

REPORTED TO	Mid Shuswap Lumby Water Stewards 1631 Mable Lake Rd Lumby, BC V0E 2G6	TEL	(250) 547-2554
		FAX	-
ATTENTION	Russ Collins	WORK ORDER	6110943
PO NUMBER	Mid Shuswap Lumby Water Stewards	RECEIVED / TEMP	2016-11-14 09:00 / 6°C
PROJECT	Analytical Testing	REPORTED	2016-11-21
PROJECT INFO		COC NUMBER	No Number

General Comments:

CARO Analytical Services employs methods which are conducted according to procedures accepted by appropriate regulatory agencies, and/or are conducted in accordance with recognized professional standards using accepted testing methodologies and quality control efforts, except where otherwise agreed to by the client.

The results in this report apply to the samples analyzed in accordance with the Chain of Custody or Sample Requisition document. This analytical report must be reproduced in its entirety. CARO is not responsible for any loss or damage resulting directly or indirectly from error or omission in the conduct of testing. Liability is limited to the cost of analysis. Samples will be disposed of 30 days after the test report has been issued unless otherwise agreed to in writing.



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REPORTED TO PROJECT Mid Shuswap Lumby Water Stewards
Analytical Testing

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Analysis Description	Method Reference	Technique	Location
Anions by IC in Water	APHA 4110 B	Ion Chromatography with Chemical Suppression of Eluent Conductivity	Kelowna
Coliforms, Total (MF-Endo) in Water	APHA 9222 B	Membrane Filtration / Incubation on m-Endo Agar	Kelowna
Conductivity in Water	APHA 2510 B	Conductivity Meter	Kelowna
E. coli (MF-NA+MUG) in Water	APHA 9222 G	Membrane Filtration / Nutrient Agar with MUG	Kelowna
Nitrogen, Total Kjeldahl in Water	APHA 4500-Norg D*	Block Digestion and Flow Injection Analysis	Kelowna
pH in Water	APHA 4500-H+ B	Electrometry	Kelowna
Phosphorus, Total by Colorimetry in Water	APHA 4500-P B.5* / APHA 4500-P F	Persulfate Digestion / Automated Colorimetry (Ascorbic Acid)	Kelowna
Phosphorus, Total Dissolved by Colorimetry in Water	APHA 4500-P B.5* / APHA 4500-P F	Persulfate Digestion / Automated Colorimetry (Ascorbic Acid)	Kelowna
Turbidity in Water	APHA 2130 B	Nephelometry	Kelowna

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

Method Reference Descriptions:

APHA Standard Methods for the Examination of Water and Wastewater, 22nd Edition, American Public Health Association/American Water Works Association/Water Environment Federation

Glossary of Terms:

MRL Method Reporting Limit
 < Less than the Reported Detection Limit (RDL) - the RDL may be higher than the MRL due to various factors such as dilutions, limited sample volume, high moisture, or interferences
 AO Aesthetic objective
 MAC Maximum acceptable concentration (health based)
 OG Operational guideline (treated water)
 CFU/100 mL Colony Forming Units per 100 millilitres
 mg/L Milligrams per litre
 NTU Nephelometric Turbidity Units
 pH units pH < 7 = acidic, pH > 7 = basic
 µS/cm Microsiemens per centimetre

Standards / Guidelines Referenced in this Report:

Guidelines for Canadian Drinking Water Quality (Oct 2014)

Website: http://www.hc-sc.gc.ca/ewh-semt/alt_formats/pdf/pubs/water-eau/sum_guide-res_recom/sum_guide-res_recom-eng.pdf

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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Analyte	Result / Recovery	Standard / Guideline	MRL / Limits	Units	Prepared	Analyzed	Notes
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Sample ID: Harris Creek (Hwy 6) (6110943-01) [Water] Sampled: 2016-11-13 10:00

FILT,
PRESa

General Parameters

Conductivity (EC)	93	N/A	2	µS/cm	N/A	2016-11-16	
Nitrogen, Total Kjeldahl	0.22	N/A	0.05	mg/L	2016-11-16	2016-11-18	
pH	7.46	6.5-8.5	0.01	pH units	N/A	2016-11-16	HT2
Phosphorus, Total (as P)	0.017	N/A	0.002	mg/L	2016-11-21	2016-11-21	
Phosphorus, Total Dissolved	0.012	N/A	0.002	mg/L	2016-11-21	2016-11-21	
Turbidity	1.80	OG < 0.1	0.10	NTU	N/A	2016-11-14	

Microbiological Parameters

Coliforms, Total	120	MAC = None Detected	1	CFU/100 mL	N/A	2016-11-14	
Background Colonies	> 200	N/A	200	CFU/100 mL	N/A	2016-11-14	
E. coli	10	MAC = None Detected	1	CFU/100 mL	N/A	2016-11-14	

Sample ID: Duteau Creek - Hwy 6 Bridge (6110943-02) [Water] Sampled: 2016-11-13 10:00

FILT,
PRESa

Anions

Chloride	5.78	AO ≤ 250	0.10	mg/L	N/A	2016-11-16	
Nitrate (as N)	0.186	MAC = 10	0.010	mg/L	N/A	2016-11-16	
Nitrite (as N)	< 0.010	MAC = 1	0.010	mg/L	N/A	2016-11-16	
Sulfate	14.5	AO ≤ 500	1.0	mg/L	N/A	2016-11-16	

General Parameters

Conductivity (EC)	204	N/A	2	µS/cm	N/A	2016-11-16	
Nitrogen, Total Kjeldahl	0.26	N/A	0.05	mg/L	2016-11-16	2016-11-18	
pH	7.71	6.5-8.5	0.01	pH units	N/A	2016-11-16	HT2
Phosphorus, Total (as P)	0.018	N/A	0.002	mg/L	2016-11-21	2016-11-21	
Phosphorus, Total Dissolved	0.014	N/A	0.002	mg/L	2016-11-21	2016-11-21	
Turbidity	1.14	OG < 0.1	0.10	NTU	N/A	2016-11-14	

Calculated Parameters

Nitrate+Nitrite (as N)	0.186	N/A	0.010	mg/L	N/A	N/A	
Nitrogen, Total	0.442	N/A	0.050	mg/L	N/A	N/A	

Microbiological Parameters

Coliforms, Total	≥ 200	MAC = None Detected	1	CFU/100 mL	N/A	2016-11-14	
Background Colonies	> 200	N/A	200	CFU/100 mL	N/A	2016-11-14	
E. coli	19	MAC = None Detected	1	CFU/100 mL	N/A	2016-11-14	

Sample ID: Mid Bessette Creek (6110943-03) [Water] Sampled: 2016-11-13 09:37

FILT,
PRESa

Anions

Chloride	3.04	AO ≤ 250	0.10	mg/L	N/A	2016-11-16	
Nitrate (as N)	0.068	MAC = 10	0.010	mg/L	N/A	2016-11-16	

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Sample ID: Mid Bessette Creek (6110943-03) [Water] Sampled: 2016-11-13 09:37, Continued

FILT,
PRESa

Anions, Continued

Nitrite (as N)	< 0.010	MAC = 1	0.010	mg/L	N/A	2016-11-16	
Sulfate	12.7	AO ≤ 500	1.0	mg/L	N/A	2016-11-16	

General Parameters

Conductivity (EC)	154	N/A	2	µS/cm	N/A	2016-11-16	
Nitrogen, Total Kjeldahl	0.23	N/A	0.05	mg/L	2016-11-16	2016-11-18	
pH	7.66	6.5-8.5	0.01	pH units	N/A	2016-11-16	HT2
Phosphorus, Total (as P)	0.027	N/A	0.002	mg/L	2016-11-21	2016-11-21	
Phosphorus, Total Dissolved	0.017	N/A	0.002	mg/L	2016-11-21	2016-11-21	
Turbidity	2.53	OG < 0.1	0.10	NTU	N/A	2016-11-14	

Calculated Parameters

Nitrate+Nitrite (as N)	0.068	N/A	0.010	mg/L	N/A	N/A	
Nitrogen, Total	0.294	N/A	0.050	mg/L	N/A	N/A	

Microbiological Parameters

Coliforms, Total	330	MAC = None Detected	1	CFU/100 mL	N/A	2016-11-14	
Background Colonies	> 200	N/A	200	CFU/100 mL	N/A	2016-11-14	
E. coli	18	MAC = None Detected	1	CFU/100 mL	N/A	2016-11-14	

Sample ID: Lower Bessette Creek (6110943-04) [Water] Sampled: 2016-11-13 09:22

FILT,
PRESb

Anions

Chloride	2.93	AO ≤ 250	0.10	mg/L	N/A	2016-11-16	
Nitrate (as N)	0.068	MAC = 10	0.010	mg/L	N/A	2016-11-16	
Nitrite (as N)	< 0.010	MAC = 1	0.010	mg/L	N/A	2016-11-16	
Sulfate	13.8	AO ≤ 500	1.0	mg/L	N/A	2016-11-16	

General Parameters

Conductivity (EC)	159	N/A	2	µS/cm	N/A	2016-11-16	
Nitrogen, Total Kjeldahl	0.23	N/A	0.05	mg/L	2016-11-16	2016-11-18	
pH	7.71	6.5-8.5	0.01	pH units	N/A	2016-11-16	HT2
Phosphorus, Total (as P)	0.028	N/A	0.002	mg/L	2016-11-21	2016-11-21	
Phosphorus, Total Dissolved	0.018	N/A	0.002	mg/L	2016-11-21	2016-11-21	
Turbidity	2.66	OG < 0.1	0.10	NTU	N/A	2016-11-14	

Calculated Parameters

Nitrate+Nitrite (as N)	0.068	N/A	0.010	mg/L	N/A	N/A	
Nitrogen, Total	0.300	N/A	0.050	mg/L	N/A	N/A	

Microbiological Parameters

Coliforms, Total	440	MAC = None Detected	1	CFU/100 mL	N/A	2016-11-14	
Background Colonies	> 200	N/A	200	CFU/100 mL	N/A	2016-11-14	

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Sample ID: Lower Bessette Creek (6110943-04) [Water] Sampled: 2016-11-13 09:22, Continued

FILT,
PRESb

Microbiological Parameters, Continued

E. coli	30	MAC = None Detected	1	CFU/100 mL	N/A	2016-11-14	
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Sample ID: Shuswap River (Odd Fellows) (6110943-05) [Water] Sampled: 2016-11-13 08:45

FILT,
PRESa

Anions

Chloride	0.62	AO ≤ 250	0.10	mg/L	N/A	2016-11-16	
Nitrate (as N)	0.040	MAC = 10	0.010	mg/L	N/A	2016-11-16	
Nitrite (as N)	< 0.010	MAC = 1	0.010	mg/L	N/A	2016-11-16	
Sulfate	5.2	AO ≤ 500	1.0	mg/L	N/A	2016-11-16	

General Parameters

Conductivity (EC)	98	N/A	2	µS/cm	N/A	2016-11-16	
Nitrogen, Total Kjeldahl	0.05	N/A	0.05	mg/L	2016-11-16	2016-11-18	
pH	7.49	6.5-8.5	0.01	pH units	N/A	2016-11-16	HT2
Phosphorus, Total (as P)	0.008	N/A	0.002	mg/L	2016-11-21	2016-11-21	
Phosphorus, Total Dissolved	< 0.002	N/A	0.002	mg/L	2016-11-21	2016-11-21	
Turbidity	0.77	OG < 0.1	0.10	NTU	N/A	2016-11-14	

Calculated Parameters

Nitrate+Nitrite (as N)	0.040	N/A	0.010	mg/L	N/A	N/A	
Nitrogen, Total	0.093	N/A	0.050	mg/L	N/A	N/A	

Microbiological Parameters

Coliforms, Total	110	MAC = None Detected	1	CFU/100 mL	N/A	2016-11-14	
Background Colonies	> 200	N/A	200	CFU/100 mL	N/A	2016-11-14	
E. coli	2	MAC = None Detected	1	CFU/100 mL	N/A	2016-11-14	

Sample ID: Shuswap River (Wilsey Dam) (6110943-06) [Water] Sampled: 2016-11-13 09:10

FILT,
PRESa

Anions

Chloride	0.64	AO ≤ 250	0.10	mg/L	N/A	2016-11-16	
Nitrate (as N)	0.038	MAC = 10	0.010	mg/L	N/A	2016-11-16	
Nitrite (as N)	< 0.010	MAC = 1	0.010	mg/L	N/A	2016-11-16	
Sulfate	4.6	AO ≤ 500	1.0	mg/L	N/A	2016-11-16	

General Parameters

Conductivity (EC)	86	N/A	2	µS/cm	N/A	2016-11-16	
Nitrogen, Total Kjeldahl	0.06	N/A	0.05	mg/L	2016-11-16	2016-11-18	
pH	7.60	6.5-8.5	0.01	pH units	N/A	2016-11-16	HT2
Phosphorus, Total (as P)	0.004	N/A	0.002	mg/L	2016-11-21	2016-11-21	
Phosphorus, Total Dissolved	0.004	N/A	0.002	mg/L	2016-11-21	2016-11-21	
Turbidity	0.38	OG < 0.1	0.10	NTU	N/A	2016-11-14	

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Sample ID: Shuswap River (Wilsey Dam) (6110943-06) [Water] Sampled: 2016-11-13 09:10, Continued

FILT,
PRESa

Calculated Parameters							
Nitrate+Nitrite (as N)	0.038	N/A	0.010	mg/L	N/A	N/A	
Nitrogen, Total	0.095	N/A	0.050	mg/L	N/A	N/A	
Microbiological Parameters							
Coliforms, Total	49	MAC = None Detected	1	CFU/100 mL	N/A	2016-11-14	
Background Colonies	> 200	N/A	200	CFU/100 mL	N/A	2016-11-14	
E. coli	5	MAC = None Detected	1	CFU/100 mL	N/A	2016-11-14	

Sample ID: Vance Creek (Mabel Lake Road) (6110943-07) [Water] Sampled: 2016-11-13 09:50

FILT,
PRES

Anions							
Chloride	2.63	AO ≤ 250	0.10	mg/L	N/A	2016-11-16	
Nitrate (as N)	0.054	MAC = 10	0.010	mg/L	N/A	2016-11-16	
Nitrite (as N)	< 0.010	MAC = 1	0.010	mg/L	N/A	2016-11-16	
Sulfate	26.5	AO ≤ 500	1.0	mg/L	N/A	2016-11-16	
General Parameters							
Conductivity (EC)	342	N/A	2	µS/cm	N/A	2016-11-16	
Nitrogen, Total Kjeldahl	0.06	N/A	0.05	mg/L	2016-11-16	2016-11-18	
pH	8.11	6.5-8.5	0.01	pH units	N/A	2016-11-16	HT2
Phosphorus, Total (as P)	0.006	N/A	0.002	mg/L	2016-11-21	2016-11-21	
Phosphorus, Total Dissolved	0.005	N/A	0.002	mg/L	2016-11-21	2016-11-21	
Turbidity	0.83	OG < 0.1	0.10	NTU	N/A	2016-11-14	
Calculated Parameters							
Nitrate+Nitrite (as N)	0.054	N/A	0.010	mg/L	N/A	N/A	
Nitrogen, Total	0.118	N/A	0.050	mg/L	N/A	N/A	
Microbiological Parameters							
Coliforms, Total	40	MAC = None Detected	1	CFU/100 mL	N/A	2016-11-14	
Background Colonies	> 200	N/A	200	CFU/100 mL	N/A	2016-11-14	
E. coli	4	MAC = None Detected	1	CFU/100 mL	N/A	2016-11-14	

Sample / Analysis Qualifiers:

FILT Sample has been filtered for DP in the laboratory.
 HT2 The 15 minute recommended holding time (from sampling to analysis) has been exceeded - field analysis is recommended.
 PRES Sample has been preserved for DP and TN in the laboratory and the holding time has been extended.
 PRESa Sample has been preserved for TN and DP in the laboratory and the holding time has been extended.
 PRESb Sample has been preserved for TP and DP in the laboratory and the holding time has been extended.