

REPORTED TO Trail, City of - DW
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Trail, BC V1R 4E6

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ATTENTION Chris McIsaac

WORK ORDER 3070250

PO NUMBER 2013070
PROJECT Bear Creek
PROJECT INFO

RECEIVED / TEMP Jul-04-13 08:00 / 13.0 °C
REPORTED Jul-10-13
COC NUMBER COC No#

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.



Issued By:

Jennifer Shanko, ASCT
Administration Coordinator, Kelowna

Please contact CARO if more information is needed or to provide feedback on our services.

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Analysis Description	Method Reference (* = modified from)		Location
	Preparation	Analysis	
Alkalinity, speciated	N/A	APHA 2320 B	Kelowna
Ammonia-N, total colorimetric	N/A	APHA 4500-NH3 G	Kelowna
Chloride in Water by IC	N/A	APHA 4110 B	Kelowna
Conductivity in Water	N/A	APHA 2510 B	Kelowna
Dissolved Metals	APHA 3030 B	APHA 3125 B	Richmond
Fluoride in Water by IC	N/A	APHA 4110 B	Kelowna
Hardness as CaCO3 (CALC)	N/A	APHA 2340 B	Richmond
Nitrate-N in Water by IC	N/A	APHA 4110 B	Kelowna
Nitrite-N in Water by IC	N/A	APHA 4110 B	Kelowna
pH in Water	N/A	APHA 4500-H+ B	Kelowna
Sulfate in Water by IC	N/A	APHA 4110 B	Kelowna
Total Kjeldahl Nitrogen	N/A	EPA 351.2 (1993) *	Kelowna
Total Recoverable Metals	APHA 3030E *	APHA 3125 B	Richmond

Note: The numbers in brackets represent the year that the method was published/approved

Method Reference Descriptions:

APHA Standard Methods for the Examination of Water and Wastewater, American Public Health Association
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-related guideline)
 mg/L Milligrams per litre
 pH units pH < 7 = acidic, pH > 7 = basic
 uS/cm Microsiemens per centimeter

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Analyte	Result / Recovery	Canadian DW Guideline	MRL / Limit	Units	Prepared	Analyzed	Notes
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Anions

Sample ID: Bear Creek (3070250-01) [Water] Sampled: Jul-03-13 12:47

Alkalinity, Total as CaCO ₃	67			1 mg/L	N/A	Jul-04-13	
Alkalinity, Phenolphthalein as CaCO ₃	< 1			1 mg/L	N/A	Jul-04-13	
Alkalinity, Carbonate as CaCO ₃	< 1			1 mg/L	N/A	Jul-04-13	
Alkalinity, Bicarbonate as CaCO ₃	67			1 mg/L	N/A	Jul-04-13	
Alkalinity, Hydroxide as CaCO ₃	< 1			1 mg/L	N/A	Jul-04-13	
Chloride	4.18	AO ≤ 250		0.10 mg/L	N/A	Jul-04-13	
Fluoride	< 0.10	MAC = 1.5		0.10 mg/L	N/A	Jul-04-13	
Nitrogen, Nitrate as N	0.324	MAC = 10		0.010 mg/L	N/A	Jul-04-13	
Nitrogen, Nitrite as N	< 0.010	MAC = 1		0.010 mg/L	N/A	Jul-04-13	
Sulfate	25.8	AO ≤ 500		1.0 mg/L	N/A	Jul-04-13	

General Parameters

Sample ID: Bear Creek (3070250-01) [Water] Sampled: Jul-03-13 12:47

Conductivity (EC)	204			2 uS/cm	N/A	Jul-04-13	
Nitrogen, Ammonia as N, Total	< 0.020			0.020 mg/L	N/A	Jul-05-13	
Nitrogen, Total Kjeldahl	0.08			0.05 mg/L	Jul-04-13	Jul-08-13	
pH	7.57	AO = 6.5 - 8.5		0.01 pH units	N/A	Jul-04-13	

Calculated Parameters

Sample ID: Bear Creek (3070250-01) [Water] Sampled: Jul-03-13 12:47

Hardness, Total (Total as CaCO ₃)	91.1			5.0 mg/L	N/A	N/A	
Hardness, Total (Diss. as CaCO ₃)	89.1			5.0 mg/L	N/A	N/A	
Nitrogen, Nitrate+Nitrite as N	0.324			0.020 mg/L	N/A	N/A	

Dissolved Metals

Sample ID: Bear Creek (3070250-01) [Water] Sampled: Jul-03-13 12:47

Aluminum, dissolved	< 0.05			0.05 mg/L	N/A	Jul-08-13	
Antimony, dissolved	< 0.001			0.001 mg/L	N/A	Jul-08-13	
Arsenic, dissolved	< 0.005			0.005 mg/L	N/A	Jul-08-13	
Barium, dissolved	< 0.05			0.05 mg/L	N/A	Jul-08-13	
Beryllium, dissolved	< 0.001			0.001 mg/L	N/A	Jul-08-13	
Bismuth, dissolved	< 0.001			0.001 mg/L	N/A	Jul-08-13	
Boron, dissolved	< 0.04			0.04 mg/L	N/A	Jul-08-13	
Cadmium, dissolved	< 0.0001			0.0001 mg/L	N/A	Jul-08-13	
Calcium, dissolved	29			2 mg/L	N/A	Jul-08-13	
Chromium, dissolved	< 0.005			0.005 mg/L	N/A	Jul-08-13	
Cobalt, dissolved	< 0.0005			0.0005 mg/L	N/A	Jul-08-13	
Copper, dissolved	< 0.002			0.002 mg/L	N/A	Jul-08-13	
Iron, dissolved	< 0.1			0.1 mg/L	N/A	Jul-08-13	
Lead, dissolved	< 0.001			0.001 mg/L	N/A	Jul-08-13	
Lithium, dissolved	< 0.001			0.001 mg/L	N/A	Jul-08-13	
Magnesium, dissolved	4.0			0.1 mg/L	N/A	Jul-08-13	

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Dissolved Metals, Continued

Sample ID: Bear Creek (3070250-01) [Water] Sampled: Jul-03-13 12:47, Continued

Manganese, dissolved	< 0.002		0.002	mg/L	N/A	Jul-08-13	
Mercury, dissolved	< 0.0002		0.0002	mg/L	N/A	Jul-08-13	
Molybdenum, dissolved	0.001		0.001	mg/L	N/A	Jul-08-13	
Nickel, dissolved	< 0.002		0.002	mg/L	N/A	Jul-08-13	
Phosphorus, dissolved	< 0.2		0.2	mg/L	N/A	Jul-08-13	
Potassium, dissolved	1.2		0.2	mg/L	N/A	Jul-08-13	
Selenium, dissolved	< 0.005		0.005	mg/L	N/A	Jul-08-13	
Silicon, dissolved	8		5	mg/L	N/A	Jul-08-13	
Silver, dissolved	0.0012		0.0005	mg/L	N/A	Jul-08-13	
Sodium, dissolved	3.5		0.2	mg/L	N/A	Jul-08-13	
Strontium, dissolved	0.17		0.01	mg/L	N/A	Jul-08-13	
Sulfur, dissolved	< 10		10	mg/L	N/A	Jul-08-13	
Tellurium, dissolved	< 0.002		0.002	mg/L	N/A	Jul-08-13	
Thallium, dissolved	< 0.0002		0.0002	mg/L	N/A	Jul-08-13	
Thorium, dissolved	< 0.001		0.001	mg/L	N/A	Jul-08-13	
Tin, dissolved	< 0.002		0.002	mg/L	N/A	Jul-08-13	
Titanium, dissolved	< 0.05		0.05	mg/L	N/A	Jul-08-13	
Uranium, dissolved	0.0011		0.0002	mg/L	N/A	Jul-08-13	
Vanadium, dissolved	< 0.01		0.01	mg/L	N/A	Jul-08-13	
Zinc, dissolved	< 0.04		0.04	mg/L	N/A	Jul-08-13	
Zirconium, dissolved	< 0.001		0.001	mg/L	N/A	Jul-08-13	

Total Recoverable Metals

Sample ID: Bear Creek (3070250-01) [Water] Sampled: Jul-03-13 12:47

Aluminum, total	< 0.05	AO ≤ 0.1	0.05	mg/L	Jul-08-13	Jul-08-13	
Antimony, total	< 0.001	MAC = 0.006	0.001	mg/L	Jul-08-13	Jul-08-13	
Arsenic, total	< 0.005	MAC = 0.01	0.005	mg/L	Jul-08-13	Jul-08-13	
Barium, total	< 0.05	MAC = 1	0.05	mg/L	Jul-08-13	Jul-08-13	
Beryllium, total	< 0.001		0.001	mg/L	Jul-08-13	Jul-08-13	
Bismuth, total	< 0.001		0.001	mg/L	Jul-08-13	Jul-08-13	
Boron, total	< 0.04	MAC = 5	0.04	mg/L	Jul-08-13	Jul-08-13	
Cadmium, total	< 0.0001	MAC = 0.005	0.0001	mg/L	Jul-08-13	Jul-08-13	
Calcium, total	30		2	mg/L	Jul-08-13	Jul-08-13	
Chromium, total	< 0.005	MAC = 0.05	0.005	mg/L	Jul-08-13	Jul-08-13	
Cobalt, total	< 0.0005		0.0005	mg/L	Jul-08-13	Jul-08-13	
Copper, total	< 0.002	AO ≤ 1	0.002	mg/L	Jul-08-13	Jul-08-13	
Iron, total	< 0.1	AO ≤ 0.3	0.1	mg/L	Jul-08-13	Jul-08-13	
Lead, total	< 0.001	MAC = 0.01	0.001	mg/L	Jul-08-13	Jul-08-13	
Lithium, total	< 0.001		0.001	mg/L	Jul-08-13	Jul-08-13	
Magnesium, total	4.1		0.1	mg/L	Jul-08-13	Jul-08-13	
Manganese, total	< 0.002	AO ≤ 0.05	0.002	mg/L	Jul-08-13	Jul-08-13	
Mercury, total	< 0.0002	MAC = 0.001	0.0002	mg/L	Jul-08-13	Jul-08-13	
Molybdenum, total	0.001		0.001	mg/L	Jul-08-13	Jul-08-13	
Nickel, total	< 0.002		0.002	mg/L	Jul-08-13	Jul-08-13	

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Total Recoverable Metals, Continued

Sample ID: Bear Creek (3070250-01) [Water] Sampled: Jul-03-13 12:47, Continued

Phosphorus, total	< 0.2		0.2	mg/L	Jul-08-13	Jul-08-13	
Potassium, total	1.2		0.2	mg/L	Jul-08-13	Jul-08-13	
Selenium, total	< 0.005	MAC = 0.01	0.005	mg/L	Jul-08-13	Jul-08-13	
Silicon, total	7		5	mg/L	Jul-08-13	Jul-08-13	
Silver, total	< 0.0005		0.0005	mg/L	Jul-08-13	Jul-08-13	
Sodium, total	3.6	AO ≤ 200	0.2	mg/L	Jul-08-13	Jul-08-13	
Strontium, total	0.17		0.01	mg/L	Jul-08-13	Jul-08-13	
Sulfur, total	< 10		10	mg/L	Jul-08-13	Jul-08-13	
Tellurium, total	< 0.002		0.002	mg/L	Jul-08-13	Jul-08-13	
Thallium, total	< 0.0002		0.0002	mg/L	Jul-08-13	Jul-08-13	
Thorium, total	< 0.001		0.001	mg/L	Jul-08-13	Jul-08-13	
Tin, total	< 0.002		0.002	mg/L	Jul-08-13	Jul-08-13	
Titanium, total	< 0.05		0.05	mg/L	Jul-08-13	Jul-08-13	
Uranium, total	0.0011	MAC = 0.02	0.0002	mg/L	Jul-08-13	Jul-08-13	
Vanadium, total	< 0.01		0.01	mg/L	Jul-08-13	Jul-08-13	
Zinc, total	< 0.04	AO ≤ 5	0.04	mg/L	Jul-08-13	Jul-08-13	
Zirconium, total	< 0.001		0.001	mg/L	Jul-08-13	Jul-08-13	