

## CERTIFICATE OF ANALYSIS

**REPORTED TO** Mid Shuswap Lumby Water Stewards  
1631 Mable Lake Rd  
Lumby, BC V0E 2G6

**ATTENTION** Russ Collins

**PO NUMBER** Mid Shuswap Lumby Water Stewards  
**PROJECT** Analytical Testing

**PROJECT INFO**

**WORK ORDER** 22K1526

**RECEIVED / TEMP** 2022-11-14 08:56 / 2.2°C  
**REPORTED** 2022-11-21 10:34

**COC NUMBER** 40837.5581

### Introduction:

CARO Analytical Services is a testing laboratory full of smart, engaged scientists driven to make the world a safer and healthier place. Through our clients' projects we become an essential element for a better world. We employ methods conducted in accordance with recognized professional standards using accepted testing methodologies and quality control efforts. CARO is accredited by the Canadian Association for Laboratories Accreditation (CALA) to ISO/IEC 17025:2017 for specific tests listed in the scope of accreditation approved by CALA.

#### *Big Picture Sidekicks*



You know that the sample you collected after snowshoeing to site, digging 5 meters, and racing to get it on a plane so you can submit it to the lab for time sensitive results needed to make important and expensive decisions (whew) is VERY important. We know that too.

#### *We've Got Chemistry*



It's simple. We figure the more you enjoy working with our fun and engaged team members; the more likely you are to give us continued opportunities to support you.

#### *Ahead of the Curve*



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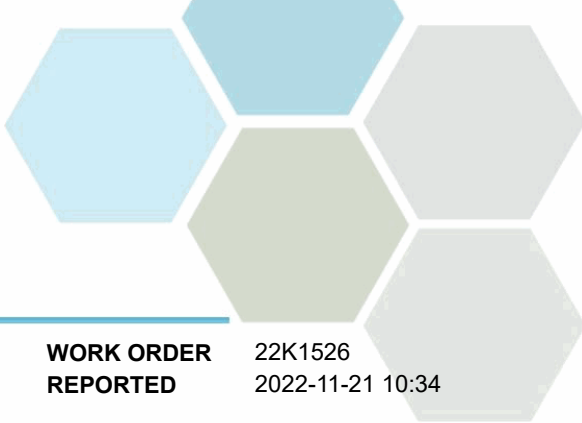
If you have any questions or concerns, please contact me at [TeamCaro@caro.ca](mailto:TeamCaro@caro.ca)

### Authorized By:

Team CARO  
Client Service Representative

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# TEST RESULTS

**REPORTED TO PROJECT** Mid Shuswap Lumby Water Stewards Analytical Testing

**WORK ORDER REPORTED** 22K1526  
2022-11-21 10:34

Analyte	Result	Guideline	RL	Units	Analyzed	Qualifier
<b>Harris Creek (Hwy 6) (22K1526-01)   Matrix: Water   Sampled: 2022-11-13 11:05</b>						<b>FILT, PRES</b>

**Anions**

Chloride	<b>3.09</b>	AO ≤ 250	0.10	mg/L	2022-11-14	
Nitrate (as N)	<b>0.031</b>	MAC = 10	0.010	mg/L	2022-11-14	
Nitrite (as N)	< 0.010	MAC = 1	0.010	mg/L	2022-11-14	
Sulfate	<b>24.8</b>	AO ≤ 500	1.0	mg/L	2022-11-14	

**Calculated Parameters**

Nitrate+Nitrite (as N)	<b>0.0310</b>	N/A	0.0100	mg/L	N/A	
Nitrogen, Total	<b>0.224</b>	N/A	0.0500	mg/L	N/A	

**General Parameters**

Ammonia, Total (as N)	< 0.050	None Required	0.050	mg/L	2022-11-14	
Conductivity (EC)	<b>291</b>	N/A	2.0	µS/cm	2022-11-16	
Nitrogen, Total Kjeldahl	<b>0.193</b>	N/A	0.050	mg/L	2022-11-18	
pH	<b>7.75</b>	7.0-10.5	0.10	pH units	2022-11-16	HT2
Phosphorus, Total (as P)	<b>0.0228</b>	N/A	0.0050	mg/L	2022-11-17	
Phosphorus, Total Dissolved	<b>0.0184</b>	N/A	0.0050	mg/L	2022-11-17	
Turbidity	<b>0.46</b>	OG < 1	0.10	NTU	2022-11-14	

**Microbiological Parameters**

Coliforms, Total (Q-Tray)	<b>390</b>	MAC = 0	1	MPN/100 mL	2022-11-14	
Coliforms, Fecal (Q-Tray)	<b>42</b>	N/A	1	MPN/100 mL	2022-11-14	
E. coli (Q-Tray)	<b>23</b>	MAC = 0	1	MPN/100 mL	2022-11-14	

**Duteau Creek (HWY 6) (22K1526-02) | Matrix: Water | Sampled: 2022-11-13 11:00**

**FILT, PRES**

**Anions**

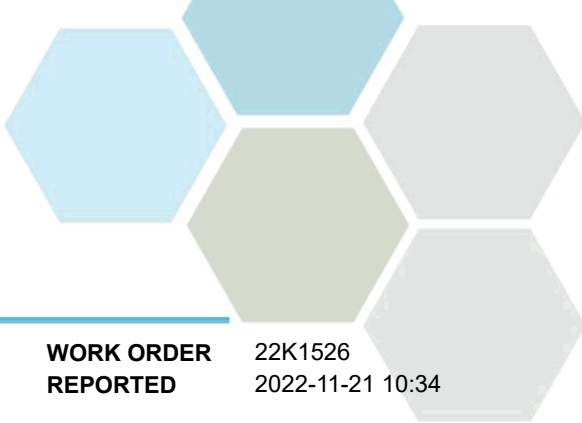
Chloride	<b>7.52</b>	AO ≤ 250	0.10	mg/L	2022-11-14	
Nitrate (as N)	<b>0.510</b>	MAC = 10	0.010	mg/L	2022-11-14	
Nitrite (as N)	< 0.010	MAC = 1	0.010	mg/L	2022-11-14	
Sulfate	<b>22.1</b>	AO ≤ 500	1.0	mg/L	2022-11-14	

**Calculated Parameters**

Nitrate+Nitrite (as N)	<b>0.510</b>	N/A	0.0100	mg/L	N/A	
Nitrogen, Total	<b>0.838</b>	N/A	0.0500	mg/L	N/A	

**General Parameters**

Ammonia, Total (as N)	< 0.050	None Required	0.050	mg/L	2022-11-14	
Conductivity (EC)	<b>238</b>	N/A	2.0	µS/cm	2022-11-17	
Nitrogen, Total Kjeldahl	<b>0.328</b>	N/A	0.050	mg/L	2022-11-18	
pH	<b>7.22</b>	7.0-10.5	0.10	pH units	2022-11-17	HT2
Phosphorus, Total (as P)	<b>0.0257</b>	N/A	0.0050	mg/L	2022-11-17	
Phosphorus, Total Dissolved	<b>0.0136</b>	N/A	0.0050	mg/L	2022-11-17	
Turbidity	<b>2.58</b>	OG < 1	0.10	NTU	2022-11-14	



# TEST RESULTS

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**WORK ORDER REPORTED** 22K1526  
2022-11-21 10:34

Analyte	Result	Guideline	RL	Units	Analyzed	Qualifier
<b>Duteau Creek (HWY 6) (22K1526-02)   Matrix: Water   Sampled: 2022-11-13 11:00, Continued</b>						FILT, PRES

**Microbiological Parameters**

Coliforms, Total (Q-Tray)	324	MAC = 0	1	MPN/100 mL	2022-11-14	
Coliforms, Fecal (Q-Tray)	47	N/A	1	MPN/100 mL	2022-11-14	
E. coli (Q-Tray)	19	MAC = 0	1	MPN/100 mL	2022-11-14	

**Mid Bessette Creek (22K1526-03) | Matrix: Water | Sampled: 2022-11-13 10:30**

FILT, PRES

**Anions**

Chloride	9.85	AO ≤ 250	0.10	mg/L	2022-11-14	
Nitrate (as N)	0.384	MAC = 10	0.010	mg/L	2022-11-14	
Nitrite (as N)	< 0.010	MAC = 1	0.010	mg/L	2022-11-14	
Sulfate	32.8	AO ≤ 500	1.0	mg/L	2022-11-14	

**Calculated Parameters**

Nitrate+Nitrite (as N)	0.384	N/A	0.0100	mg/L	N/A	
Nitrogen, Total	0.723	N/A	0.0500	mg/L	N/A	

**General Parameters**

Ammonia, Total (as N)	0.130	None Required	0.050	mg/L	2022-11-14	
Conductivity (EC)	344	N/A	2.0	µS/cm	2022-11-16	
Nitrogen, Total Kjeldahl	0.339	N/A	0.050	mg/L	2022-11-18	
pH	7.83	7.0-10.5	0.10	pH units	2022-11-16	HT2
Phosphorus, Total (as P)	0.0462	N/A	0.0050	mg/L	2022-11-17	
Phosphorus, Total Dissolved	0.0437	N/A	0.0050	mg/L	2022-11-17	
Turbidity	1.33	OG < 1	0.10	NTU	2022-11-14	

**Microbiological Parameters**

Coliforms, Total (Q-Tray)	649	MAC = 0	1	MPN/100 mL	2022-11-14	
Coliforms, Fecal (Q-Tray)	105	N/A	1	MPN/100 mL	2022-11-14	
E. coli (Q-Tray)	93	MAC = 0	1	MPN/100 mL	2022-11-14	

**Lower Bessette Creek (22K1526-04) | Matrix: Water | Sampled: 2022-11-13 10:10**

FILT, PRES

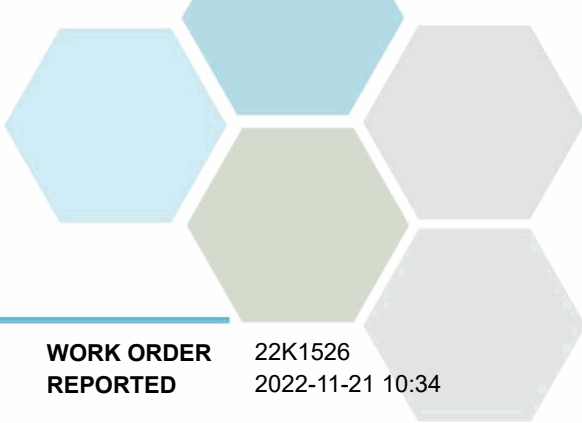
**Anions**

Chloride	10.5	AO ≤ 250	0.10	mg/L	2022-11-14	
Nitrate (as N)	0.406	MAC = 10	0.010	mg/L	2022-11-14	
Nitrite (as N)	< 0.010	MAC = 1	0.010	mg/L	2022-11-14	
Sulfate	37.9	AO ≤ 500	1.0	mg/L	2022-11-14	

**Calculated Parameters**

Nitrate+Nitrite (as N)	0.406	N/A	0.0100	mg/L	N/A	
Nitrogen, Total	0.759	N/A	0.0500	mg/L	N/A	

**General Parameters**



# TEST RESULTS

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**WORK ORDER REPORTED** 22K1526  
2022-11-21 10:34

Analyte	Result	Guideline	RL	Units	Analyzed	Qualifier
<b>Lower Bessette Creek (22K1526-04)   Matrix: Water   Sampled: 2022-11-13 10:10, Continued</b>						<b>FILT, PRES</b>

**General Parameters, Continued**

Ammonia, Total (as N)	0.116	None Required	0.050	mg/L	2022-11-14	
Conductivity (EC)	374	N/A	2.0	µS/cm	2022-11-16	
Nitrogen, Total Kjeldahl	0.353	N/A	0.050	mg/L	2022-11-18	
pH	8.15	7.0-10.5	0.10	pH units	2022-11-16	HT2
Phosphorus, Total (as P)	0.0472	N/A	0.0050	mg/L	2022-11-17	
Phosphorus, Total Dissolved	0.0373	N/A	0.0050	mg/L	2022-11-17	
Turbidity	2.88	OG < 1	0.10	NTU	2022-11-14	

**Microbiological Parameters**

Coliforms, Total (Q-Tray)	1050	MAC = 0	1	MPN/100 mL	2022-11-14	
Coliforms, Fecal (Q-Tray)	66	N/A	1	MPN/100 mL	2022-11-14	
E. coli (Q-Tray)	66	MAC = 0	1	MPN/100 mL	2022-11-14	

**Shuswap River (Wilsey Dam) (22K1526-05) | Matrix: Water | Sampled: 2022-11-13**

**FILT, PRES**

**Anions**

Chloride	0.49	AO ≤ 250	0.10	mg/L	2022-11-14	
Nitrate (as N)	0.043	MAC = 10	0.010	mg/L	2022-11-14	
Nitrite (as N)	< 0.010	MAC = 1	0.010	mg/L	2022-11-14	
Sulfate	7.1	AO ≤ 500	1.0	mg/L	2022-11-14	

**Calculated Parameters**

Nitrate+Nitrite (as N)	0.0432	N/A	0.0100	mg/L	N/A	
Nitrogen, Total	0.170	N/A	0.0500	mg/L	N/A	

**General Parameters**

Ammonia, Total (as N)	< 0.050	None Required	0.050	mg/L	2022-11-14	
Conductivity (EC)	113	N/A	2.0	µS/cm	2022-11-16	
Nitrogen, Total Kjeldahl	0.127	N/A	0.050	mg/L	2022-11-18	
pH	7.86	7.0-10.5	0.10	pH units	2022-11-16	HT2
Phosphorus, Total (as P)	0.0072	N/A	0.0050	mg/L	2022-11-17	
Phosphorus, Total Dissolved	< 0.0050	N/A	0.0050	mg/L	2022-11-17	
Turbidity	0.48	OG < 1	0.10	NTU	2022-11-14	

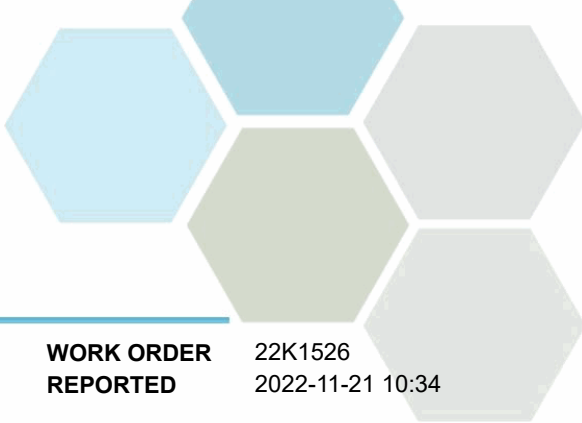
**Microbiological Parameters**

Coliforms, Total (Q-Tray)	167	MAC = 0	1	MPN/100 mL	2022-11-14	
Coliforms, Fecal (Q-Tray)	3	N/A	1	MPN/100 mL	2022-11-14	
E. coli (Q-Tray)	2	MAC = 0	1	MPN/100 mL	2022-11-14	

**Shuswap River (Odd Fellows) (22K1526-06) | Matrix: Water | Sampled: 2022-11-13 09:20**

**FILT, PRES**

**Anions**



# TEST RESULTS

**REPORTED TO PROJECT** Mid Shuswap Lumby Water Stewards Analytical Testing

**WORK ORDER REPORTED** 22K1526  
2022-11-21 10:34

Analyte	Result	Guideline	RL Units	Analyzed	Qualifier
<b>Shuswap River (Odd Fellows) (22K1526-06)   Matrix: Water   Sampled: 2022-11-13 09:20, Continued</b>					<b>FILT, PRES</b>

**Anions, Continued**

Chloride	<b>0.93</b>	AO ≤ 250	0.10 mg/L	2022-11-14	
Nitrate (as N)	<b>0.044</b>	MAC = 10	0.010 mg/L	2022-11-14	
Nitrite (as N)	< 0.010	MAC = 1	0.010 mg/L	2022-11-14	
Sulfate	<b>9.1</b>	AO ≤ 500	1.0 mg/L	2022-11-14	

**Calculated Parameters**

Nitrate+Nitrite (as N)	<b>0.0436</b>	N/A	0.0100 mg/L	N/A	
Nitrogen, Total	<b>0.122</b>	N/A	0.0500 mg/L	N/A	

**General Parameters**

Ammonia, Total (as N)	< 0.050	None Required	0.050 mg/L	2022-11-14	
Conductivity (EC)	<b>133</b>	N/A	2.0 µS/cm	2022-11-16	
Nitrogen, Total Kjeldahl	<b>0.078</b>	N/A	0.050 mg/L	2022-11-18	
pH	<b>7.75</b>	7.0-10.5	0.10 pH units	2022-11-16	HT2
Phosphorus, Total (as P)	<b>0.0080</b>	N/A	0.0050 mg/L	2022-11-17	
Phosphorus, Total Dissolved	<b>0.0058</b>	N/A	0.0050 mg/L	2022-11-17	
Turbidity	<b>0.49</b>	OG < 1	0.10 NTU	2022-11-14	

**Microbiological Parameters**

Coliforms, Total (Q-Tray)	<b>178</b>	MAC = 0	1 MPN/100 mL	2022-11-14	
Coliforms, Fecal (Q-Tray)	<b>4</b>	N/A	1 MPN/100 mL	2022-11-14	
E. coli (Q-Tray)	<b>4</b>	MAC = 0	1 MPN/100 mL	2022-11-14	

**Vance Creek (Mabel Lake Rd) (22K1526-07) | Matrix: Water | Sampled: 2022-11-13 10:45**

**FILT, PRES**

**Anions**

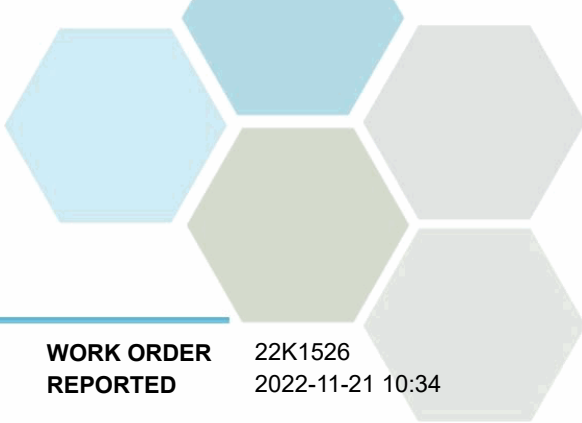
Chloride	<b>4.31</b>	AO ≤ 250	0.10 mg/L	2022-11-14	
Nitrate (as N)	<b>0.031</b>	MAC = 10	0.010 mg/L	2022-11-14	
Nitrite (as N)	< 0.010	MAC = 1	0.010 mg/L	2022-11-14	
Sulfate	<b>39.5</b>	AO ≤ 500	1.0 mg/L	2022-11-14	

**Calculated Parameters**

Nitrate+Nitrite (as N)	<b>0.0308</b>	N/A	0.0100 mg/L	N/A	
Nitrogen, Total	< 0.0500	N/A	0.0500 mg/L	N/A	

**General Parameters**

Ammonia, Total (as N)	< 0.050	None Required	0.050 mg/L	2022-11-14	
Conductivity (EC)	<b>421</b>	N/A	2.0 µS/cm	2022-11-16	
Nitrogen, Total Kjeldahl	< 0.050	N/A	0.050 mg/L	2022-11-18	
pH	<b>8.29</b>	7.0-10.5	0.10 pH units	2022-11-16	HT2
Phosphorus, Total (as P)	<b>0.0063</b>	N/A	0.0050 mg/L	2022-11-17	
Phosphorus, Total Dissolved	< 0.0050	N/A	0.0050 mg/L	2022-11-17	
Turbidity	<b>0.10</b>	OG < 1	0.10 NTU	2022-11-14	



## TEST RESULTS

**REPORTED TO PROJECT** Mid Shuswap Lumby Water Stewards  
Analytical Testing

**WORK ORDER REPORTED** 22K1526  
2022-11-21 10:34

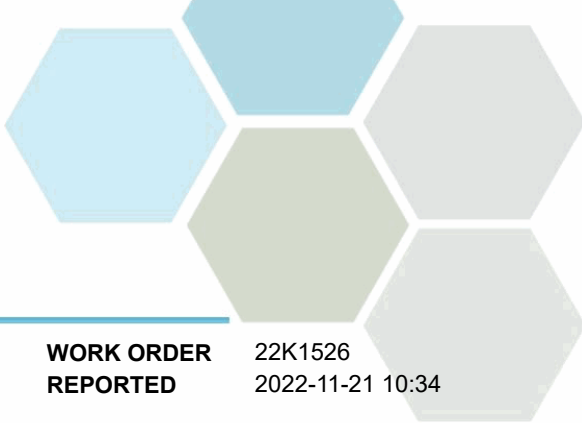
Analyte	Result	Guideline	RL	Units	Analyzed	Qualifier
<b>Vance Creek (Mabel Lake Rd) (22K1526-07)   Matrix: Water   Sampled: 2022-11-13 10:45, Continued</b>						FILT, PRES

**Microbiological Parameters**

Coliforms, Total (Q-Tray)	131	MAC = 0	1	MPN/100 mL	2022-11-14	
Coliforms, Fecal (Q-Tray)	1	N/A	1	MPN/100 mL	2022-11-14	
E. coli (Q-Tray)	1	MAC = 0	1	MPN/100 mL	2022-11-14	

**Sample Qualifiers:**

FILT The sample has been filtered for TDP in the laboratory. Results may not reflect conditions at the time of sampling.  
 HT2 The 15 minute recommended holding time (from sampling to analysis) has been exceeded - field analysis is recommended.  
 PRES Sample has been preserved for TDP in the laboratory and the holding time has been extended.



## APPENDIX 1: SUPPORTING INFORMATION

**REPORTED TO PROJECT** Mid Shuswap Lumby Water Stewards  
Analytical Testing

**WORK ORDER REPORTED** 22K1526  
2022-11-21 10:34

Analysis Description	Method Ref.	Technique	Accredited	Location
Ammonia, Total in Water	SM 4500-NH3 G* (2017)	Automated Colorimetry (Phenate)	✓	Kelowna
Anions in Water	SM 4110 B (2017)	Ion Chromatography	✓	Kelowna
Coliforms, Fecal in Water	NA / SM 9223 (2017)	Quanti-Tray / Enzyme Substrate Endo Agar	✓	Kelowna
Coliforms, Total in Water	NA / SM 9223 (2017)	Quanti-Tray / Enzyme Substrate Endo Agar	✓	Kelowna
Conductivity in Water	SM 2510 B (2017)	Conductivity Meter	✓	Kelowna
E. coli in Water	NA / SM 9223 (2017)	Quanti-Tray / Enzyme Substrate Endo Agar	✓	Kelowna
Nitrogen, Total Kjeldahl in Water	SM 4500-Norg D* (2017)	Block Digestion and Flow Injection Analysis	✓	Kelowna
pH in Water	SM 4500-H+ B (2017)	Electrometry	✓	Kelowna
Phosphorus, Total Dissolved in Water	SM 4500-P B.5* (2011) / SM 4500-P F (2017)	Persulfate Digestion / Automated Colorimetry (Ascorbic Acid)	✓	Kelowna
Phosphorus, Total in Water	SM 4500-P B.5* (2011) / SM 4500-P F (2017)	Persulfate Digestion / Automated Colorimetry (Ascorbic Acid)	✓	Kelowna
Turbidity in Water	SM 2130 B (2017)	Nephelometry	✓	Kelowna

*Note: An asterisk in the Method Reference indicates that the CARO method has been modified from the reference method*

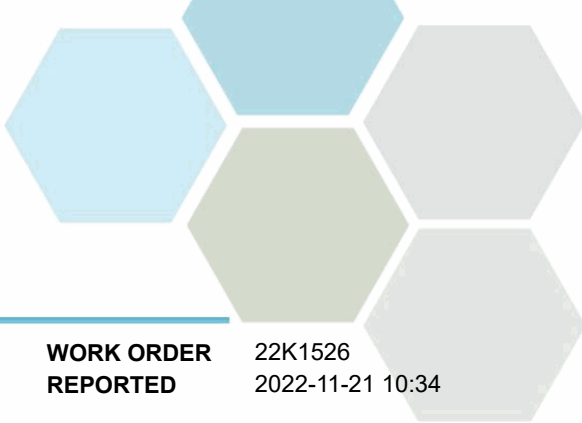
### Glossary of Terms:

RL	Reporting Limit (default)
<	Less than the specified Reporting Limit (RL) - the actual RL may be higher than the default RL due to various factors
AO	Aesthetic Objective
MAC	Maximum Acceptable Concentration (health based)
mg/L	Milligrams per litre
MPN/100 mL	Most Probable Number per 100 millilitres
NTU	Nephelometric Turbidity Units
OG	Operational Guideline (treated water)
pH units	pH < 7 = acidic, pH > 7 = basic
µS/cm	Microsiemens per centimetre
SM	Standard Methods for the Examination of Water and Wastewater, American Public Health Association

### Guidelines Referenced in this Report:

[Guidelines for Canadian Drinking Water Quality \(Health Canada, June 2019\)](#)

*Note: In some cases, the values displayed on the report represent the lowest guideline and are to be verified by the end user*



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Analytical Testing

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**General Comments:**

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Results in **Bold** indicate values that are above CARO's method reporting limits. Any results that are above regulatory limits are highlighted **red**. Please note that results will only be highlighted red if the regulatory limits are included on the CARO report. Any Bold and/or highlighted results do not take into account method uncertainty. If you would like method uncertainty or regulatory limits to be included on your report, please contact your Account Manager: [TeamCaro@caro.ca](mailto:TeamCaro@caro.ca)

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