

REPORTED TO Black Mountain Irrigation District
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ATTENTION BMID Reports

WORK ORDER 6120903

PO NUMBER

RECEIVED / TEMP 2016-12-13 09:00 / 5°C

PROJECT Comprehensive

REPORTED 2016-12-20

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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Analysis Description	Method Reference	Technique	Location
Alkalinity in Water	APHA 2320 B*	Titration with H2SO4	Kelowna
Anions by IC in Water	APHA 4110 B	Ion Chromatography with Chemical Suppression of Eluent Conductivity	Kelowna
Coliforms, Total (MF-CCA) in Water	APHA 9222*	Membrane Filtration / Incubation on Chromocult Agar	Kelowna
Colour, True in Water	APHA 2120 C	Spectrophotometry (456 nm)	Kelowna
Conductivity in Water	APHA 2510 B	Conductivity Meter	Kelowna
Cyanide, SAD in Water	ASTM D7511-12	Flow Injection Analysis with In-Line Ultraviolet Digestion and Amperometric Detection	Kelowna
E. coli (MF-CCA) in Water	APHA 9222*	Membrane Filtration / Incubation on Chromocult Agar	Kelowna
Hardness (as CaCO3) in Water	APHA 2340 B*	Calculation: 2.497 [total Ca] + 4.118 [total Mg] (Estimated)	N/A
Langelier Index in Water	APHA 2330 B	Calculation	N/A
Mercury, total by CVAFS in Water	EPA 245.7*	BrCl2 Oxidation / Cold Vapor Atomic Fluorescence Spectrometry (CVAFS)	Richmond
pH in Water	APHA 4500-H+ B	Electrometry	Kelowna
Solids, Total Dissolved (calc) in Water	APHA 1030 E	Calculation: 100 x ([Cations]-[Anions])/([Cations]+[Anions])	N/A
Temperature (lab) in Water	APHA 2550 B	Thermometer	Kelowna
Total Metals by ICPMS in Water	APHA 3030E* / APHA 3125 B	HNO3+HCl Hot Block Digestion / Inductively Coupled Plasma Mass Spectrometry (ICP-MS)	Richmond
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
 ASTM ASTM International Test Methods
 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
 °C Degrees Celcius
 CFU/100 mL Colony Forming Units per 100 millilitres
 CU Colour Units (referenced against a platinum cobalt standard)
 mg/L Milligrams per litre
 NTU Nephelometric Turbidity Units
 pH units pH < 7 = acidic, pH > 7 = basic
 µS/cm Microsiemens per centimetre

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Analyte	Result / Recovery	MRL / Limits	Units	Prepared	Analyzed	Notes
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Sample ID: Booster #1 (6120903-01) [Water] Sampled: 2016-12-13 08:42

Anions

Chloride	9.35	0.10	mg/L	N/A	2016-12-15	
Fluoride	< 0.10	0.10	mg/L	N/A	2016-12-15	
Nitrate (as N)	0.011	0.010	mg/L	N/A	2016-12-15	
Nitrite (as N)	< 0.010	0.010	mg/L	N/A	2016-12-15	
Sulfate	4.2	1.0	mg/L	N/A	2016-12-15	

General Parameters

Alkalinity, Total (as CaCO3)	30	2	mg/L	N/A	2016-12-14	
Alkalinity, Phenolphthalein (as CaCO3)	< 1	2	mg/L	N/A	2016-12-14	
Alkalinity, Bicarbonate (as CaCO3)	30	2	mg/L	N/A	2016-12-14	
Alkalinity, Carbonate (as CaCO3)	< 1	2	mg/L	N/A	2016-12-14	
Alkalinity, Hydroxide (as CaCO3)	< 1	2	mg/L	N/A	2016-12-14	
Colour, True	< 5	5	CU	N/A	2016-12-14	
Conductivity (EC)	102	2	µS/cm	N/A	2016-12-14	
Cyanide, Total	< 0.0020	0.0020	mg/L	N/A	2016-12-14	
pH	7.19	0.01	pH units	N/A	2016-12-14	HT2
Temperature	20		°C	N/A	2016-12-14	HT2
Turbidity	0.48	0.10	NTU	N/A	2016-12-14	

Calculated Parameters

Hardness, Total (as CaCO3)	41.2	0.50	mg/L	N/A	N/A	
Langelier Index	-1.8	-5.0	-	N/A	2016-12-20	
Solids, Total Dissolved (calc)	50.2	1.00	mg/L	N/A	N/A	

Total Metals

Aluminum, total	0.125	0.005	mg/L	2016-12-15	2016-12-16	
Antimony, total	< 0.0001	0.0001	mg/L	2016-12-15	2016-12-16	
Arsenic, total	< 0.0005	0.0005	mg/L	2016-12-15	2016-12-16	
Barium, total	0.009	0.005	mg/L	2016-12-15	2016-12-16	
Boron, total	0.008	0.004	mg/L	2016-12-15	2016-12-16	
Cadmium, total	< 0.00001	0.00001	mg/L	2016-12-15	2016-12-16	
Calcium, total	11.6	0.2	mg/L	2016-12-15	2016-12-16	
Chromium, total	< 0.0005	0.0005	mg/L	2016-12-15	2016-12-16	
Cobalt, total	< 0.00005	0.00005	mg/L	2016-12-15	2016-12-16	
Copper, total	0.0014	0.0002	mg/L	2016-12-15	2016-12-16	
Iron, total	0.04	0.01	mg/L	2016-12-15	2016-12-16	
Lead, total	< 0.0001	0.0001	mg/L	2016-12-15	2016-12-16	
Magnesium, total	2.98	0.01	mg/L	2016-12-15	2016-12-16	
Manganese, total	0.0068	0.0002	mg/L	2016-12-15	2016-12-16	
Mercury, total	< 0.00002	0.00002	mg/L	2016-12-18	2016-12-19	
Molybdenum, total	0.0006	0.0001	mg/L	2016-12-15	2016-12-16	
Nickel, total	0.0005	0.0002	mg/L	2016-12-15	2016-12-16	
Potassium, total	0.68	0.02	mg/L	2016-12-15	2016-12-16	
Selenium, total	< 0.0005	0.0005	mg/L	2016-12-15	2016-12-16	
Sodium, total	3.14	0.02	mg/L	2016-12-15	2016-12-16	
Uranium, total	0.00012	0.00002	mg/L	2016-12-15	2016-12-16	
Zinc, total	< 0.004	0.004	mg/L	2016-12-15	2016-12-16	

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Sample ID: Booster #1 (6120903-01) [Water] Sampled: 2016-12-13 08:42, Continued

Microbiological Parameters

Coliforms, Total	< 1	1	CFU/100 mL	N/A	2016-12-14	
E. coli	< 1	1	CFU/100 mL	N/A	2016-12-14	

Sample ID: Well 5 (6120903-02) [Water] Sampled: 2016-12-13 08:15

Anions

Chloride	11.3	0.10	mg/L	N/A	2016-12-15	
Fluoride	< 0.10	0.10	mg/L	N/A	2016-12-15	
Nitrate (as N)	4.17	0.010	mg/L	N/A	2016-12-15	
Nitrite (as N)	< 0.010	0.010	mg/L	N/A	2016-12-15	
Sulfate	24.7	1.0	mg/L	N/A	2016-12-15	

General Parameters

Alkalinity, Total (as CaCO3)	212	2	mg/L	N/A	2016-12-14	
Alkalinity, Phenolphthalein (as CaCO3)	< 1	2	mg/L	N/A	2016-12-14	
Alkalinity, Bicarbonate (as CaCO3)	212	2	mg/L	N/A	2016-12-14	
Alkalinity, Carbonate (as CaCO3)	< 1	2	mg/L	N/A	2016-12-14	
Alkalinity, Hydroxide (as CaCO3)	< 1	2	mg/L	N/A	2016-12-14	
Colour, True	< 5	5	CU	N/A	2016-12-14	
Conductivity (EC)	507	2	µS/cm	N/A	2016-12-14	
Cyanide, Total	< 0.0020	0.0020	mg/L	N/A	2016-12-14	
pH	7.83	0.01	pH units	N/A	2016-12-14	HT2
Temperature	21		°C	N/A	2016-12-14	HT2
Turbidity	0.43	0.10	NTU	N/A	2016-12-14	

Calculated Parameters

Hardness, Total (as CaCO3)	248	0.50	mg/L	N/A	N/A	
Langelier Index	0.6	-5.0	-	N/A	2016-12-20	
Solids, Total Dissolved (calc)	286	1.00	mg/L	N/A	N/A	

Total Metals

Aluminum, total	< 0.005	0.005	mg/L	2016-12-15	2016-12-16	
Antimony, total	< 0.0001	0.0001	mg/L	2016-12-15	2016-12-16	
Arsenic, total	< 0.0005	0.0005	mg/L	2016-12-15	2016-12-16	
Barium, total	0.022	0.005	mg/L	2016-12-15	2016-12-16	
Boron, total	0.025	0.004	mg/L	2016-12-15	2016-12-16	
Cadmium, total	0.00001	0.00001	mg/L	2016-12-15	2016-12-16	
Calcium, total	74.5	0.2	mg/L	2016-12-15	2016-12-16	
Chromium, total	< 0.0005	0.0005	mg/L	2016-12-15	2016-12-16	
Cobalt, total	< 0.00005	0.00005	mg/L	2016-12-15	2016-12-16	
Copper, total	0.0074	0.0002	mg/L	2016-12-15	2016-12-16	
Iron, total	< 0.01	0.01	mg/L	2016-12-15	2016-12-16	
Lead, total	0.0004	0.0001	mg/L	2016-12-15	2016-12-16	
Magnesium, total	15.1	0.01	mg/L	2016-12-15	2016-12-16	
Manganese, total	0.0004	0.0002	mg/L	2016-12-15	2016-12-16	
Mercury, total	< 0.00002	0.00002	mg/L	2016-12-18	2016-12-19	
Molybdenum, total	0.0016	0.0001	mg/L	2016-12-15	2016-12-16	

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Sample ID: Well 5 (6120903-02) [Water] Sampled: 2016-12-13 08:15, Continued

Total Metals, Continued

Nickel, total	0.0010	0.0002	mg/L	2016-12-15	2016-12-16	
Potassium, total	2.10	0.02	mg/L	2016-12-15	2016-12-16	
Selenium, total	0.0020	0.0005	mg/L	2016-12-15	2016-12-16	
Sodium, total	10.8	0.02	mg/L	2016-12-15	2016-12-16	
Uranium, total	0.00162	0.00002	mg/L	2016-12-15	2016-12-16	
Zinc, total	0.019	0.004	mg/L	2016-12-15	2016-12-16	

Microbiological Parameters

Coliforms, Total	< 1	1	CFU/100 mL	N/A	2016-12-14	
E. coli	< 1	1	CFU/100 mL	N/A	2016-12-14	

Sample / Analysis Qualifiers:

HT2 The 15 minute recommended holding time (from sampling to analysis) has been exceeded - field analysis is recommended.