

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

WORK ORDER 6120706

PO NUMBER

RECEIVED / TEMP 2016-12-09 09:00 / 7°C

PROJECT Del Oro CWS

REPORTED 2016-12-16

PROJECT INFO

COC NUMBER B 49226

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	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
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 / APHA 3125 B	0.45 µm Filtration / Inductively Coupled Plasma Mass Spectrometry (ICP-MS)	Richmond
Hardness (as CaCO3) in Water	APHA 2340 B	Calculation: 2.497 [diss Ca] + 4.118 [diss Mg]	N/A
Hardness (as CaCO3) in Water	APHA 2340 B*	Calculation: 2.497 [total Ca] + 4.118 [total Mg] (Estimated)	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 (Calc) in Water	APHA 1030 E	Calculation: 100 x ([Cations]-[Anions])/([Cations]+[Anions])	N/A
Total Metals by ICPMS in Water	APHA 3030E* / APHA 3125 B	HNO3+HCl Hot Block Digestion / Inductively Coupled Plasma Mass Spectrometry (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 (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: Del Oro CWS - SP East (6120706-01) [Water] Sampled: 2016-12-08 14:00

F1

Anions

Chloride	4.78	AO ≤ 250	0.10	mg/L	N/A	2016-12-11	
Fluoride	< 0.10	MAC = 1.5	0.10	mg/L	N/A	2016-12-11	
Nitrate (as N)	0.045	MAC = 10	0.010	mg/L	N/A	2016-12-11	
Nitrite (as N)	< 0.010	MAC = 1	0.010	mg/L	N/A	2016-12-11	
Sulfate	5.2	AO ≤ 500	1.0	mg/L	N/A	2016-12-11	

General Parameters

Alkalinity, Total (as CaCO3)	44	N/A	2	mg/L	N/A	2016-12-13	
Alkalinity, Phenolphthalein (as CaCO3)	1	N/A	2	mg/L	N/A	2016-12-13	
Alkalinity, Bicarbonate (as CaCO3)	42	N/A	2	mg/L	N/A	2016-12-13	
Alkalinity, Carbonate (as CaCO3)	2	N/A	2	mg/L	N/A	2016-12-13	
Alkalinity, Hydroxide (as CaCO3)	< 1	N/A	2	mg/L	N/A	2016-12-13	
Ammonia, Total (as N)	0.060	N/A	0.020	mg/L	N/A	2016-12-13	
Colour, True	< 5	AO ≤ 15	5	CU	N/A	2016-12-09	
Conductivity (EC)	115	N/A	2	µS/cm	N/A	2016-12-13	
UV Transmittance @ 254nm	93.5	N/A	0.1	% T	N/A	2016-12-09	

Calculated Parameters

Total Trihalomethanes	0.105	MAC = 0.1	0.004	mg/L	N/A	N/A	
Hardness, Total (as CaCO3)	43.8	N/A	0.50	mg/L	N/A	N/A	
Nitrate+Nitrite (as N)	0.045	N/A	0.020	mg/L	N/A	N/A	
Solids, Total Dissolved	60	AO ≤ 500	10	mg/L	N/A	2016-12-16	

Dissolved Metals

Aluminum, dissolved	0.019	N/A	0.005	mg/L	N/A	2016-12-14	
Antimony, dissolved	< 0.0001	N/A	0.0001	mg/L	N/A	2016-12-14	
Arsenic, dissolved	< 0.0005	N/A	0.0005	mg/L	N/A	2016-12-14	
Barium, dissolved	0.007	N/A	0.005	mg/L	N/A	2016-12-14	
Beryllium, dissolved	< 0.0001	N/A	0.0001	mg/L	N/A	2016-12-14	
Bismuth, dissolved	< 0.0001	N/A	0.0001	mg/L	N/A	2016-12-14	
Boron, dissolved	< 0.004	N/A	0.004	mg/L	N/A	2016-12-14	
Cadmium, dissolved	< 0.00001	N/A	0.00001	mg/L	N/A	2016-12-14	
Calcium, dissolved	16.5	N/A	0.2	mg/L	N/A	2016-12-14	
Chromium, dissolved	< 0.0005	N/A	0.0005	mg/L	N/A	2016-12-14	
Cobalt, dissolved	< 0.00005	N/A	0.00005	mg/L	N/A	2016-12-14	
Copper, dissolved	0.0010	N/A	0.0002	mg/L	N/A	2016-12-14	
Iron, dissolved	< 0.010	N/A	0.010	mg/L	N/A	2016-12-14	
Lead, dissolved	< 0.0001	N/A	0.0001	mg/L	N/A	2016-12-14	
Lithium, dissolved	0.0006	N/A	0.0001	mg/L	N/A	2016-12-14	
Magnesium, dissolved	0.63	N/A	0.01	mg/L	N/A	2016-12-14	
Manganese, dissolved	0.0005	N/A	0.0002	mg/L	N/A	2016-12-14	
Mercury, dissolved	< 0.00002	N/A	0.00002	mg/L	2016-12-14	2016-12-14	
Molybdenum, dissolved	0.0006	N/A	0.0001	mg/L	N/A	2016-12-14	
Nickel, dissolved	< 0.0002	N/A	0.0002	mg/L	N/A	2016-12-14	
Phosphorus, dissolved	< 0.02	N/A	0.02	mg/L	N/A	2016-12-14	
Potassium, dissolved	0.79	N/A	0.02	mg/L	N/A	2016-12-14	
Selenium, dissolved	< 0.0005	N/A	0.0005	mg/L	N/A	2016-12-14	

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F1

Dissolved Metals, Continued

Silicon, dissolved	2.9	N/A	0.5	mg/L	N/A	2016-12-14	
Silver, dissolved	< 0.00005	N/A	0.00005	mg/L	N/A	2016-12-14	
Sodium, dissolved	4.94	N/A	0.02	mg/L	N/A	2016-12-14	
Strontium, dissolved	0.072	N/A	0.001	mg/L	N/A	2016-12-14	
Sulfur, dissolved	2	N/A	1	mg/L	N/A	2016-12-14	
Tellurium, dissolved	< 0.0002	N/A	0.0002	mg/L	N/A	2016-12-14	
Thallium, dissolved	< 0.00002	N/A	0.00002	mg/L	N/A	2016-12-14	
Thorium, dissolved	< 0.0001	N/A	0.0001	mg/L	N/A	2016-12-14	
Tin, dissolved	< 0.0002	N/A	0.0002	mg/L	N/A	2016-12-14	
Titanium, dissolved	< 0.005	N/A	0.005	mg/L	N/A	2016-12-14	
Uranium, dissolved	0.00027	N/A	0.00002	mg/L	N/A	2016-12-14	
Vanadium, dissolved	< 0.001	N/A	0.001	mg/L	N/A	2016-12-14	
Zinc, dissolved	0.024	N/A	0.004	mg/L	N/A	2016-12-14	
Zirconium, dissolved	< 0.0001	N/A	0.0001	mg/L	N/A	2016-12-14	

Total Metals

Aluminum, total	0.025	OG < 0.1	0.005	mg/L	2016-12-14	2016-12-15	
Antimony, total	< 0.0001	MAC = 0.006	0.0001	mg/L	2016-12-14	2016-12-15	
Arsenic, total	< 0.0005	MAC = 0.01	0.0005	mg/L	2016-12-14	2016-12-15	
Barium, total	0.008	MAC = 1	0.005	mg/L	2016-12-14	2016-12-15	
Beryllium, total	< 0.0001	N/A	0.0001	mg/L	2016-12-14	2016-12-15	
Bismuth, total	< 0.0001	N/A	0.0001	mg/L	2016-12-14	2016-12-15	
Boron, total	< 0.004	MAC = 5	0.004	mg/L	2016-12-14	2016-12-15	
Cadmium, total	< 0.00001	MAC = 0.005	0.00001	mg/L	2016-12-14	2016-12-15	
Calcium, total	16.6	N/A	0.2	mg/L	2016-12-14	2016-12-15	
Chromium, total	< 0.0005	MAC = 0.05	0.0005	mg/L	2016-12-14	2016-12-15	
Cobalt, total	< 0.00005	N/A	0.00005	mg/L	2016-12-14	2016-12-15	
Copper, total	0.0014	AO ≤ 1	0.0002	mg/L	2016-12-14	2016-12-15	
Iron, total	0.02	AO ≤ 0.3	0.01	mg/L	2016-12-14	2016-12-15	
Lead, total	0.0001	MAC = 0.01	0.0001	mg/L	2016-12-14	2016-12-15	
Lithium, total	0.0006	N/A	0.0001	mg/L	2016-12-14	2016-12-15	
Magnesium, total	0.66	N/A	0.01	mg/L	2016-12-14	2016-12-15	
Manganese, total	0.0009	AO ≤ 0.05	0.0002	mg/L	2016-12-14	2016-12-15	
Mercury, total	< 0.00002	MAC = 0.001	0.00002	mg/L	2016-12-14	2016-12-14	
Molybdenum, total	0.0006	N/A	0.0001	mg/L	2016-12-14	2016-12-15	
Nickel, total	< 0.0002	N/A	0.0002	mg/L	2016-12-14	2016-12-15	
Phosphorus, total	< 0.02	N/A	0.02	mg/L	2016-12-14	2016-12-15	
Potassium, total	0.88	N/A	0.02	mg/L	2016-12-14	2016-12-15	
Selenium, total	< 0.0005	MAC = 0.05	0.0005	mg/L	2016-12-14	2016-12-15	
Silicon, total	3.0	N/A	0.5	mg/L	2016-12-14	2016-12-15	
Silver, total	< 0.00005	N/A	0.00005	mg/L	2016-12-14	2016-12-15	
Sodium, total	5.34	AO ≤ 200	0.02	mg/L	2016-12-14	2016-12-15	
Strontium, total	0.084	N/A	0.001	mg/L	2016-12-14	2016-12-15	
Sulfur, total	2	N/A	1	mg/L	2016-12-14	2016-12-15	
Tellurium, total	< 0.0002	N/A	0.0002	mg/L	2016-12-14	2016-12-15	
Thallium, total	< 0.00002	N/A	0.00002	mg/L	2016-12-14	2016-12-15	

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Sample ID: Del Oro CWS - SP East (6120706-01) [Water] Sampled: 2016-12-08 14:00, Continued

F1

Total Metals, Continued

Thorium, total	< 0.0001	N/A	0.0001	mg/L	2016-12-14	2016-12-15	
Tin, total	< 0.0002	N/A	0.0002	mg/L	2016-12-14	2016-12-15	
Titanium, total	< 0.005	N/A	0.005	mg/L	2016-12-14	2016-12-15	
Uranium, total	0.00031	MAC = 0.02	0.00002	mg/L	2016-12-14	2016-12-15	
Vanadium, total	< 0.001	N/A	0.001	mg/L	2016-12-14	2016-12-15	
Zinc, total	0.043	AO ≤ 5	0.004	mg/L	2016-12-14	2016-12-15	
Zirconium, total	< 0.0001	N/A	0.0001	mg/L	2016-12-14	2016-12-15	

Volatile Organic Compounds (VOC)

Bromodichloromethane	0.002	N/A	0.001	mg/L	N/A	2016-12-15	
Bromoform	< 0.001	N/A	0.001	mg/L	N/A	2016-12-15	
Chloroform	0.103	N/A	0.001	mg/L	N/A	2016-12-15	
Dibromochloromethane	< 0.001	N/A	0.001	mg/L	N/A	2016-12-15	
Surrogate: Toluene-d8	123		70-130	%	N/A	2016-12-15	
Surrogate: 4-Bromofluorobenzene	119		70-130	%	N/A	2016-12-15	

Sample / Analysis Qualifiers:

F1 The sample was not field-filtered and was therefore filtered through a 0.45 µm membrane in the laboratory and preserved with HNO3 prior to analysis for dissolved metals.