

REPORTED TO Regional District of Thompson Nicola
300 - 465 Victoria Street
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ATTENTION Shawn Kratchmer

WORK ORDER 5091917

PO NUMBER

RECEIVED / TEMP Sep-24-15 09:00 / 15°C

PROJECT Walhachin CWS

REPORTED Oct-01-15

PROJECT INFO

COC NUMBER B27891

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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Analysis Description	Method Reference	Technique	Location
Alkalinity in Water (Speciated)	APHA 2320 B*	Titration with H2SO4	Kelowna
Ammonia-N in Water (total)	APHA 4500-NH3 G*	Automated Colorimetry (Phenate)	Kelowna
Anions in Water by IC	APHA 4110 B	Ion Chromatography with Chemical Suppression of Eluent Conductivity	Kelowna
Colour, True	APHA 2120 C	Spectrophotometry (456 nm)	Kelowna
Conductivity in Water	APHA 2510 B	Conductivity Meter	Kelowna
Dissolved Metals	APHA 3030 B / APHA 3125 B	0.45 µm Filtration / Inductively Coupled Plasma Mass Spectrometry (ICP-MS)	Richmond
Hardness (as CaCO3)	APHA 2340 B	Calculation: 2.497 [Ca] + 4.118 [Mg]	N/A
Mercury, total by CVAFS	EPA 245.7*	BrCl2 Oxidation / Cold Vapor Atomic Fluorescence Spectrometry (CVAFS)	Richmond
Total Dissolved Solids (Gravimetric)	APHA 2540 C*	Gravimetry (Dried at 103-105C)	Kelowna
Total Recoverable Metals	APHA 3030E* / APHA 3125 B	HNO3+HCl Hot Block Digestion / Inductively Coupled Plasma Mass Spectrometry (ICP-MS)	Richmond
Transmissivity at 254 nm	APHA 5910 B	Ultraviolet Absorption	Kelowna
Trihalomethanes	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
% 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 (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: Walhachin CWS (5091917-01) [Water] Sampled: Sep-23-15 12:00

CT1

Anions

Chloride	3.54	AO ≤ 250	0.10	mg/L	N/A	Sep-26-15	
Fluoride	< 0.10	MAC = 1.5	0.10	mg/L	N/A	Sep-26-15	
Nitrate as N	0.054	MAC = 10	0.010	mg/L	N/A	Sep-26-15	
Nitrite as N	< 0.010	MAC = 1	0.010	mg/L	N/A	Sep-26-15	
Sulfate	8.5	AO ≤ 500	1.0	mg/L	N/A	Sep-26-15	

General Parameters

Alkalinity, Total as CaCO3	37	N/A	1	mg/L	N/A	Sep-24-15	
Alkalinity, Phenolphthalein as CaCO3	< 1	N/A	1	mg/L	N/A	Sep-24-15	
Alkalinity, Bicarbonate as CaCO3	37	N/A	1	mg/L	N/A	Sep-24-15	
Alkalinity, Carbonate as CaCO3	< 1	N/A	1	mg/L	N/A	Sep-24-15	
Alkalinity, Hydroxide as CaCO3	< 1	N/A	1	mg/L	N/A	Sep-24-15	
Colour, True	< 5	AO ≤ 15	5	CU	N/A	Sep-25-15	
Conductivity (EC)	104	N/A	2	µS/cm	N/A	Sep-24-15	
Ammonia as N, Total	< 0.020	N/A	0.020	mg/L	N/A	Sep-25-15	
Solids, Total Dissolved	51	AO ≤ 500	10	mg/L	N/A	Sep-30-15	
UV Transmittance @ 254nm	94.5	N/A	0.1	% T	N/A	Sep-25-15	

Calculated Parameters

Hardness, Total (Diss. as CaCO3)	35.0	N/A	5.0	mg/L	N/A	N/A	
Hardness, Total (Total as CaCO3)	37.2	N/A	5.0	mg/L	N/A	N/A	
Nitrate+Nitrite as N	0.054	N/A	0.020	mg/L	N/A	N/A	

Dissolved Metals

Aluminum, dissolved	< 0.05	N/A	0.05	mg/L	N/A	Sep-29-15	
Antimony, dissolved	< 0.001	N/A	0.001	mg/L	N/A	Sep-29-15	
Arsenic, dissolved	< 0.005	N/A	0.005	mg/L	N/A	Sep-29-15	
Barium, dissolved	< 0.05	N/A	0.05	mg/L	N/A	Sep-29-15	
Beryllium, dissolved	< 0.001	N/A	0.001	mg/L	N/A	Sep-29-15	
Bismuth, dissolved	< 0.001	N/A	0.001	mg/L	N/A	Sep-29-15	
Boron, dissolved	< 0.04	N/A	0.04	mg/L	N/A	Sep-29-15	
Cadmium, dissolved	< 0.0001	N/A	0.0001	mg/L	N/A	Sep-29-15	
Calcium, dissolved	10.8	N/A	2.0	mg/L	N/A	Sep-29-15	
Chromium, dissolved	< 0.005	N/A	0.005	mg/L	N/A	Sep-29-15	
Cobalt, dissolved	< 0.0005	N/A	0.0005	mg/L	N/A	Sep-29-15	
Copper, dissolved	0.003	N/A	0.002	mg/L	N/A	Sep-29-15	
Iron, dissolved	0.17	N/A	0.10	mg/L	N/A	Sep-29-15	
Lead, dissolved	< 0.001	N/A	0.001	mg/L	N/A	Sep-29-15	
Lithium, dissolved	0.001	N/A	0.001	mg/L	N/A	Sep-29-15	
Magnesium, dissolved	1.9	N/A	0.1	mg/L	N/A	Sep-29-15	
Manganese, dissolved	< 0.002	N/A	0.002	mg/L	N/A	Sep-29-15	
Mercury, dissolved	< 0.0002	N/A	0.0002	mg/L	N/A	Sep-29-15	
Molybdenum, dissolved	< 0.001	N/A	0.001	mg/L	N/A	Sep-29-15	
Nickel, dissolved	< 0.002	N/A	0.002	mg/L	N/A	Sep-29-15	
Phosphorus, dissolved	< 0.2	N/A	0.2	mg/L	N/A	Sep-29-15	
Potassium, dissolved	0.6	N/A	0.2	mg/L	N/A	Sep-29-15	
Selenium, dissolved	< 0.005	N/A	0.005	mg/L	N/A	Sep-29-15	

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Sample ID: Walhachin CWS (5091917-01) [Water] Sampled: Sep-23-15 12:00, Continued

CT1

Dissolved Metals, Continued

Silicon, dissolved	< 5	N/A	5	mg/L	N/A	Sep-29-15	
Silver, dissolved	< 0.0005	N/A	0.0005	mg/L	N/A	Sep-29-15	
Sodium, dissolved	5.7	N/A	0.2	mg/L	N/A	Sep-29-15	
Strontium, dissolved	0.07	N/A	0.01	mg/L	N/A	Sep-29-15	
Sulfur, dissolved	< 10	N/A	10	mg/L	N/A	Sep-29-15	
Tellurium, dissolved	< 0.002	N/A	0.002	mg/L	N/A	Sep-29-15	
Thallium, dissolved	< 0.0002	N/A	0.0002	mg/L	N/A	Sep-29-15	
Thorium, dissolved	< 0.001	N/A	0.001	mg/L	N/A	Sep-29-15	
Tin, dissolved	< 0.002	N/A	0.002	mg/L	N/A	Sep-29-15	
Titanium, dissolved	< 0.05	N/A	0.05	mg/L	N/A	Sep-29-15	
Uranium, dissolved	0.0002	N/A	0.0002	mg/L	N/A	Sep-29-15	
Vanadium, dissolved	< 0.01	N/A	0.01	mg/L	N/A	Sep-29-15	
Zinc, dissolved	< 0.04	N/A	0.04	mg/L	N/A	Sep-29-15	
Zirconium, dissolved	< 0.001	N/A	0.001	mg/L	N/A	Sep-29-15	

Total Recoverable Metals

Aluminum, total	0.07	OG < 0.1	0.05	mg/L	Sep-29-15	Sep-30-15	
Antimony, total	< 0.001	MAC = 0.006	0.001	mg/L	Sep-29-15	Sep-30-15	
Arsenic, total	< 0.005	MAC = 0.01	0.005	mg/L	Sep-29-15	Sep-30-15	
Barium, total	< 0.05	MAC = 1	0.05	mg/L	Sep-29-15	Sep-30-15	
Beryllium, total	< 0.001	N/A	0.001	mg/L	Sep-29-15	Sep-30-15	
Bismuth, total	< 0.001	N/A	0.001	mg/L	Sep-29-15	Sep-30-15	
Boron, total	< 0.04	MAC = 5	0.04	mg/L	Sep-29-15	Sep-30-15	
Cadmium, total	< 0.0001	MAC = 0.005	0.0001	mg/L	Sep-29-15	Sep-30-15	
Calcium, total	11.5	N/A	2.0	mg/L	Sep-29-15	Sep-30-15	
Chromium, total	< 0.005	MAC = 0.05	0.005	mg/L	Sep-29-15	Sep-30-15	
Cobalt, total	< 0.0005	N/A	0.0005	mg/L	Sep-29-15	Sep-30-15	
Copper, total	0.011	AO ≤ 1	0.002	mg/L	Sep-29-15	Sep-30-15	
Iron, total	< 0.10	AO ≤ 0.3	0.10	mg/L	Sep-29-15	Sep-30-15	
Lead, total	< 0.001	MAC = 0.01	0.001	mg/L	Sep-29-15	Sep-30-15	
Lithium, total	0.001	N/A	0.001	mg/L	Sep-29-15	Sep-30-15	
Magnesium, total	2.0	N/A	0.1	mg/L	Sep-29-15	Sep-30-15	
Manganese, total	< 0.002	AO ≤ 0.05	0.002	mg/L	Sep-29-15	Sep-30-15	
Mercury, total	< 0.00002	MAC = 0.001	0.00002	mg/L	Sep-29-15	Sep-29-15	
Molybdenum, total	< 0.001	N/A	0.001	mg/L	Sep-29-15	Sep-30-15	
Nickel, total	< 0.002	N/A	0.002	mg/L	Sep-29-15	Sep-30-15	
Phosphorus, total	< 0.2	N/A	0.2	mg/L	Sep-29-15	Sep-30-15	
Potassium, total	0.6	N/A	0.2	mg/L	Sep-29-15	Sep-30-15	
Selenium, total	< 0.005	MAC = 0.05	0.005	mg/L	Sep-29-15	Sep-30-15	
Silicon, total	< 5	N/A	5	mg/L	Sep-29-15	Sep-30-15	
Silver, total	< 0.0005	N/A	0.0005	mg/L	Sep-29-15	Sep-30-15	
Sodium, total	8.2	AO ≤ 200	0.2	mg/L	Sep-29-15	Sep-30-15	
Strontium, total	0.08	N/A	0.01	mg/L	Sep-29-15	Sep-30-15	
Sulfur, total	15	N/A	10	mg/L	Sep-29-15	Sep-30-15	
Tellurium, total	< 0.002	N/A	0.002	mg/L	Sep-29-15	Sep-30-15	
Thallium, total	< 0.0002	N/A	0.0002	mg/L	Sep-29-15	Sep-30-15	

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Sample ID: Walhachin CWS (5091917-01) [Water] Sampled: Sep-23-15 12:00, Continued

CT1

Total Recoverable Metals, Continued

Thorium, total	< 0.001	N/A	0.001 mg/L	Sep-29-15	Sep-30-15	
Tin, total	< 0.002	N/A	0.002 mg/L	Sep-29-15	Sep-30-15	
Titanium, total	< 0.05	N/A	0.05 mg/L	Sep-29-15	Sep-30-15	
Uranium, total	0.0002	MAC = 0.02	0.0002 mg/L	Sep-29-15	Sep-30-15	
Vanadium, total	< 0.01	N/A	0.01 mg/L	Sep-29-15	Sep-30-15	
Zinc, total	< 0.04	AO ≤ 5	0.04 mg/L	Sep-29-15	Sep-30-15	
Zirconium, total	< 0.001	N/A	0.001 mg/L	Sep-29-15	Sep-30-15	

Sample ID: Walhachin CWS - Raw (5091917-02) [Water] Sampled: Sep-23-15 12:00

Calculated Parameters

Total Trihalomethanes	< 0.004	MAC = 0.1	0.004 mg/L	N/A	N/A	
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Volatile Organic Compounds (VOC)

Bromodichloromethane	< 0.001	N/A	0.001 mg/L	N/A	Sep-29-15	
Bromoform	< 0.001	N/A	0.001 mg/L	N/A	Sep-29-15	
Chloroform	< 0.001	N/A	0.001 mg/L	N/A	Sep-29-15	
Dibromochloromethane	< 0.001	N/A	0.001 mg/L	N/A	Sep-29-15	
Surrogate: Toluene-d8	93		70-130 %	N/A	Sep-29-15	
Surrogate: 4-Bromofluorobenzene	63		70-130 %	N/A	Sep-29-15	S02

Sample / Analysis Qualifiers:

CT1 Incorrect Container(s) supplied for Dissolved Hg analysis
S02 Surrogate recovery outside of control limits. Data accepted based on acceptable recovery of other surrogates.