

Annual Report of Monitoring Erickson Water System

Developed in accordance with the
British Columbia Drinking Water Protection Act

ERICKSON WATER SYSTEM	
Period of Monitoring Covered by this Report:	January 1 - December 31, 2024
Interior Health Permit to Operate Facility Number:	12-098-00381
EOCP Classification:	WD-II (Erickson) / WT-II (Arrow Creek)
IHA Permit:	Drinking Water System 301 - 10,000 Connections
Location of Water Supply System:	Erickson, BC

Contact Information:

Regional District of Central Kootenay
Box 590, 202 Lakeside Drive
Nelson, BC V1L 5R4
PH: (250) 352-8171
Email: WaterContact@rdck.bc.ca

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1. Introduction

The Erickson water system is located in Erickson just outside the eastern border of Creston, crossing the boundary of RDCK Electoral Areas B and C. The system services approximately 700 active connections and is the largest of the water systems managed by the RDCK. The Erickson Water System consists of two older systems: Erickson Irrigation District with source water from Sullivan Creek, and the East Creston Irrigation District established in 1929 with source water from Arrow Creek. The two Irrigation Districts combined in 1980 to become the Erickson Improvement District. In 2003, the Ministry of Municipal Affairs dissolved the system's Board of Trustees and the system was converted to a RDCK service with a new treatment plant constructed on Arrow Creek in 2005.

As part of the British Columbia Provincial *Drinking Water Protection Act (2001)* and *Drinking Water Protection Regulation (2003)* an annual water system report to water users is required. This annual report summarizes information collected and recorded throughout the reporting period, and details additional relevant information to the water system.

2. Water Treatment Objectives

The provincial technical document *Drinking Water Treatment objectives (Microbiological) for Surface Water Supplies in British Columbia (2012)* provides performance targets for water suppliers to ensure the provision of biologically safe drinking water. Interior Health supports water suppliers to meet these objectives as risk to human health is substantially reduced. The general treatment objectives are:

- 4-log (99.99%) removal/inactivation of viruses
- 3-log (99.9%) removal/inactivation of Giardia and Cryptosporidium (oocysts)
- Two separate treatment processes (multi-barrier) for surface water supplies
- Turbidity less than 1 NTU (Nephelometric Turbidity Unit)
- Zero total and fecal coliforms (E. coli)

The Erickson/Arrow Creek water treatment plant provides biologically safe drinking water to its users and achieves the above listed treatment objectives through various system components installed and maintained at the water treatment plant.

3. Water System Overview

The Erickson Water System derives source water from Arrow Creek, which is classified as a Community Watershed. In 2005 a new water treatment plant was commissioned on Arrow Creek. This plant now serves the Erickson community as well as the Town of Creston. The treatment process begins with coarse screening, settling, and fine screening to reduce turbidity. Following this is membrane filtration for further turbidity reduction and physical removal of some microbiological components. Ultraviolet (UV) disinfection and chemical disinfection by chlorination are final treatments for microbiological components prior to water being released into the distribution system. A Supervisory Control and Data Acquisition (SCADA) system allows for remote plant monitoring, alarming, and operation.

4. Monitoring

The Erickson/Arrow Creek water system includes monitoring for bacteriological testing (total/fecal coliforms), turbidity, chlorine residual (free and total), consumption, and chemical constituents.

4.1 Bacteriological

Sampling is done from various locations within the distribution system. In addition to the certified lab sample testing, RDCK staff also conducts weekly in-house Coliform Presence/Absence testing. Tests for total and fecal coliforms are performed in accordance with the methods outlined in the Standard Methods for the Examination of Water and Wastewater (2005). Colony forming units (cfu) per 100 ml are determined for each sample. There were no adverse sample results in 2024.

4.2 Turbidity

Turbidity is measured on the Arrow Creek raw source water and post ultra-filtration water using both in-line and handheld turbidity meters. The Regional District targets a turbidity level post ultrafiltration treatment at or below 0.10 NTU. Turbidity did not exceed this threshold in 2024. Figure 1 outlines raw water turbidity levels, and Figure 2 outlines permeate (treated) water turbidity levels. Comparing these two figures demonstrates the effectiveness of membrane filtration to reduce turbidity in source water.

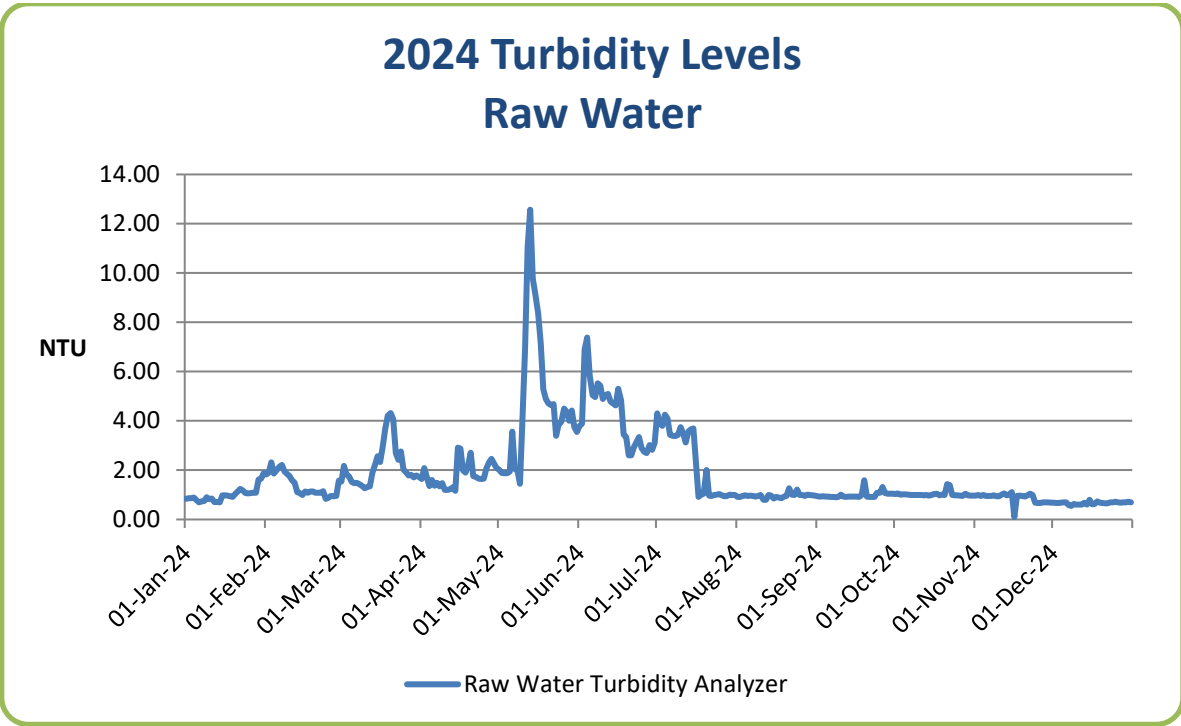


Figure 1 – Raw Water Turbidity Levels for Reporting Period

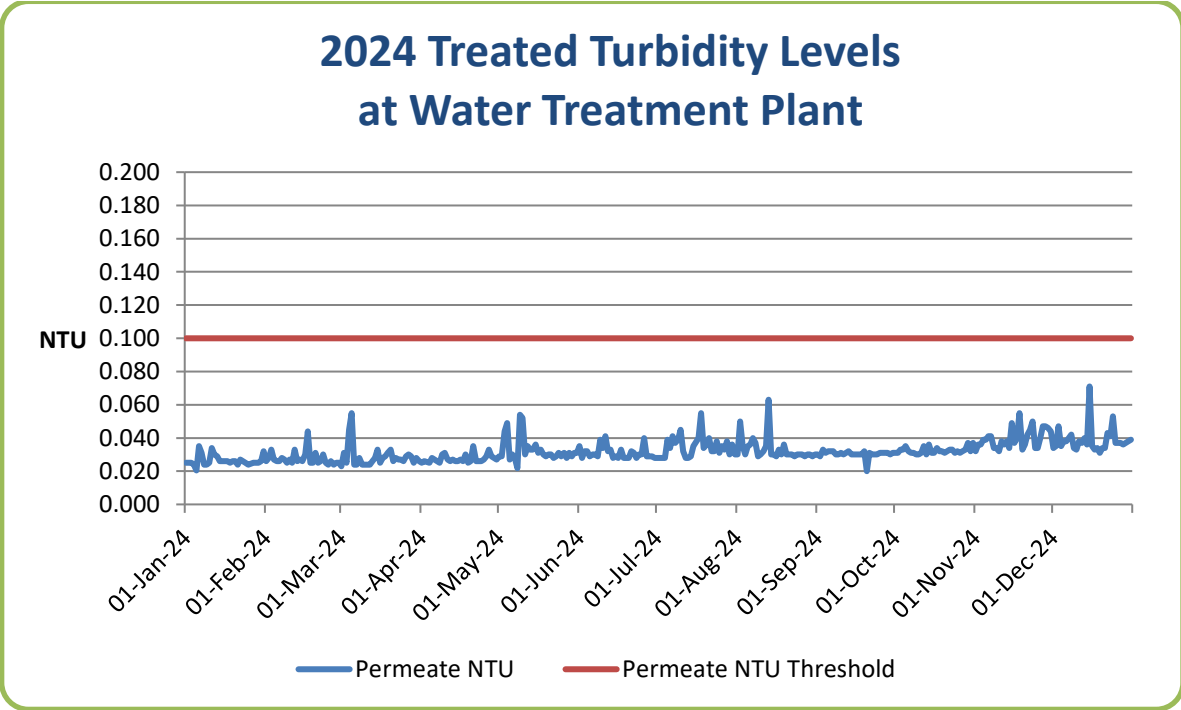


Figure 2 – Permeate (Treated) Water Turbidity Levels for Reporting Period

4.3 Chlorine Residual

Chlorine residual levels are measured post reservoir and within the distribution system throughout the year. The Regional District targets a minimum chlorine residual of 0.70 mg/l leaving the reservoir to maintain 0.2 mg/L in all areas of the distribution system as complete loss of residual would result in a water quality concern. On March 19, 2024 the Chlorine residual analyzer reading was below 0.70 mg/l leaving the treated water storage reservoir. However, the treatment plant analyzer needed calibration and the handheld reading was 0.85 mg/L. Figure 3 shows chlorine residual levels post reservoir.

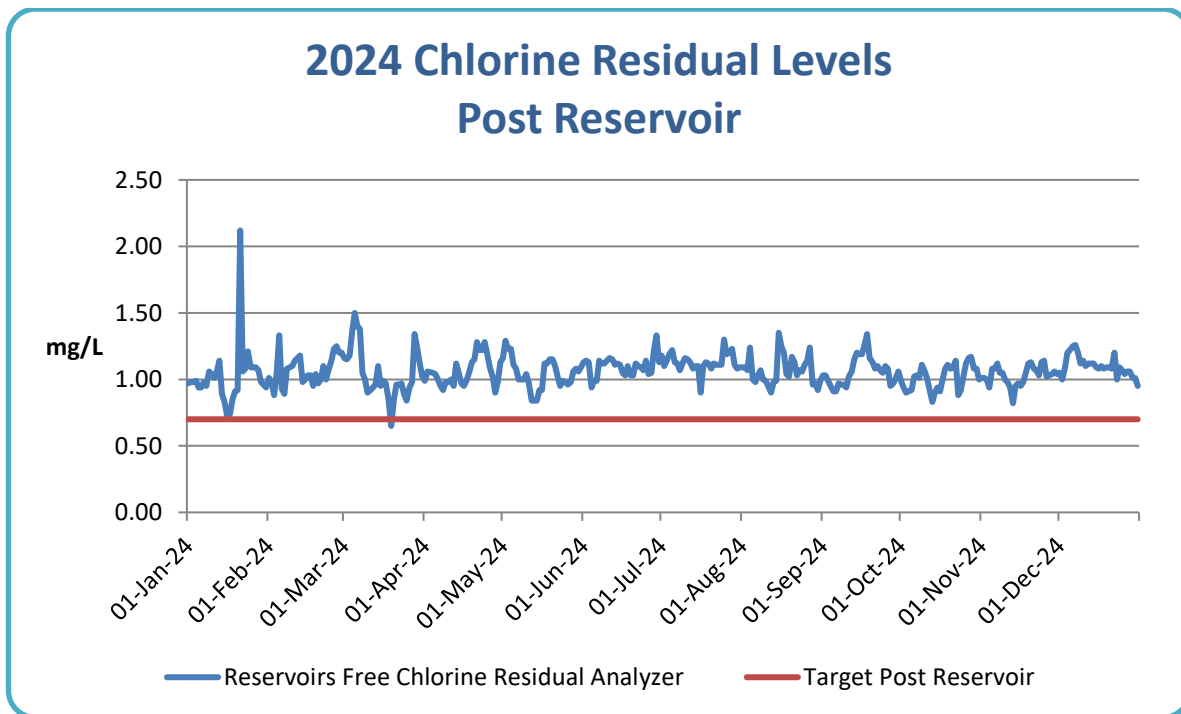


Figure 3 – Free Chlorine Residual Levels for Reporting Period

4.4 Consumption

Flow rates are measured for both the Arrow Creek water treatment plant and the Town of Creston. The consumption rate for the Erickson water system is determined from subtracting the two totals. The total recorded volume of treated water for the Arrow Creek water treatment plant in 2024 was 2,755,900 m³. The total calculated consumption volume for the Erickson water system in 2024 was 1,329,438 m³. Figure 4 shows the volumes per month of both the Arrow Creek water treatment plant and the Erickson water system for the reporting period.

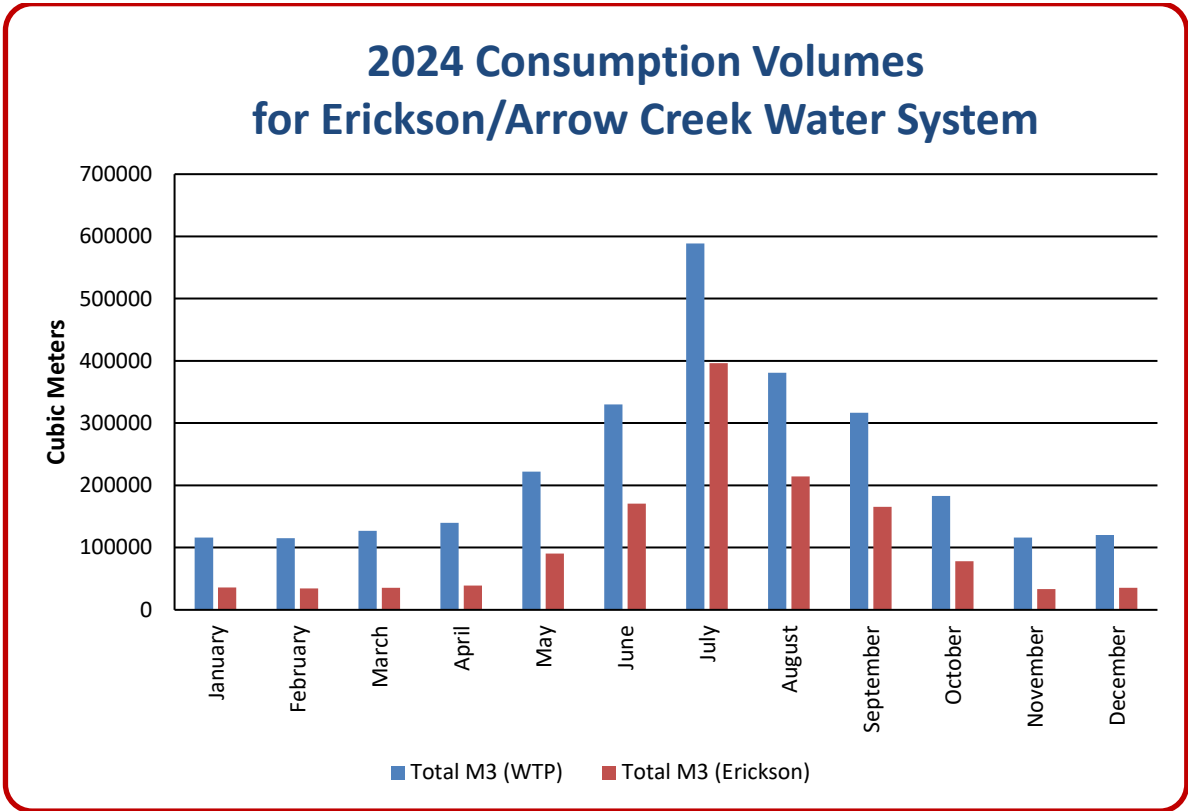


Figure 4 – Treated Water Volumes for Reporting Period

4.5 Chemistry

Comprehensive chemical analysis of water constituents in both the source water (Arrow Creek) and within the distribution system (Erickson) was completed in October 2024 and includes testing for metals, anions, general parameters, volatile organic compounds, and disinfection by-products (trihalomethanes and haloacetic acids). The results in Appendix A show that all tested parameters are below the Maximum Acceptable Concentration (MAC) as detailed in Health Canada’s *Guidelines for Canadian Drinking Water Quality – Summary Table (2024)*.

5. Advisories Issued

The following table describes the Notices and Advisories issued for the reporting period.

Table 1 – Notices and Advisories Issued

Notice/Advisory Type	Dates in Effect	Reason
Boil Water Notice - Localized	April 4 – 16, 2024	Water main repair
Boil Water Notice - Localized	May 15 – June 3, 2024	Service repair
Boil Water Notice - Localized	May 28 – June 3, 2024	Service repair
Boil Water Notice - Localized	July 4 – July 12, 2024	Service repair
Boil Water Notice - Localized	Sept 18 – Oct 1, 2024	Service repair

Boil Water Notice - Localized	Oct 4 – 11, 2024	Service repair
Boil Water Notice - Localized	Oct 21 – 28, 2024	Water main repair
Boil Water Notice - Localized	Oct 31 – Nov 7, 2024	Service repair

*Each Notice/Advisory was issued a Rescind Notice to notify the public once action was completed and water quality sampling results demonstrated good water quality.

6. Capital Projects and Operations & Maintenance

The following capital projects were completed in 2024:

- UV reactor replacements
- Filtration feasibility study
- Creston Valley Alternative Water Supply for Agriculture (engineering study)
- Heating and energy upgrades (design)
- Phase 1 metering - procurement and planning
- Wenger Road gate replaced

The following operations and maintenance items were completed in 2024:

- Replaced broken gate valves with curb stop valves on 10 services
- Finding and marking service valves for phase 1 metering project properties
- Inspection and maintenance of 10" PRV in cabinet on Crawford Hill Rd.
- Replaced a road crossing on Hwy 3 servicing 3 properties
- Repaired 3 water main leaks
- Flushing and valve exercising

7. Water Conservation

Mandatory Stage 1 water conservation measures are in place from June 1st to September 30th every year. In Stage 1 measures, watering lawns, gardens, trees and shrubs is permitted only from 7pm to 10am daily. Watering using drip irrigation, a watering can or a hand-held hose is permitted anytime.

The RDCK implemented Stage 2 Water Conservation Measures in the Erickson water system on July 10th, 2024. These measures remained in place until October 2nd, 2024 when all conservations measures were rescinded. Stage 2 measures permit watering of lawns, gardens, trees and shrubs ONLY between 6:00am-10:00am and 8:00pm-10:00pm. Watering using drip irrigation, a watering can or a hand-held hose is permitted anytime. The RDCK did not implement Stage 3 Water Conservation Measures in the Erickson water system in 2024.

8. Planned Improvements

8.1 Improvements Required by Operating Permit or Environmental Health Officer

Interior Health's Environmental Health Officer (EHO) reviewed the Arrow Creek/Erickson water system in fall of 2024 and provided the following Conditions on Operating Permit under Section 8 of the *BC Drinking Water Act*:

Condition #1: Submit Commissioning Report & Operations Plan for Ultraviolet Disinfection Devices

Status: Completed

Condition #2: Submit Drought Management Plan

Status: In Progress – DRAFT completed

Condition #3: Submit Water System Master Plan & Asset Management Plan

Status: In Progress

Condition #4: Update Operations & Maintenance Plan

Status: In Progress

Condition #5: Update Source Protection Planning Tools

Status: Ongoing

The RDCK is committed to complying with all terms and conditions of the permit by the target dates provided by Interior Health.

8.2 Future Improvements

The Erickson water system asset management plan identifies a backlog of approximately \$19.5 million in distribution system pipe replacement needs. In addition to the required replacement of these linear assets, much of the Erickson system is legacy asbestos concrete watermain that may require removal, including safe handling and disposal protocols unique to this material. Asbestos concrete removal costs are handled separately in the asset management plan. For Erickson, this cost is estimated at an additional \$5.6 million.

The following future improvements are planned for the system:

- Phase 2 meter installations (2025/2026)
- Distribution upgrades - Erickson Rd (2025)
- Water treatment plant heating and energy upgrades (2025)

- Pre-treatment upgrades – (2025/2026)
- Intake erosion control (2025)

To improve treatment plant operations and better manage water being diverted from Arrow Creek, pre-treatment upgrades to minimize settling pond overflow and increase effectiveness of baffles, along with additional screening and pond isolation capabilities for cleaning are being planned over the next few years.

9. Training and Certification

Table 2 – Operator Certification

OPERATOR	ACTIVE EOCP LEVELS
Allan K. Richardson	WD-II, WT-II, WWC-II, MWWT-I, CH
Cody Peck	WT-II, WD-II, CH
Evan Bjarnason	WT-II, WD-II, CH
Kalen Luck	WT-I

10. Emergency Response and Contingency Plan

The Emergency Response and Contingency Plan (ERCP) for the Erickson and Arrow Creek systems is updated annually. The ERCP includes emergency contact information, a communications plan, and detailed procedures for the following types of incidents:

- broken water main;
- source contamination;
- elevated turbidity levels in treated water;
- fire in a building;
- flood conditions;
- loss of source;
- presence of coliforms or E. coli;
- pump failure;
- power failure;
- UV failure; and
- low chlorine residuals.

The *Drinking Water Protection Regulation (2003)*, under Section 13, requires that water suppliers provide an ERCP to address any potential emergencies that may impact the delivery of water and health of those being supplied by the water system. The ERCP must be made accessible to the staff of the water supplier and a copy submitted to the local Environmental Health Officer. The RDCK has fulfilled these requirements for the Erickson Water System.

Appendix A: Comprehensive Chemistry Analysis Results



CERTIFICATE OF ANALYSIS

REPORTED TO	Regional District of Central Kootenay - Erickson 531B 16th Ave. South CRESTON, BC V0B 1G5	WORK ORDER	24J3162
ATTENTION	Allan Richardson	RECEIVED / TEMP REPORTED	2024-10-22 12:30 / 5.1°C 2024-10-31 14:49
PO NUMBER	RDCK- Erickson	COC NUMBER	B136123
PROJECT	Arrow Creek/ Erickson		
PROJECT INFO			

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.

By engaging our services, you are agreeing to CARO Analytical Service's Standard Terms and Conditions outlined here: <https://www.caro.ca/terms-conditions>

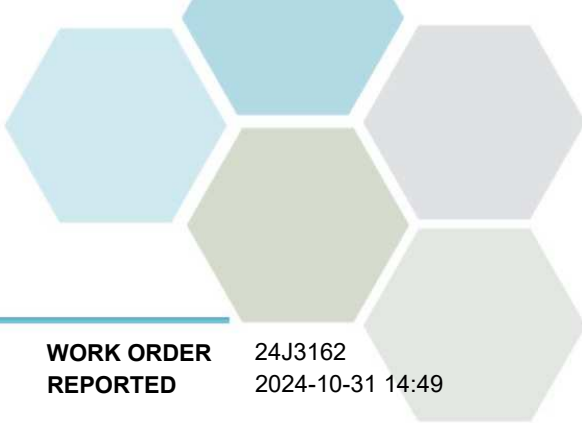
If you have any questions or concerns, please contact me at bwhitehead@caro.ca

Authorized By:

Brent Whitehead
Account Manager

1-888-311-8846 | www.caro.ca

#110 4011 Viking Way Richmond, BC V6V 2K9 | #102 3677 Highway 97N Kelowna, BC V1X 5C3 | 17225 109 Avenue Edmonton, AB T5S 1H7 | #108 4475 Wayburne Drive Burnaby, BC V5G 4X4



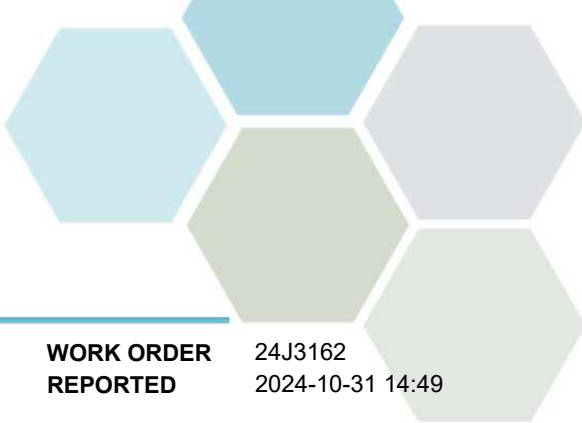
TEST RESULTS

REPORTED TO PROJECT Regional District of Central Kootenay - Erickson
Arrow Creek/ Erickson

WORK ORDER REPORTED 24J3162
2024-10-31 14:49

Analyte	Result	RL	Units	Analyzed	Qualifier
Arrow Creek (24J3162-01) Matrix: Water Sampled: 2024-10-17 09:15					
Anions					
Chloride	0.18	0.10	mg/L	2024-10-25	
Fluoride	< 0.10	0.10	mg/L	2024-10-25	
Nitrate (as N)	< 0.010	0.010	mg/L	2024-10-25	HT1
Nitrite (as N)	< 0.010	0.010	mg/L	2024-10-25	HT1
Sulfate	6.1	1.0	mg/L	2024-10-25	
Calculated Parameters					
Hardness, Total (as CaCO3)	43.4	0.500	mg/L	N/A	
Solids, Total Dissolved	49.0	1.00	mg/L	N/A	
General Parameters					
Alkalinity, Total (as CaCO3)	42.0	1.0	mg/L	2024-10-25	
Alkalinity, Phenolphthalein (as CaCO3)	< 1.0	1.0	mg/L	2024-10-25	
Alkalinity, Bicarbonate (as CaCO3)	42.0	1.0	mg/L	2024-10-25	
Alkalinity, Carbonate (as CaCO3)	< 1.0	1.0	mg/L	2024-10-25	
Alkalinity, Hydroxide (as CaCO3)	< 1.0	1.0	mg/L	2024-10-25	
Conductivity (EC)	92.7	2.0	µS/cm	2024-10-25	
Cyanide, Total	< 0.0020	0.0020	mg/L	2024-10-26	
pH	6.90	0.10	pH units	2024-10-25	HT2
Turbidity	0.15	0.10	NTU	2024-10-25	HT1
Total Metals					
Aluminum, total	0.0062	0.0050	mg/L	2024-10-28	
Antimony, total	< 0.00020	0.00020	mg/L	2024-10-28	
Arsenic, total	< 0.00050	0.00050	mg/L	2024-10-28	
Barium, total	0.0216	0.0050	mg/L	2024-10-28	
Boron, total	< 0.0500	0.0500	mg/L	2024-10-28	
Cadmium, total	< 0.000010	0.000010	mg/L	2024-10-28	
Calcium, total	11.9	0.20	mg/L	2024-10-28	
Chromium, total	< 0.00050	0.00050	mg/L	2024-10-28	
Copper, total	< 0.00040	0.00040	mg/L	2024-10-28	
Iron, total	< 0.010	0.010	mg/L	2024-10-28	
Lead, total	< 0.00020	0.00020	mg/L	2024-10-28	
Magnesium, total	3.33	0.010	mg/L	2024-10-28	
Manganese, total	0.00067	0.00020	mg/L	2024-10-28	
Potassium, total	0.48	0.10	mg/L	2024-10-28	
Selenium, total	< 0.00050	0.00050	mg/L	2024-10-28	
Sodium, total	1.48	0.10	mg/L	2024-10-28	
Strontium, total	0.0352	0.0010	mg/L	2024-10-28	
Uranium, total	0.000115	0.000020	mg/L	2024-10-28	
Zinc, total	< 0.0040	0.0040	mg/L	2024-10-28	

Erickson Distribution (24J3162-02) | Matrix: Water | Sampled: 2024-10-17 08:30



TEST RESULTS

REPORTED TO PROJECT Regional District of Central Kootenay - Erickson
Arrow Creek/ Erickson

WORK ORDER REPORTED 24J3162
2024-10-31 14:49

Analyte	Result	RL	Units	Analyzed	Qualifier
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Erickson Distribution (24J3162-02) | Matrix: Water | Sampled: 2024-10-17 08:30, Continued

Anions

Chloride	1.70	0.10	mg/L	2024-10-25	
Fluoride	< 0.10	0.10	mg/L	2024-10-25	
Nitrate (as N)	< 0.010	0.010	mg/L	2024-10-25	HT1
Nitrite (as N)	< 0.010	0.010	mg/L	2024-10-25	HT1
Sulfate	5.8	1.0	mg/L	2024-10-25	

Calculated Parameters

Total Trihalomethanes	0.0210	0.00400	mg/L	N/A	
Hardness, Total (as CaCO3)	42.7	0.500	mg/L	N/A	
Solids, Total Dissolved	55.4	1.00	mg/L	N/A	

General Parameters

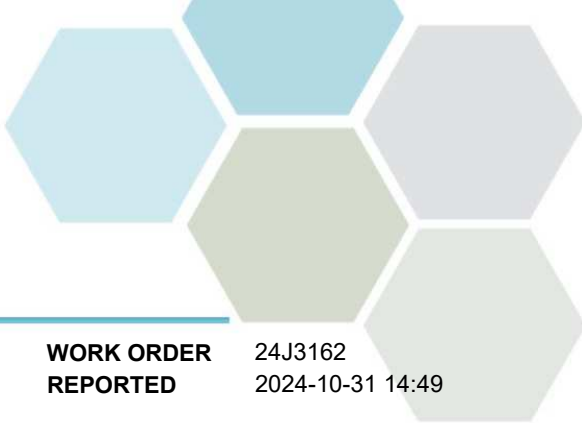
Alkalinity, Total (as CaCO3)	48.5	1.0	mg/L	2024-10-25	
Alkalinity, Phenolphthalein (as CaCO3)	< 1.0	1.0	mg/L	2024-10-25	
Alkalinity, Bicarbonate (as CaCO3)	48.5	1.0	mg/L	2024-10-25	
Alkalinity, Carbonate (as CaCO3)	< 1.0	1.0	mg/L	2024-10-25	
Alkalinity, Hydroxide (as CaCO3)	< 1.0	1.0	mg/L	2024-10-25	
Conductivity (EC)	105	2.0	µS/cm	2024-10-25	
Cyanide, Total	< 0.0020	0.0020	mg/L	2024-10-26	
pH	8.10	0.10	pH units	2024-10-25	HT2
Turbidity	0.12	0.10	NTU	2024-10-25	HT1

Haloacetic Acids

Monochloroacetic Acid	< 0.0020	0.0020	mg/L	2024-10-31	
Monobromoacetic Acid	< 0.0020	0.0020	mg/L	2024-10-31	
Dichloroacetic Acid	0.0093	0.0020	mg/L	2024-10-31	
Trichloroacetic Acid	0.0092	0.0020	mg/L	2024-10-31	
Dibromoacetic Acid	< 0.0020	0.0020	mg/L	2024-10-31	
Total Haloacetic Acids (HAA5)	0.0185	0.00200	mg/L	N/A	
Surrogate: 2-Bromopropionic Acid	108	70-130	%	2024-10-31	

Total Metals

Aluminum, total	< 0.0050	0.0050	mg/L	2024-10-28	
Antimony, total	< 0.00020	0.00020	mg/L	2024-10-28	
Arsenic, total	< 0.00050	0.00050	mg/L	2024-10-28	
Barium, total	0.0214	0.0050	mg/L	2024-10-28	
Boron, total	< 0.0500	0.0500	mg/L	2024-10-28	
Cadmium, total	< 0.000010	0.000010	mg/L	2024-10-28	
Calcium, total	11.8	0.20	mg/L	2024-10-28	
Chromium, total	< 0.00050	0.00050	mg/L	2024-10-28	
Copper, total	0.00370	0.00040	mg/L	2024-10-28	
Iron, total	< 0.010	0.010	mg/L	2024-10-28	
Lead, total	< 0.00020	0.00020	mg/L	2024-10-28	
Magnesium, total	3.22	0.010	mg/L	2024-10-28	



TEST RESULTS

REPORTED TO PROJECT Regional District of Central Kootenay - Erickson
Arrow Creek/ Erickson

WORK ORDER REPORTED 24J3162
2024-10-31 14:49

Analyte	Result	RL	Units	Analyzed	Qualifier
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Erickson Distribution (24J3162-02) | Matrix: Water | Sampled: 2024-10-17 08:30, Continued

Total Metals, Continued

Manganese, total	0.00030	0.00020	mg/L	2024-10-28	
Potassium, total	0.52	0.10	mg/L	2024-10-28	
Selenium, total	< 0.00050	0.00050	mg/L	2024-10-28	
Sodium, total	2.83	0.10	mg/L	2024-10-28	
Strontium, total	0.0348	0.0010	mg/L	2024-10-28	
Uranium, total	0.000104	0.000020	mg/L	2024-10-28	
Zinc, total	< 0.0040	0.0040	mg/L	2024-10-28	

Volatile Organic Compounds (VOC)

Bromodichloromethane	< 0.0010	0.0010	mg/L	2024-10-29	
Bromoform	< 0.0010	0.0010	mg/L	2024-10-29	
Chloroform	0.0210	0.0010	mg/L	2024-10-29	
Dibromochloromethane	< 0.0010	0.0010	mg/L	2024-10-29	
Surrogate: Toluene-d8	111	70-130	%	2024-10-29	
Surrogate: 4-Bromofluorobenzene	77	70-130	%	2024-10-29	

Sample Qualifiers:

- HT1 The sample was prepared and/or analyzed past the recommended holding time.
- HT2 The 15 minute recommended holding time (from sampling to analysis) has been exceeded - field analysis is recommended.