Environmental - Vancouver
Contact	:	Shawn Baker	Account Manager	: Kevin Bhikadia
Address	:	410 Esplanade PO Box 220 Ladysmith British Columbia Canada V9G 1A2	Address	: 8081 Lougheed Highway Burnaby BC Canada V5A 1W9
Telephone	:	----	E-mail	: Kevin.Bhikadia@alsglobal.com
Project	:	Arbutus Water Treatment Plant - Quarterly Lake Sampling	Telephone	: +1 604 253 4188
PO	:	10940	Date Samples Received	: 27-May-2025 11:00
C-O-C number	:	----	Date Analysis Commenced	: 27-May-2025
Sampler	:	----	Issue Date	: 03-Jun-2025 11:00
Site	:	RFP Tender No. 2022-IS-20 Extension		
Quote number	:	Town of Ladysmith Standing Offer		
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.

Signatories	*Position*	*Laboratory Department*
Anita Chuang	Lab Assistant	Inorganics, Burnaby, British Columbia
Janice Leung	Supervisor - Organics Instrumentation	Organics, Burnaby, British Columbia
Kevin Duarte	Supervisor - Metals ICP Instrumentation	Metals, Burnaby, British Columbia
Kim Jensen	Department Manager - Metals	Metals, Burnaby, British Columbia
Lindsay Gung	Department Manager - Inorganics	Microbiology, Burnaby, British Columbia
Monica Ko	Supervisor - Inorganic	Inorganics, Burnaby, British Columbia
Tracy Harley	Supervisor - Water Quality Instrumentation	Inorganics, Burnaby, British Columbia

General Comments

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

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

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

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

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

Unit	*Description*
-	no units
% T/cm	% transmittance per centimetre
AU/cm	absorbance units per centimetre
CU	colour units (1 cu = 1 mg/l pt)
mg/L	milligrams per litre
MPN/100mL	most probable number per hundred millilitres
NTU	nephelometric turbidity units
pH units	pH units
µg/L	micrograms per litre

<: less than.
>: greater than.
Surrogate: An analyte that is similar in behavior to target analyte(s), but that does not occur naturally in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery.

Test results reported relate only to the samples as received by the laboratory.
UNLESS OTHERWISE STATED on SRN or QCI Report, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.

Analytical Results

Sub-Matrix: Lake Water
(Matrix: Water)

Analyte	CAS Number	Method/Lab	LOR	Unit	Client sample ID	Stocking Lake	Holland Lake	----	----	----
					Client sampling date / time	26-May-2025 08:35	26-May-2025 09:50	----	----	----
						VA25B2291-001	VA25B2291-002	----	----	----
						Result	Result	----	----	----
Sample Preparation										
Dissolved carbon filtration location	----	EP358/VA	-	-		lab	lab	----	----	----
Physical Tests										
Absorbance, UV (@ 254nm)	----	E404/VA	0.0050	AU/cm		0.0720	0.0940	----	----	----
Alkalinity, total (as CaCO3)	----	E290/VA	1.0	mg/L		8.7	3.2	----	----	----
Colour, true	----	E329/VA	5.0	CU		8.2	10.9	----	----	----
Hardness (as CaCO3), from total Ca/Mg	----	EC100A/VA	0.60	mg/L		9.70	4.16	----	----	----
pH	----	E108/VA	0.10	pH units		7.17	6.71	----	----	----
Solids, total dissolved [TDS]	----	E162/VA	10	mg/L		19	16	----	----	----
Turbidity	----	E121/VA	0.10	NTU		0.55	0.52	----	----	----
Transmittance, UV (@ 254nm)	----	E404/VA	1.0	% T/cm		84.7	80.5	----	----	----
Anions and Nutrients										
Bromide	24959-67-9	E235.Br-L/VA	0.050	mg/L		<0.050	<0.050	----	----	----
Organic / Inorganic Carbon										
Carbon, dissolved organic [DOC]	----	E358-L/VA	0.50	mg/L		3.12	3.30	----	----	----
Carbon, total organic [TOC]	----	E355-L/VA	0.50	mg/L		2.74	3.03	----	----	----
Microbiological Tests										
Coliforms, Escherichia coli [E. coli]	----	E010/VA	1	MPN/100 mL		<1	<1	----	----	----
Coliforms, total	----	E010/VA	1	MPN/100 mL		18	365	----	----	----
Total Metals										
Aluminum, total	7429-90-5	E420/VA	0.0030	mg/L		0.0375	0.0600	----	----	----
Antimony, total	7440-36-0	E420/VA	0.00010	mg/L		<0.00010	<0.00010	----	----	----

Analytical Results

Sub-Matrix: Lake Water
(Matrix: Water)

Analyte	CAS Number	Method/Lab	LOR	Unit	Client sample ID	Stocking Lake	Holland Lake	----	----	----
					Client sampling date / time	26-May-2025 08:35	26-May-2025 09:50	----	----	----
						VA25B2291-001	VA25B2291-002	----	----	----
						Result	Result	----	----	----
Total Metals										
Arsenic, total	7440-38-2	E420/VA	0.00010	mg/L		<0.00010	<0.00010	----	----	----
Barium, total	7440-39-3	E420/VA	0.00010	mg/L		0.00306	0.00345	----	----	----
Beryllium, total	7440-41-7	E420/VA	0.000100	mg/L		<0.000100	<0.000100	----	----	----
Bismuth, total	7440-69-9	E420/VA	0.000050	mg/L		<0.000050	<0.000050	----	----	----
Boron, total	7440-42-8	E420/VA	0.010	mg/L		0.017	<0.010	----	----	----
Cadmium, total	7440-43-9	E420/VA	0.0000050	mg/L		<0.0000050	0.0000082	----	----	----
Calcium, total	7440-70-2	E420/VA	0.050	mg/L		3.10	1.27	----	----	----
Cesium, total	7440-46-2	E420/VA	0.000010	mg/L		<0.000010	<0.000010	----	----	----
Chromium, total	7440-47-3	E420/VA	0.00050	mg/L		<0.00050	<0.00050	----	----	----
Cobalt, total	7440-48-4	E420/VA	0.00010	mg/L		<0.00010	<0.00010	----	----	----
Copper, total	7440-50-8	E420/VA	0.00050	mg/L		<0.00050	0.00088	----	----	----
Iron, total	7439-89-6	E420/VA	0.010	mg/L		0.040	0.063	----	----	----
Lead, total	7439-92-1	E420/VA	0.000050	mg/L		<0.000050	<0.000050	----	----	----
Lithium, total	7439-93-2	E420/VA	0.0010	mg/L		<0.0010	<0.0010	----	----	----
Magnesium, total	7439-95-4	E420/VA	0.0050	mg/L		0.476	0.240	----	----	----
Manganese, total	7439-96-5	E420/VA	0.00010	mg/L		0.00359	0.00730	----	----	----
Mercury, total	7439-97-6	E508/VA	0.0000050	mg/L		<0.0000050	<0.0000050	----	----	----
Molybdenum, total	7439-98-7	E420/VA	0.000050	mg/L		0.000171	<0.000050	----	----	----
Nickel, total	7440-02-0	E420/VA	0.00050	mg/L		<0.00050	<0.00050	----	----	----
Phosphorus, total	7723-14-0	E420/VA	0.050	mg/L		<0.050	<0.050	----	----	----
Potassium, total	7440-09-7	E420/VA	0.050	mg/L		0.220	0.112	----	----	----

Analytical Results

Sub-Matrix: Lake Water
(Matrix: Water)

Analyte	CAS Number	Method/Lab	LOR	Unit	Client sample ID	Stocking Lake	Holland Lake	----	----	----
					Client sampling date / time	26-May-2025 08:35	26-May-2025 09:50	----	----	----
						VA25B2291-001	VA25B2291-002	----	----	----
						Result	Result	----	----	----
Total Metals										
Rubidium, total	7440-17-7	E420/VA	0.00020	mg/L		0.00054	0.00037	----	----	----
Selenium, total	7782-49-2	E420/VA	0.000050	mg/L		<0.000050	<0.000050	----	----	----
Silicon, total	7440-21-3	E420/VA	0.10	mg/L		1.68	1.17	----	----	----
Silver, total	7440-22-4	E420/VA	0.000010	mg/L		<0.000010	<0.000010	----	----	----
Sodium, total	7440-23-5	E420/VA	0.050	mg/L		1.03	0.693	----	----	----
Strontium, total	7440-24-6	E420/VA	0.00020	mg/L		0.0101	0.00592	----	----	----
Sulfur, total	7704-34-9	E420/VA	0.50	mg/L		<0.50	<0.50	----	----	----
Tellurium, total	13494-80-9	E420/VA	0.00020	mg/L		<0.00020	<0.00020	----	----	----
Thallium, total	7440-28-0	E420/VA	0.000010	mg/L		<0.000010	<0.000010	----	----	----
Thorium, total	7440-29-1	E420/VA	0.00010	mg/L		<0.00010	<0.00010	----	----	----
Tin, total	7440-31-5	E420/VA	0.00010	mg/L		<0.00010	<0.00010	----	----	----
Titanium, total	7440-32-6	E420/VA	0.00030	mg/L		<0.00030	0.00057	----	----	----
Tungsten, total	7440-33-7	E420/VA	0.00010	mg/L		<0.00010	<0.00010	----	----	----
Uranium, total	7440-61-1	E420/VA	0.000010	mg/L		0.000022	<0.000010	----	----	----
Vanadium, total	7440-62-2	E420/VA	0.00050	mg/L		<0.00050	<0.00050	----	----	----
Zinc, total	7440-66-6	E420/VA	0.0030	mg/L		<0.0030	<0.0030	----	----	----
Zirconium, total	7440-67-7	E420/VA	0.00020	mg/L		<0.00020	<0.00020	----	----	----
Hydrocarbons										
EPH (C10-C19)	----	E601A/VA	250	µg/L		<250	<250	----	----	----
EPH (C10-C32)	----	E601A/VA	400	µg/L		<400	<400	----	----	----
EPH (C19-C32)	----	E601A/VA	250	µg/L		<250	<250	----	----	----

Analytical Results

Sub-Matrix: Lake Water
(Matrix: Water)

					Client sample ID	Stocking Lake	Holland Lake	----	----	----
					Client sampling date / time	26-May-2025 08:35	26-May-2025 09:50	----	----	----
Analyte	CAS Number	Method/Lab	LOR	Unit		VA25B2291-001	VA25B2291-002	----	----	----
						Result	Result	----	----	----
Hydrocarbons										
TEH (C10-C30), BC	----	E601A/VA	250	µg/L		<250	<250	----	----	----
Hydrocarbons Surrogates										
Bromobenzotrifluoride, 2- (EPH surrogate)	392-83-6	E601A/VA	1.0	%		90.4	87.4	----	----	----
Polycyclic Aromatic Hydrocarbons										
Acenaphthene	83-32-9	E641A/VA	0.010	µg/L		<0.010	<0.010	----	----	----
Acenaphthylene	208-96-8	E641A/VA	0.010	µg/L		<0.010	<0.010	----	----	----
Acridine	260-94-6	E641A/VA	0.010	µg/L		<0.010	<0.010	----	----	----
Anthracene	120-12-7	E641A/VA	0.010	µg/L		<0.010	<0.010	----	----	----
Benz(a)anthracene	56-55-3	E641A/VA	0.010	µg/L		<0.010	<0.010	----	----	----
Benzo(a)pyrene	50-32-8	E641A/VA	0.0050	µg/L		<0.0050	<0.0050	----	----	----
Benzo(b+j)fluoranthene	n/a	E641A/VA	0.010	µg/L		<0.010	<0.010	----	----	----
Benzo(b+j+k)fluoranthene	n/a	E641A/VA	0.015	µg/L		<0.015	<0.015	----	----	----
Benzo(g,h,i)perylene	191-24-2	E641A/VA	0.010	µg/L		<0.010	<0.010	----	----	----
Benzo(k)fluoranthene	207-08-9	E641A/VA	0.010	µg/L		<0.010	<0.010	----	----	----
Chrysene	218-01-9	E641A/VA	0.010	µg/L		<0.010	<0.010	----	----	----
Dibenz(a,h)anthracene	53-70-3	E641A/VA	0.0050	µg/L		<0.0050	<0.0050	----	----	----
Fluoranthene	206-44-0	E641A/VA	0.010	µg/L		<0.010	<0.010	----	----	----
Fluorene	86-73-7	E641A/VA	0.010	µg/L		<0.010	<0.010	----	----	----
Indeno(1,2,3-c,d)pyrene	193-39-5	E641A/VA	0.010	µg/L		<0.010	<0.010	----	----	----
Methylnaphthalene, 1-	90-12-0	E641A/VA	0.010	µg/L		<0.010	<0.010	----	----	----
Methylnaphthalene, 1+2-	----	E641A/VA	0.015	µg/L		<0.015	<0.015	----	----	----

Analytical Results

Sub-Matrix: Lake Water
(Matrix: Water)

Analyte	CAS Number	Method/Lab	LOR	Unit	Client sample ID: Stocking Lake	Holland Lake	----	----	----
					Client sampling date / time: 26-May-2025 08:35	26-May-2025 09:50	----	----	----
					VA25B2291-001	VA25B2291-002	----	----	----
					Result	Result	----	----	----
Polycyclic Aromatic Hydrocarbons									
Methylnaphthalene, 2-	91-57-6	E641A/VA	0.010	µg/L	<0.010	<0.010	----	----	----
Naphthalene	91-20-3	E641A/VA	0.050	µg/L	<0.050	<0.050	----	----	----
Phenanthrene	85-01-8	E641A/VA	0.020	µg/L	<0.020	<0.020	----	----	----
Pyrene	129-00-0	E641A/VA	0.010	µg/L	<0.010	<0.010	----	----	----
Quinoline	91-22-5	E641A/VA	0.050	µg/L	<0.050	<0.050	----	----	----
B(a)P total potency equivalents [B(a)P TPE]	----	E641A/VA	0.010	µg/L	<0.010	<0.010	----	----	----
PAHs, high molecular weight (BC AWQ)	n/a	E641A/VA	0.030	µg/L	<0.030	<0.030	----	----	----
PAHs, low molecular weight (BC AWQ)	n/a	E641A/VA	0.060	µg/L	<0.060	<0.060	----	----	----
PAHs, total (EPA 16)	n/a	E641A/VA	0.065	µg/L	<0.065	<0.065	----	----	----
Polycyclic Aromatic Hydrocarbons Surrogates									
Chrysene-d12	1719-03-5	E641A/VA	0.1	%	104	103	----	----	----
Naphthalene-d8	1146-65-2	E641A/VA	0.1	%	91.1	92.2	----	----	----
Phenanthrene-d10	1517-22-2	E641A/VA	0.1	%	100	100	----	----	----

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

ALS Canada Ltd.

right solutions.
right partner.

QUALITY CONTROL INTERPRETIVE REPORT

Work Order	: **VA25B2291**	Page	: 1 of 11
Client	: **Town of Ladysmith**	Laboratory	: ALS Environmental - Vancouver
Contact	: Shawn Baker	Account Manager	: Kevin Bhikadia
Address	: 410 Esplanade PO Box 220 Ladysmith BC Canada V9G 1A2	Address	: 8081 Lougheed Highway Burnaby, British Columbia Canada V5A 1W9
Telephone	: ----	Telephone	: +1 604 253 4188
Project	: Arbutus Water Treatment Plant - Quarterly Lake Sampling	Date Samples Received	: 27-May-2025 11:00
PO	: 10940	Issue Date	: 03-Jun-2025 10:59
C-O-C number	: ----		
Sampler	: ----		
Site	: RFP Tender No. 2022-IS-20 Extension		
Quote number	: Town of Ladysmith Standing Offer_V2		
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 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

- Quality Control Sample Frequency Outliers occur - please see following pages for full details.

CERTIFICATE OF ANALYSIS

Work Order	:	**VA25B2407**			
Client	:	**Town of Ladysmith**	Laboratory	:	ALS Environmental - Vancouver
Contact	:	Shawn Baker	Account Manager	:	Kevin Bhikadia
Address	:	410 Esplanade PO Box 220 Ladysmith British Columbia Canada V9G 1A2	Address	:	8081 Lougheed Highway Burnaby BC Canada V5A 1W9
Telephone	:	----	E-mail	:	Kevin.Bhikadia@alsglobal.com
Project	:	Arbutus Water Treatment Plant - Weekly Sampling	Telephone	:	+1 604 253 4188
PO	:	10940	Date Samples Received	:	28-May-2025 12:25
C-O-C number	:	----	Date Analysis Commenced	:	28-May-2025
Sampler	:	----	Issue Date	:	02-Jun-2025 12:22
Site	:	Town of Ladysmith			
Quote number	:	Town of Ladysmith Standing Offer			
No. of samples received	:	4			
No. of samples analysed	:	4			

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

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results

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

Signatories

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

Signatories	*Position*	*Laboratory Department*
Anita Chuang	Lab Assistant	Inorganics, Burnaby, British Columbia
Lindsay Gung	Department Manager - Inorganics	Inorganics, Burnaby, British Columbia
Lindsay Gung	Department Manager - Inorganics	Microbiology, Burnaby, British Columbia

General Comments

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

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

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

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

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

Unit	*Description*
-	no units
CFU/mL	colony forming units per millilitre
CU	colour units (1 cu = 1 mg/l pt)
mg/L	milligrams per litre
MPN/100mL	most probable number per hundred millilitres
NTU	nephelometric turbidity units
pH units	pH units
µS/cm	microsiemens per centimetre

<: 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.

Workorder Comments

Sample(s) 004: Exceeded Recommended Holding Time prior to receipt at the lab for HPC analysis.

Analytical Results

Sub-Matrix: Water
(Matrix: Water)

Analyte	CAS Number	Method/Lab	LOR	Unit	Raw Water	DAF Effluent	UF Effluent	Treated Water (post reservoir)	----
Client sample ID									
Client sampling date / time					27-May-2025 10:30	27-May-2025 10:30	27-May-2025 10:30	27-May-2025 10:30	----
					VA25B2407-001	VA25B2407-002	VA25B2407-003	VA25B2407-004	----
					Result	Result	Result	Result	----
Sample Preparation									
Dissolved carbon filtration location	----	EP358/VA	-	-	lab	lab	lab	----	----
Physical Tests									
Alkalinity, total (as CaCO3)	----	E290/VA	1.0	mg/L	----	----	----	12.9	----
Colour, true	----	E329/VA	5.0	CU	----	----	----	<5.0	----
Conductivity	----	E100/VA	2.0	µS/cm	----	----	----	55.8	----
pH	----	E108/VA	0.10	pH units	----	----	----	7.13	----
Turbidity	----	E121/VA	0.10	NTU	----	----	----	<0.10	----
Organic / Inorganic Carbon									
Carbon, dissolved organic [DOC]	----	E358-L/VA	0.50	mg/L	2.19	0.88	0.79	----	----
Carbon, total organic [TOC]	----	E355-L/VA	0.50	mg/L	2.42	1.12	0.75	----	----
Microbiological Tests									
Heterotrophic plate count [HPC]	----	E020/VA	1	CFU/mL	----	----	----	<1	----
Coliforms, Escherichia coli [E. coli]	----	E010/VA	1	MPN/100 mL	----	----	----	<1	----
Coliforms, total	----	E010/VA	1	MPN/100 mL	----	----	----	<1	----

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

ALS Canada Ltd.

right solutions.
right partner.

QUALITY CONTROL INTERPRETIVE REPORT

Work Order	: **VA25B2407**	Page	: 1 of 7
Client	: **Town of Ladysmith**	Laboratory	: ALS Environmental - Vancouver
Contact	: Shawn Baker	Account Manager	: Kevin Bhikadia
Address	: 410 Esplanade PO Box 220 Ladysmith BC Canada V9G 1A2	Address	: 8081 Lougheed Highway Burnaby, British Columbia Canada V5A 1W9
Telephone	: ----	Telephone	: +1 604 253 4188
Project	: Arbutus Water Treatment Plant - Weekly Sampling	Date Samples Received	: 28-May-2025 12:25
PO	: 10940	Issue Date	: 02-Jun-2025 12:21
C-O-C number	: ----		
Sampler	: ----		
Site	: Town of Ladysmith		
Quote number	: Town of Ladysmith Standing Offer_V2		
No. of samples received	: 4		
No. of samples analysed	: 4		

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.