

**REPORTED TO** Regional District of Thompson Nicola  
300 - 465 Victoria Street  
Kamloops, BC V2C 2A9

**TEL** (250) 377-6284  
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**ATTENTION** Shawn Kratchmer

**WORK ORDER** 7090042

**PO NUMBER**

**RECEIVED / TEMP** 2017-08-30 09:00 / 21°C

**PROJECT** Vavenby System CWS

**REPORTED** 2017-09-12

**PROJECT INFO**

**COC NUMBER** B 51127

**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.



Authorized By:

**Jennifer Shanko, A.Sc.T.**  
Account Manager

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

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Analysis Description	Method Reference	Technique	Location
Alkalinity in Water	APHA 2320 B*	Titration with H2SO4	Kelowna
Ammonia, Total in Water	APHA 4500-NH3 G*	Automated Colorimetry (Phenate)	Kelowna
Anions by IC in Water	APHA 4110 B	Ion Chromatography with Chemical Suppression of Eluent Conductivity	Kelowna
Carbon, Total Organic in Water	APHA 5310 B	High Temperature Combustion, Infrared CO2 Detection	Kelowna
Colour, True in Water	APHA 2120 C	Spectrophotometry (456 nm)	Kelowna
Conductivity in Water	APHA 2510 B	Conductivity Meter	Kelowna
Dissolved Metals by ICPMS in Water	APHA 3030 B / EPA 6020B	0.45 µm Filtration / Inductively Coupled Plasma-Mass Spectroscopy (ICP-MS)	Richmond
Haloacetic Acids in Water	EPA 552.3*	Liquid-Liquid Microextraction, Derivatization and GC-ECD	Richmond
Hardness (as CaCO3) in Water	APHA 2340 B	Calculation: 2.497 [diss Ca] + 4.118 [diss Mg]	N/A
Mercury, dissolved by CVAFS in Water	EPA 245.7*	BrCl2 Oxidation / Cold Vapor Atomic Fluorescence Spectrometry (CVAFS)	Richmond
Mercury, total by CVAFS in Water	EPA 245.7*	BrCl2 Oxidation / Cold Vapor Atomic Fluorescence Spectrometry (CVAFS)	Richmond
Solids, Total Dissolved in Water	APHA 2540 C*	Gravimetry (Dried at 103-105C)	Kelowna
Total Metals by ICPMS in Water	APHA 3030 E* / EPA 6020B	HNO3+HCl Hot Block Digestion / Inductively Coupled Plasma-Mass Spectroscopy (ICP-MS)	Richmond
Transmissivity at 254 nm in Water	APHA 5910 B*	Ultraviolet Absorption	Kelowna
Trihalomethanes in Water	EPA 5030B / APHA 6200 B	Purge&Trap / Purge and Trap Capillary Column GC-MSD	Richmond

**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  
EPA United States Environmental Protection Agency Test Methods

**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)  
% T Percent Transmittance  
CU Colour Units (referenced against a platinum cobalt standard)  
mg/L Milligrams per litre  
µS/cm Microsiemens per centimetre

**Standards / Guidelines Referenced in this Report:**

Guidelines for Canadian Drinking Water Quality (Feb 2017)

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](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: Vavenby/Firehall (7090042-01) [Water] Sampled: 2017-08-29 08:40**

**Anions**

Chloride	17.2	AO ≤ 250	0.10	mg/L	N/A	2017-09-02	
Fluoride	0.14	MAC = 1.5	0.10	mg/L	N/A	2017-09-02	
Nitrate (as N)	0.413	MAC = 10	0.010	mg/L	N/A	2017-09-02	
Nitrite (as N)	< 0.010	MAC = 1	0.010	mg/L	N/A	2017-09-02	
Sulfate	17.5	AO ≤ 500	1.0	mg/L	N/A	2017-09-02	

**General Parameters**

Alkalinity, Total (as CaCO3)	85.8	N/A	1.0	mg/L	N/A	2017-09-06	
Alkalinity, Phenolphthalein (as CaCO3)	< 1.0	N/A	1.0	mg/L	N/A	2017-09-06	
Alkalinity, Bicarbonate (as CaCO3)	85.8	N/A	1.0	mg/L	N/A	2017-09-06	
Alkalinity, Carbonate (as CaCO3)	< 1.0	N/A	1.0	mg/L	N/A	2017-09-06	
Alkalinity, Hydroxide (as CaCO3)	< 1.0	N/A	1.0	mg/L	N/A	2017-09-06	
Ammonia, Total (as N)	< 0.020	N/A	0.020	mg/L	N/A	2017-09-06	
Carbon, Total Organic	1.24	N/A	0.50	mg/L	N/A	2017-09-06	
Colour, True	< 5.0	AO ≤ 15	5.0	CU	N/A	2017-09-01	
Conductivity (EC)	265	N/A	2.0	µS/cm	N/A	2017-09-06	
Solids, Total Dissolved	141	AO ≤ 500	15	mg/L	N/A	2017-09-05	
UV Transmittance @ 254nm	95.1	N/A	0.10	% T	N/A	2017-09-01	

**Calculated Parameters**

Total Haloacetic Acids (HAA5)	0.00601	MAC = 0.08	0.00200	mg/L	N/A	N/A	
Total Trihalomethanes	0.0130	MAC = 0.1	0.00400	mg/L	N/A	N/A	
Hardness, Total (as CaCO3)	108	N/A	0.500	mg/L	N/A	N/A	
Nitrate+Nitrite (as N)	0.413	N/A	0.0200	mg/L	N/A	N/A	

**Dissolved Metals**

Aluminum, dissolved	< 0.0050	N/A	0.0050	mg/L	N/A	2017-09-06	
Antimony, dissolved	< 0.00020	N/A	0.00020	mg/L	N/A	2017-09-06	
Arsenic, dissolved	< 0.00050	N/A	0.00050	mg/L	N/A	2017-09-06	
Barium, dissolved	0.0223	N/A	0.0050	mg/L	N/A	2017-09-06	
Beryllium, dissolved	< 0.00010	N/A	0.00010	mg/L	N/A	2017-09-06	
Bismuth, dissolved	< 0.00010	N/A	0.00010	mg/L	N/A	2017-09-06	
Boron, dissolved	0.0284	N/A	0.0050	mg/L	N/A	2017-09-06	
Cadmium, dissolved	< 0.000010	N/A	0.000010	mg/L	N/A	2017-09-06	
Calcium, dissolved	29.1	N/A	0.20	mg/L	N/A	2017-09-06	
Chromium, dissolved	< 0.00050	N/A	0.00050	mg/L	N/A	2017-09-06	
Cobalt, dissolved	< 0.00010	N/A	0.00010	mg/L	N/A	2017-09-06	
Copper, dissolved	0.0923	N/A	0.00040	mg/L	N/A	2017-09-06	
Iron, dissolved	< 0.010	N/A	0.010	mg/L	N/A	2017-09-06	
Lead, dissolved	< 0.00020	N/A	0.00020	mg/L	N/A	2017-09-06	
Lithium, dissolved	0.0111	N/A	0.00010	mg/L	N/A	2017-09-06	
Magnesium, dissolved	8.53	N/A	0.010	mg/L	N/A	2017-09-06	
Manganese, dissolved	< 0.00020	N/A	0.00020	mg/L	N/A	2017-09-06	
Mercury, dissolved	< 0.000010	N/A	0.000010	mg/L	2017-09-06	2017-09-07	
Molybdenum, dissolved	0.00056	N/A	0.00010	mg/L	N/A	2017-09-06	
Nickel, dissolved	0.00103	N/A	0.00040	mg/L	N/A	2017-09-06	
Phosphorus, dissolved	< 0.050	N/A	0.050	mg/L	N/A	2017-09-06	

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**Sample ID: Vavenby/Firehall (7090042-01) [Water] Sampled: 2017-08-29 08:40, Continued**

***Dissolved Metals, Continued***

Potassium, dissolved	2.60	N/A	0.10	mg/L	N/A	2017-09-06	
Selenium, dissolved	< 0.00050	N/A	0.00050	mg/L	N/A	2017-09-06	
Silicon, dissolved	4.3	N/A	1.0	mg/L	N/A	2017-09-06	
Silver, dissolved	< 0.000050	N/A	0.000050	mg/L	N/A	2017-09-06	
Sodium, dissolved	12.6	N/A	0.10	mg/L	N/A	2017-09-06	
Strontium, dissolved	0.209	N/A	0.0010	mg/L	N/A	2017-09-06	
Sulfur, dissolved	6.6	N/A	3.0	mg/L	N/A	2017-09-06	
Tellurium, dissolved	< 0.00050	N/A	0.00050	mg/L	N/A	2017-09-06	
Thallium, dissolved	< 0.000020	N/A	0.000020	mg/L	N/A	2017-09-06	
Thorium, dissolved	< 0.00010	N/A	0.00010	mg/L	N/A	2017-09-06	
Tin, dissolved	0.00041	N/A	0.00020	mg/L	N/A	2017-09-06	
Titanium, dissolved	< 0.0050	N/A	0.0050	mg/L	N/A	2017-09-06	
Uranium, dissolved	0.00288	N/A	0.000020	mg/L	N/A	2017-09-06	
Vanadium, dissolved	< 0.0010	N/A	0.0010	mg/L	N/A	2017-09-06	
Zinc, dissolved	0.0260	N/A	0.0040	mg/L	N/A	2017-09-06	
Zirconium, dissolved	< 0.00010	N/A	0.00010	mg/L	N/A	2017-09-06	

***Total Metals***

Aluminum, total	0.268	OG < 0.1	0.0050	mg/L	2017-09-04	2017-09-05	
Antimony, total	< 0.00020	MAC = 0.006	0.00020	mg/L	2017-09-04	2017-09-05	
Arsenic, total	< 0.00050	MAC = 0.01	0.00050	mg/L	2017-09-04	2017-09-05	
Barium, total	0.0261	MAC = 1	0.0050	mg/L	2017-09-04	2017-09-05	
Beryllium, total	< 0.00010	N/A	0.00010	mg/L	2017-09-04	2017-09-05	
Bismuth, total	< 0.00010	N/A	0.00010	mg/L	2017-09-04	2017-09-05	
Boron, total	0.0311	MAC = 5	0.0050	mg/L	2017-09-04	2017-09-05	
Cadmium, total	0.000015	MAC = 0.005	0.000010	mg/L	2017-09-04	2017-09-05	
Calcium, total	27.8	N/A	0.20	mg/L	2017-09-04	2017-09-05	
Chromium, total	0.00081	MAC = 0.05	0.00050	mg/L	2017-09-04	2017-09-05	
Cobalt, total	0.00049	N/A	0.00010	mg/L	2017-09-04	2017-09-05	
Copper, total	0.162	AO ≤ 1	0.00040	mg/L	2017-09-04	2017-09-05	
Iron, total	0.439	AO ≤ 0.3	0.010	mg/L	2017-09-04	2017-09-05	
Lead, total	0.0317	MAC = 0.01	0.00020	mg/L	2017-09-04	2017-09-05	
Lithium, total	0.0105	N/A	0.00010	mg/L	2017-09-04	2017-09-05	
Magnesium, total	9.07	N/A	0.010	mg/L	2017-09-04	2017-09-05	
Manganese, total	0.0423	AO ≤ 0.05	0.00020	mg/L	2017-09-04	2017-09-05	
Mercury, total	< 0.000010	MAC = 0.001	0.000010	mg/L	2017-09-06	2017-09-07	
Molybdenum, total	0.00053	N/A	0.00010	mg/L	2017-09-04	2017-09-05	
Nickel, total	0.00160	N/A	0.00040	mg/L	2017-09-04	2017-09-05	
Phosphorus, total	< 0.050	N/A	0.050	mg/L	2017-09-04	2017-09-05	
Potassium, total	2.65	N/A	0.10	mg/L	2017-09-04	2017-09-05	
Selenium, total	< 0.00050	MAC = 0.05	0.00050	mg/L	2017-09-04	2017-09-05	
Silicon, total	4.5	N/A	1.0	mg/L	2017-09-04	2017-09-05	
Silver, total	< 0.000050	N/A	0.000050	mg/L	2017-09-04	2017-09-05	
Sodium, total	13.5	AO ≤ 200	0.10	mg/L	2017-09-04	2017-09-05	
Strontium, total	0.210	N/A	0.0010	mg/L	2017-09-04	2017-09-05	
Sulfur, total	6.0	N/A	3.0	mg/L	2017-09-04	2017-09-05	

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**Sample ID: Vavenby/Firehall (7090042-01) [Water] Sampled: 2017-08-29 08:40, Continued**

**Total Metals, Continued**

Tellurium, total	< 0.00050	N/A	0.00050	mg/L	2017-09-04	2017-09-05	
Thallium, total	<b>0.000026</b>	N/A	0.000020	mg/L	2017-09-04	2017-09-05	
Thorium, total	< 0.00010	N/A	0.00010	mg/L	2017-09-04	2017-09-05	
Tin, total	< 0.00020	N/A	0.00020	mg/L	2017-09-04	2017-09-05	
Titanium, total	<b>0.0274</b>	N/A	0.0050	mg/L	2017-09-04	2017-09-05	
Uranium, total	<b>0.00300</b>	MAC = 0.02	0.000020	mg/L	2017-09-04	2017-09-05	
Vanadium, total	< 0.0010	N/A	0.0010	mg/L	2017-09-04	2017-09-05	
Zinc, total	<b>0.0359</b>	AO ≤ 5	0.0040	mg/L	2017-09-04	2017-09-05	
Zirconium, total	< 0.00010	N/A	0.00010	mg/L	2017-09-04	2017-09-05	

**Haloacetic Acids**

Monochloroacetic Acid	< 0.0020	N/A	0.0020	mg/L	2017-09-08	2017-09-08	
Monobromoacetic Acid	< 0.0020	N/A	0.0020	mg/L	2017-09-08	2017-09-08	
Dichloroacetic Acid	<b>0.0028</b>	N/A	0.0020	mg/L	2017-09-08	2017-09-08	
Trichloroacetic Acid	<b>0.0033</b>	N/A	0.0020	mg/L	2017-09-08	2017-09-08	
Dibromoacetic Acid	< 0.0020	N/A	0.0020	mg/L	2017-09-08	2017-09-08	
Surrogate: 2-Bromopropionic Acid	107		70-130	%	2017-09-08	2017-09-08	

**Volatile Organic Compounds (VOC)**

Bromodichloromethane	<b>0.0026</b>	N/A	0.0010	mg/L	N/A	2017-09-06	
Bromoform	< 0.0010	N/A	0.0010	mg/L	N/A	2017-09-06	
Chloroform	<b>0.0105</b>	N/A	0.0010	mg/L	N/A	2017-09-06	
Dibromochloromethane	< 0.0010	N/A	0.0010	mg/L	N/A	2017-09-06	
Surrogate: Toluene-d8	102		70-130	%	N/A	2017-09-06	
Surrogate: 4-Bromofluorobenzene	103		70-130	%	N/A	2017-09-06	