



## CERTIFICATE OF ANALYSIS

**REPORTED TO** Black Mountain Irrigation District  
285 Gray Avenue  
KELOWNA, BC V1X 1W8

**ATTENTION** Bryan Vig

**PO NUMBER**  
**PROJECT** Screen Works/ Chemistry  
**PROJECT INFO**

**WORK ORDER** 23G1973

**RECEIVED / TEMP** 2023-07-17 12:44 / 18.3°C  
**REPORTED** 2023-07-24 09:34  
**COC NUMBER** No Number

### Introduction:

CARO Analytical Services is a testing laboratory full of smart, engaged scientists driven to make the world a safer and healthier place. Through our clients' projects we become an essential element for a better world. We employ methods conducted in accordance with recognized professional standards using accepted testing methodologies and quality control efforts. CARO is accredited by the Canadian Association for Laboratories Accreditation (CALA) to ISO/IEC 17025:2017 for specific tests listed in the scope of accreditation approved by CALA.

#### *Big Picture Sidekicks*



You know that the sample you collected after snowshoeing to site, digging 5 meters, and racing to get it on a plane so you can submit it to the lab for time sensitive results needed to make important and expensive decisions (whew) is VERY important. We know that too.

#### *We've Got Chemistry*



It's simple. We figure the more you enjoy working with our fun and engaged team members; the more likely you are to give us continued opportunities to support you.

#### *Ahead of the Curve*



Through research, regulation knowledge, and instrumentation, we are your analytical centre for the technical knowledge you need, BEFORE you need it, so you can stay up to date and in the know.

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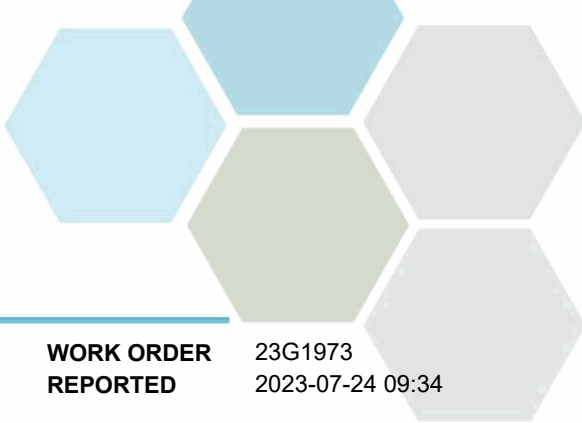
If you have any questions or concerns, please contact me at [bwhitehead@caro.ca](mailto:bwhitehead@caro.ca)

#### **Authorized By:**

Brent Whitehead  
Account Manager

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# TEST RESULTS

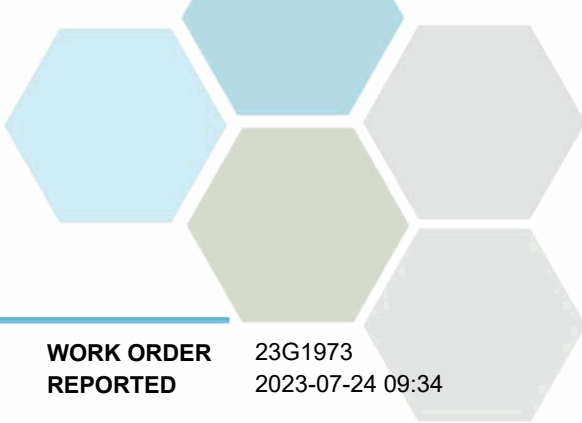
**REPORTED TO PROJECT** Black Mountain Irrigation District  
Screen Works/ Chemistry

**WORK ORDER REPORTED** 23G1973  
2023-07-24 09:34

Analyte	Result	RL	Units	Analyzed	Qualifier
<b>Screenworks (23G1973-01)   Matrix: Water   Sampled: 2023-07-17 10:16</b>					
<i>Field Parameters</i>					
Chlorine, Free	1.78	0.02	mg/L	2023-07-14	
Temperature, field	20.5		°C	2023-07-14	
<i>General Parameters</i>					
Alkalinity, Total (as CaCO3)	26.9	1.0	mg/L	2023-07-19	
Alkalinity, Phenolphthalein (as CaCO3)	< 1.0	1.0	mg/L	2023-07-19	
Alkalinity, Bicarbonate (as CaCO3)	26.9	1.0	mg/L	2023-07-19	
Alkalinity, Carbonate (as CaCO3)	< 1.0	1.0	mg/L	2023-07-19	
Alkalinity, Hydroxide (as CaCO3)	< 1.0	1.0	mg/L	2023-07-19	
Colour, True	< 5.0	5.0	CU	2023-07-18	
Conductivity (EC)	98.9	2.0	µS/cm	2023-07-19	
pH	7.08	0.10	pH units	2023-07-19	HT2
Turbidity	0.30	0.10	NTU	2023-07-18	
UV Transmittance @ 254nm	90.6	0.10	% T	2023-07-18	

**Well #5 (23G1973-02) | Matrix: Water | Sampled: 2023-07-17**

<i>Anions</i>					
Chloride	16.9	0.10	mg/L	2023-07-19	
Fluoride	< 0.10	0.10	mg/L	2023-07-19	
Nitrate (as N)	5.21	0.010	mg/L	2023-07-19	
Nitrite (as N)	< 0.010	0.010	mg/L	2023-07-19	
Sulfate	27.9	1.0	mg/L	2023-07-19	
<i>Calculated Parameters</i>					
Hardness, Total (as CaCO3)	233	0.500	mg/L	N/A	
Langelier Index	0.4	-5.0		2023-07-21	CST2
Solids, Total Dissolved	302	1.00	mg/L	N/A	
<i>Field Parameters</i>					
Chlorine, Free	0.78	0.02	mg/L	2023-07-14	
Temperature, field	11.6		°C	2023-07-14	
<i>General Parameters</i>					
Alkalinity, Total (as CaCO3)	223	1.0	mg/L	2023-07-19	
Alkalinity, Phenolphthalein (as CaCO3)	< 1.0	1.0	mg/L	2023-07-19	
Alkalinity, Bicarbonate (as CaCO3)	223	1.0	mg/L	2023-07-19	
Alkalinity, Carbonate (as CaCO3)	< 1.0	1.0	mg/L	2023-07-19	
Alkalinity, Hydroxide (as CaCO3)	< 1.0	1.0	mg/L	2023-07-19	
Colour, True	< 5.0	5.0	CU	2023-07-18	
Conductivity (EC)	521	2.0	µS/cm	2023-07-19	
Cyanide, Total	< 0.0020	0.0020	mg/L	2023-07-22	
pH	8.01	0.10	pH units	2023-07-19	HT2
Temperature, at pH	22.8		°C	2023-07-19	HT2



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Analyte	Result	RL	Units	Analyzed	Qualifier
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**Well #5 (23G1973-02) | Matrix: Water | Sampled: 2023-07-17, Continued**

**General Parameters, Continued**

Turbidity	< 0.10	0.10	NTU	2023-07-18	
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**Total Metals**

Aluminum, total	< 0.0050	0.0050	mg/L	2023-07-19	
Antimony, total	< 0.00020	0.00020	mg/L	2023-07-19	
Arsenic, total	< 0.00050	0.00050	mg/L	2023-07-19	
Barium, total	<b>0.0209</b>	0.0050	mg/L	2023-07-19	
Boron, total	< 0.0500	0.0500	mg/L	2023-07-19	
Cadmium, total	< 0.000010	0.000010	mg/L	2023-07-19	
Calcium, total	<b>68.3</b>	0.20	mg/L	2023-07-19	
Chromium, total	<b>0.00053</b>	0.00050	mg/L	2023-07-19	
Cobalt, total	< 0.00010	0.00010	mg/L	2023-07-19	
Copper, total	<b>0.00403</b>	0.00040	mg/L	2023-07-19	
Iron, total	< 0.010	0.010	mg/L	2023-07-19	
Lead, total	< 0.00020	0.00020	mg/L	2023-07-19	
Magnesium, total	<b>15.2</b>	0.010	mg/L	2023-07-19	
Manganese, total	< 0.00020	0.00020	mg/L	2023-07-19	
Mercury, total	< 0.000010	0.000010	mg/L	2023-07-21	
Molybdenum, total	<b>0.00189</b>	0.00010	mg/L	2023-07-19	
Nickel, total	< 0.00040	0.00040	mg/L	2023-07-19	
Potassium, total	<b>2.12</b>	0.10	mg/L	2023-07-19	
Selenium, total	<b>0.00132</b>	0.00050	mg/L	2023-07-19	
Sodium, total	<b>12.8</b>	0.10	mg/L	2023-07-19	
Strontium, total	<b>0.335</b>	0.0010	mg/L	2023-07-19	
Uranium, total	<b>0.00233</b>	0.000020	mg/L	2023-07-19	
Zinc, total	< 0.0040	0.0040	mg/L	2023-07-19	

**Pearson (23G1973-03) | Matrix: Water | Sampled: 2023-07-17**

**Anions**

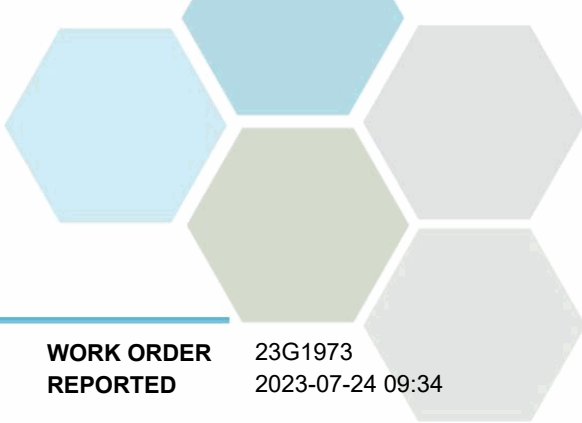
Chloride	<b>13.9</b>	0.10	mg/L	2023-07-19	
Fluoride	< 0.10	0.10	mg/L	2023-07-19	
Nitrate (as N)	< 0.010	0.010	mg/L	2023-07-19	
Nitrite (as N)	< 0.010	0.010	mg/L	2023-07-19	
Sulfate	<b>2.5</b>	1.0	mg/L	2023-07-19	

**Calculated Parameters**

Hardness, Total (as CaCO3)	<b>30.1</b>	0.500	mg/L	N/A	
Langelier Index	<b>-2.5</b>	-5.0		2023-07-21	CST2
Solids, Total Dissolved	<b>50.8</b>	1.00	mg/L	N/A	

**Field Parameters**

Chlorine, Free	< 0.02	0.02	mg/L	2023-07-17	
Temperature, field	<b>0.0</b>		°C	2023-07-17	



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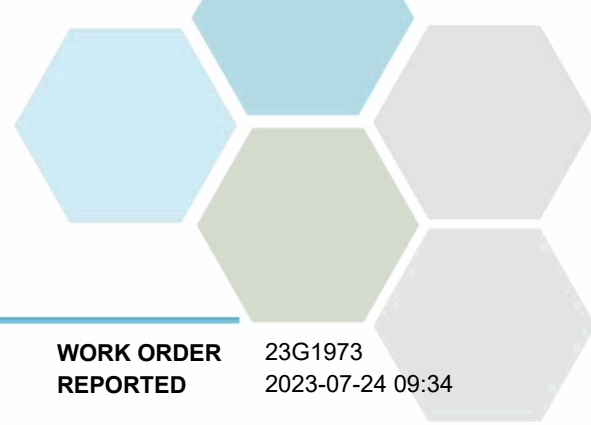
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Analyte	Result	RL	Units	Analyzed	Qualifier
<b>Pearson (23G1973-03)   Matrix: Water   Sampled: 2023-07-17, Continued</b>					
<b>General Parameters</b>					
Alkalinity, Total (as CaCO3)	26.3	1.0	mg/L	2023-07-19	
Alkalinity, Phenolphthalein (as CaCO3)	< 1.0	1.0	mg/L	2023-07-19	
Alkalinity, Bicarbonate (as CaCO3)	26.3	1.0	mg/L	2023-07-19	
Alkalinity, Carbonate (as CaCO3)	< 1.0	1.0	mg/L	2023-07-19	
Alkalinity, Hydroxide (as CaCO3)	< 1.0	1.0	mg/L	2023-07-19	
Colour, True	< 5.0	5.0	CU	2023-07-18	
Conductivity (EC)	99.5	2.0	µS/cm	2023-07-19	
Cyanide, Total	< 0.0020	0.0020	mg/L	2023-07-22	
pH	7.12	0.10	pH units	2023-07-19	HT2
Temperature, at pH	22.7		°C	2023-07-19	HT2
Turbidity	0.33	0.10	NTU	2023-07-18	
<b>Total Metals</b>					
Aluminum, total	0.202	0.0050	mg/L	2023-07-19	
Antimony, total	< 0.00020	0.00020	mg/L	2023-07-19	
Arsenic, total	< 0.00050	0.00050	mg/L	2023-07-19	
Barium, total	0.0076	0.0050	mg/L	2023-07-19	
Boron, total	< 0.0500	0.0500	mg/L	2023-07-19	
Cadmium, total	< 0.000010	0.000010	mg/L	2023-07-19	
Calcium, total	8.73	0.20	mg/L	2023-07-19	
Chromium, total	< 0.00050	0.00050	mg/L	2023-07-19	
Cobalt, total	< 0.00010	0.00010	mg/L	2023-07-19	
Copper, total	0.00166	0.00040	mg/L	2023-07-19	
Iron, total	< 0.010	0.010	mg/L	2023-07-19	
Lead, total	< 0.00020	0.00020	mg/L	2023-07-19	
Magnesium, total	2.01	0.010	mg/L	2023-07-19	
Manganese, total	0.00353	0.00020	mg/L	2023-07-19	
Mercury, total	< 0.000010	0.000010	mg/L	2023-07-21	
Molybdenum, total	0.00047	0.00010	mg/L	2023-07-19	
Nickel, total	< 0.00040	0.00040	mg/L	2023-07-19	
Potassium, total	0.73	0.10	mg/L	2023-07-19	
Selenium, total	< 0.00050	0.00050	mg/L	2023-07-19	
Sodium, total	6.87	0.10	mg/L	2023-07-19	
Strontium, total	0.0526	0.0010	mg/L	2023-07-19	
Uranium, total	0.000030	0.000020	mg/L	2023-07-19	
Zinc, total	< 0.0040	0.0040	mg/L	2023-07-19	

**Sample Qualifiers:**

- CST2 Results based on field temperature and lab ph.
- HT2 The 15 minute recommended holding time (from sampling to analysis) has been exceeded - field analysis is recommended.



## APPENDIX 1: SUPPORTING INFORMATION

**REPORTED TO PROJECT** Black Mountain Irrigation District  
Screen Works/ Chemistry

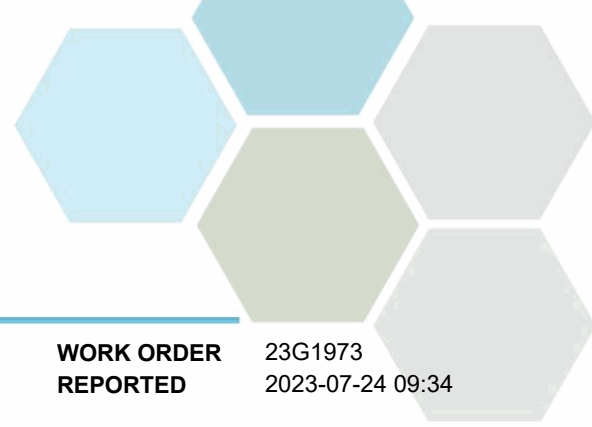
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Analysis Description	Method Ref.	Technique	Accredited	Location
Alkalinity in Water	SM 2320 B* (2021)	Titration with H2SO4	✓	Kelowna
Anions in Water	SM 4110 B (2020)	Ion Chromatography	✓	Kelowna
Colour, True in Water	SM 2120 C (2021)	Spectrophotometry (456 nm)	✓	Kelowna
Conductivity in Water	SM 2510 B (2021)	Conductivity Meter	✓	Kelowna
Cyanide, SAD in Water	ASTM D7511-12	Flow Injection with In-Line UV Digestion and Amperometry	✓	Kelowna
Hardness in Water	SM 2340 B* (2021)	Calculation: 2.497 [total Ca] + 4.118 [total Mg] (Est)	✓	N/A
Langelier Index in Water	SM 2330 B (2021)	Calculation		N/A
Mercury, total in Water	EPA 245.7*	BrCl2 Oxidation / Cold Vapor Atomic Fluorescence Spectrometry (CVAFS)	✓	Richmond
pH in Water	SM 4500-H+ B (2021)	Electrometry	✓	Kelowna
Solids, Total Dissolved in Water	SM 1030 E (2021)	SM 1030 E		N/A
Total Metals in Water	EPA 200.2 / EPA 6020B	HNO3+HCl Hot Block Digestion / Inductively Coupled Plasma-Mass Spectroscopy (ICP-MS)	✓	Richmond
Transmittance at 254 nm in Water	SM 5910 B* (2021)	Ultraviolet Absorption	✓	Kelowna
Turbidity in Water	SM 2130 B (2020)	Nephelometry	✓	Kelowna

*Note: An asterisk in the Method Reference indicates that the CARO method has been modified from the reference method*

### Glossary of Terms:

RL	Reporting Limit (default)
% T	Percent Transmittance
<	Less than the specified Reporting Limit (RL) - the actual RL may be higher than the default RL due to various factors
°C	Degrees Celcius
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
ASTM	ASTM International Test Methods
EPA	United States Environmental Protection Agency Test Methods
SM	Standard Methods for the Examination of Water and Wastewater, American Public Health Association



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**General Comments:**

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