

REPORTED TO Keremeos Irrigation District
Box 220
Keremeos, BC V0X 1N0

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ATTENTION Jo Cottrill

WORK ORDER 7060173

PO NUMBER

RECEIVED / TEMP 2017-06-02 09:35 / 7°C

PROJECT General Potability

REPORTED 2017-06-09

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 3030 E* / 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
 AO Aesthetic objective
 MAC Maximum acceptable concentration (health based)
 OG Operational guideline (treated water)
 °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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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

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: Red Bridge 30 hp (7060173-01) [Water] Sampled: 2017-06-01 14:20

Anions

Chloride	3.82	AO ≤ 250	0.10	mg/L	N/A	2017-06-05	
Fluoride	< 0.10	MAC = 1.5	0.10	mg/L	N/A	2017-06-04	
Nitrate (as N)	0.172	MAC = 10	0.010	mg/L	N/A	2017-06-04	
Nitrite (as N)	< 0.010	MAC = 1	0.010	mg/L	N/A	2017-06-04	
Sulfate	16.0	AO ≤ 500	1.0	mg/L	N/A	2017-06-04	

General Parameters

Alkalinity, Total (as CaCO3)	83.5	N/A	2.0	mg/L	N/A	2017-06-06	
Alkalinity, Phenolphthalein (as CaCO3)	< 1.0	N/A	2.0	mg/L	N/A	2017-06-06	
Alkalinity, Bicarbonate (as CaCO3)	83.5	N/A	2.0	mg/L	N/A	2017-06-06	
Alkalinity, Carbonate (as CaCO3)	< 1.0	N/A	2.0	mg/L	N/A	2017-06-06	
Alkalinity, Hydroxide (as CaCO3)	< 1.0	N/A	2.0	mg/L	N/A	2017-06-06	
Colour, True	< 5.0	AO ≤ 15	5.0	CU	N/A	2017-06-02	
Conductivity (EC)	207	N/A	2.0	µS/cm	N/A	2017-06-06	
Cyanide, Total	< 0.0020	MAC = 0.2	0.0020	mg/L	N/A	2017-06-06	
pH	6.88	7-10.5	0.01	pH units	N/A	2017-06-06	HT2
Temperature, at pH	21	N/A		°C	N/A	2017-06-06	HT2
Turbidity	< 0.10	OG < 0.1	0.10	NTU	N/A	2017-06-02	

Calculated Parameters

Hardness, Total (as CaCO3)	90.9	N/A	0.500	mg/L	N/A	N/A	
Langelier Index	-1.2	N/A	-5.0	-	N/A	2017-06-09	
Solids, Total Dissolved (calc)	110	N/A	1.00	mg/L	N/A	N/A	

Total Metals

Aluminum, total	< 0.0050	OG < 0.1	0.0050	mg/L	2017-06-05	2017-06-05	
Antimony, total	< 0.00010	MAC = 0.006	0.00010	mg/L	2017-06-05	2017-06-05	
Arsenic, total	0.00050	MAC = 0.01	0.00050	mg/L	2017-06-05	2017-06-05	
Barium, total	0.0284	MAC = 1	0.0050	mg/L	2017-06-05	2017-06-05	
Boron, total	0.012	MAC = 5	0.004	mg/L	2017-06-05	2017-06-05	
Cadmium, total	< 0.000010	MAC = 0.005	0.000010	mg/L	2017-06-05	2017-06-05	
Calcium, total	28.9	N/A	0.20	mg/L	2017-06-05	2017-06-05	
Chromium, total	< 0.00050	MAC = 0.05	0.00050	mg/L	2017-06-05	2017-06-05	
Cobalt, total	< 0.00010	N/A	0.00010	mg/L	2017-06-05	2017-06-05	
Copper, total	0.00176	AO ≤ 1	0.00020	mg/L	2017-06-05	2017-06-05	
Iron, total	< 0.010	AO ≤ 0.3	0.010	mg/L	2017-06-05	2017-06-05	
Lead, total	< 0.00010	MAC = 0.01	0.00010	mg/L	2017-06-05	2017-06-05	
Magnesium, total	4.54	N/A	0.010	mg/L	2017-06-05	2017-06-05	
Manganese, total	< 0.00020	AO ≤ 0.05	0.00020	mg/L	2017-06-05	2017-06-05	
Mercury, total	< 0.00002	MAC = 0.001	0.00002	mg/L	2017-06-08	2017-06-08	
Molybdenum, total	0.00137	N/A	0.00010	mg/L	2017-06-05	2017-06-05	
Nickel, total	< 0.00020	N/A	0.00020	mg/L	2017-06-05	2017-06-05	
Potassium, total	1.01	N/A	0.02	mg/L	2017-06-05	2017-06-05	
Selenium, total	< 0.00050	MAC = 0.05	0.00050	mg/L	2017-06-05	2017-06-05	
Sodium, total	4.52	AO ≤ 200	0.02	mg/L	2017-06-05	2017-06-05	
Uranium, total	0.000474	MAC = 0.02	0.000020	mg/L	2017-06-05	2017-06-05	
Zinc, total	< 0.0040	AO ≤ 5	0.0040	mg/L	2017-06-05	2017-06-05	

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Analyte	Result / Recovery	Standard / Guideline	MRL / Limits	Units	Prepared	Analyzed	Notes
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Sample ID: Red Bridge 30 hp (7060173-01) [Water] Sampled: 2017-06-01 14:20, Continued

Microbiological Parameters

Coliforms, Total	< 1	MAC = None Detected	1	CFU/100 mL	N/A	2017-06-02	
E. coli	< 1	MAC = None Detected	1	CFU/100 mL	N/A	2017-06-02	

Sample ID: West Station #3 (7060173-02) [Water] Sampled: 2017-06-01 14:40

Anions

Chloride	13.2	AO ≤ 250	0.10	mg/L	N/A	2017-06-05	
Fluoride	< 0.10	MAC = 1.5	0.10	mg/L	N/A	2017-06-04	
Nitrate (as N)	1.72	MAC = 10	0.010	mg/L	N/A	2017-06-04	
Nitrite (as N)	< 0.010	MAC = 1	0.010	mg/L	N/A	2017-06-04	
Sulfate	99.1	AO ≤ 500	1.0	mg/L	N/A	2017-06-05	

General Parameters

Alkalinity, Total (as CaCO ₃)	211	N/A	2.0	mg/L	N/A	2017-06-06	
Alkalinity, Phenolphthalein (as CaCO ₃)	< 1.0	N/A	2.0	mg/L	N/A	2017-06-06	
Alkalinity, Bicarbonate (as CaCO ₃)	211	N/A	2.0	mg/L	N/A	2017-06-06	
Alkalinity, Carbonate (as CaCO ₃)	< 1.0	N/A	2.0	mg/L	N/A	2017-06-06	
Alkalinity, Hydroxide (as CaCO ₃)	< 1.0	N/A	2.0	mg/L	N/A	2017-06-06	
Colour, True	< 5.0	AO ≤ 15	5.0	CU	N/A	2017-06-02	
Conductivity (EC)	613	N/A	2.0	µS/cm	N/A	2017-06-06	
Cyanide, Total	< 0.0020	MAC = 0.2	0.0020	mg/L	N/A	2017-06-06	
pH	7.79	7-10.5	0.01	pH units	N/A	2017-06-06	HT2
Temperature, at pH	22	N/A		°C	N/A	2017-06-06	HT2
Turbidity	0.15	OG < 0.1	0.10	NTU	N/A	2017-06-02	

Calculated Parameters

Hardness, Total (as CaCO ₃)	296	N/A	0.500	mg/L	N/A	N/A	
Langelier Index	0.6	N/A	-5.0	-	N/A	2017-06-09	
Solids, Total Dissolved (calc)	375	N/A	10.0	mg/L	N/A	N/A	

Total Metals

Aluminum, total	< 0.0050	OG < 0.1	0.0050	mg/L	2017-06-05	2017-06-05	
Antimony, total	< 0.00010	MAC = 0.006	0.00010	mg/L	2017-06-05	2017-06-05	
Arsenic, total	0.00266	MAC = 0.01	0.00050	mg/L	2017-06-05	2017-06-05	
Barium, total	0.0353	MAC = 1	0.0050	mg/L	2017-06-05	2017-06-05	
Boron, total	0.027	MAC = 5	0.004	mg/L	2017-06-05	2017-06-05	
Cadmium, total	0.000019	MAC = 0.005	0.000010	mg/L	2017-06-05	2017-06-05	
Calcium, total	90.4	N/A	0.20	mg/L	2017-06-05	2017-06-05	
Chromium, total	< 0.00050	MAC = 0.05	0.00050	mg/L	2017-06-05	2017-06-05	
Cobalt, total	< 0.00010	N/A	0.00010	mg/L	2017-06-05	2017-06-05	
Copper, total	0.00130	AO ≤ 1	0.00020	mg/L	2017-06-05	2017-06-05	
Iron, total	< 0.010	AO ≤ 0.3	0.010	mg/L	2017-06-05	2017-06-05	
Lead, total	< 0.00010	MAC = 0.01	0.00010	mg/L	2017-06-05	2017-06-05	
Magnesium, total	16.9	N/A	0.010	mg/L	2017-06-05	2017-06-05	
Manganese, total	0.00069	AO ≤ 0.05	0.00020	mg/L	2017-06-05	2017-06-05	

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Sample ID: West Station #3 (7060173-02) [Water] Sampled: 2017-06-01 14:40, Continued

Total Metals, Continued

Mercury, total	< 0.00002	MAC = 0.001	0.00002	mg/L	2017-06-08	2017-06-08	
Molybdenum, total	0.00340	N/A	0.00010	mg/L	2017-06-05	2017-06-05	
Nickel, total	0.00061	N/A	0.00020	mg/L	2017-06-05	2017-06-05	
Potassium, total	3.25	N/A	0.02	mg/L	2017-06-05	2017-06-05	
Selenium, total	0.00146	MAC = 0.05	0.00050	mg/L	2017-06-05	2017-06-05	
Sodium, total	15.9	AO ≤ 200	0.02	mg/L	2017-06-05	2017-06-05	
Uranium, total	0.00283	MAC = 0.02	0.000020	mg/L	2017-06-05	2017-06-05	
Zinc, total	< 0.0040	AO ≤ 5	0.0040	mg/L	2017-06-05	2017-06-05	

Microbiological Parameters

Coliforms, Total	< 1	MAC = None Detected	1	CFU/100 mL	N/A	2017-06-02	
E. coli	< 1	MAC = None Detected	1	CFU/100 mL	N/A	2017-06-02	

Sample ID: #3 East Station (7060173-03) [Water] Sampled: 2017-06-01 15:00

Anions

Chloride	3.19	AO ≤ 250	0.10	mg/L	N/A	2017-06-05	
Fluoride	< 0.10	MAC = 1.5	0.10	mg/L	N/A	2017-06-04	
Nitrate (as N)	0.579	MAC = 10	0.010	mg/L	N/A	2017-06-04	
Nitrite (as N)	< 0.010	MAC = 1	0.010	mg/L	N/A	2017-06-04	
Sulfate	20.7	AO ≤ 500	1.0	mg/L	N/A	2017-06-04	

General Parameters

Alkalinity, Total (as CaCO ₃)	114	N/A	2.0	mg/L	N/A	2017-06-06	
Alkalinity, Phenolphthalein (as CaCO ₃)	< 1.0	N/A	2.0	mg/L	N/A	2017-06-06	
Alkalinity, Bicarbonate (as CaCO ₃)	114	N/A	2.0	mg/L	N/A	2017-06-06	
Alkalinity, Carbonate (as CaCO ₃)	< 1.0	N/A	2.0	mg/L	N/A	2017-06-06	
Alkalinity, Hydroxide (as CaCO ₃)	< 1.0	N/A	2.0	mg/L	N/A	2017-06-06	
Colour, True	< 5.0	AO ≤ 15	5.0	CU	N/A	2017-06-02	
Conductivity (EC)	244	N/A	2.0	µS/cm	N/A	2017-06-06	
Cyanide, Total	< 0.0020	MAC = 0.2	0.0020	mg/L	N/A	2017-06-06	
pH	7.38	7-10.5	0.01	pH units	N/A	2017-06-06	HT2
Temperature, at pH	22	N/A		°C	N/A	2017-06-06	HT2
Turbidity	< 0.10	OG < 0.1	0.10	NTU	N/A	2017-06-02	

Calculated Parameters

Hardness, Total (as CaCO ₃)	109	N/A	0.500	mg/L	N/A	N/A	
Langelier Index	-0.5	N/A	-5.0	-	N/A	2017-06-09	
Solids, Total Dissolved (calc)	142	N/A	1.00	mg/L	N/A	N/A	

Total Metals

Aluminum, total	< 0.0050	OG < 0.1	0.0050	mg/L	2017-06-05	2017-06-05	
Antimony, total	< 0.00010	MAC = 0.006	0.00010	mg/L	2017-06-05	2017-06-05	
Arsenic, total	0.00120	MAC = 0.01	0.00050	mg/L	2017-06-05	2017-06-05	
Barium, total	0.0315	MAC = 1	0.0050	mg/L	2017-06-05	2017-06-05	
Boron, total	0.017	MAC = 5	0.004	mg/L	2017-06-05	2017-06-05	

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Sample ID: #3 East Station (7060173-03) [Water] Sampled: 2017-06-01 15:00, Continued

Total Metals, Continued

Cadmium, total	< 0.000010	MAC = 0.005	0.000010	mg/L	2017-06-05	2017-06-05	
Calcium, total	34.3	N/A	0.20	mg/L	2017-06-05	2017-06-05	
Chromium, total	< 0.00050	MAC = 0.05	0.00050	mg/L	2017-06-05	2017-06-05	
Cobalt, total	< 0.00010	N/A	0.00010	mg/L	2017-06-05	2017-06-05	
Copper, total	0.00078	AO ≤ 1	0.00020	mg/L	2017-06-05	2017-06-05	
Iron, total	< 0.010	AO ≤ 0.3	0.010	mg/L	2017-06-05	2017-06-05	
Lead, total	< 0.00010	MAC = 0.01	0.00010	mg/L	2017-06-05	2017-06-05	
Magnesium, total	5.69	N/A	0.010	mg/L	2017-06-05	2017-06-05	
Manganese, total	< 0.00020	AO ≤ 0.05	0.00020	mg/L	2017-06-05	2017-06-05	
Mercury, total	< 0.00002	MAC = 0.001	0.00002	mg/L	2017-06-08	2017-06-08	
Molybdenum, total	0.00169	N/A	0.00010	mg/L	2017-06-05	2017-06-05	
Nickel, total	< 0.00020	N/A	0.00020	mg/L	2017-06-05	2017-06-05	
Potassium, total	1.32	N/A	0.02	mg/L	2017-06-05	2017-06-05	
Selenium, total	< 0.00050	MAC = 0.05	0.00050	mg/L	2017-06-05	2017-06-05	
Sodium, total	4.86	AO ≤ 200	0.02	mg/L	2017-06-05	2017-06-05	
Uranium, total	0.000573	MAC = 0.02	0.000020	mg/L	2017-06-05	2017-06-05	
Zinc, total	< 0.0040	AO ≤ 5	0.0040	mg/L	2017-06-05	2017-06-05	

Microbiological Parameters

Coliforms, Total	< 1	MAC = None Detected	1	CFU/100 mL	N/A	2017-06-02	
E. coli	< 1	MAC = None Detected	1	CFU/100 mL	N/A	2017-06-02	

Sample / Analysis Qualifiers:

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