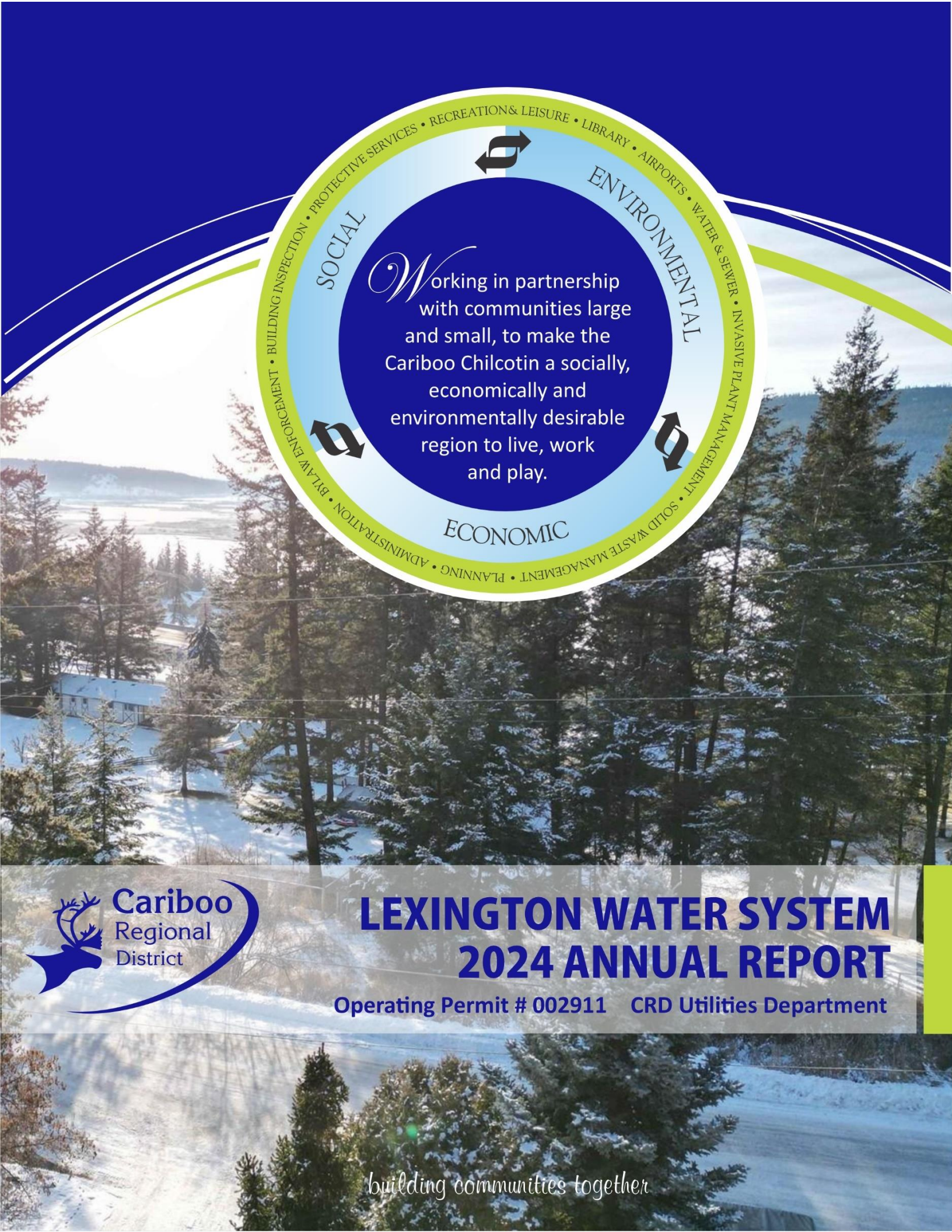

Cariboo Regional District

LEXINGTON WATER SYSTEM 2024 ANNUAL REPORT

Operating Permit # 002911 CRD Utilities Department

building communities together

Cariboo Regional District
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File: 5600-20-06-01

January 14, 2025

Christine Sweezey
Environmental Health Officer
Interior Health
540 Borland Street, 3rd Floor
Williams Lake, BC V2G 2G8

Dear Christine Sweezey:

Re: Transmittal of the 2024 Annual Report for the Lexington Water System

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We are pleased to submit the 2024 Annual Report for the Lexington Water System. This report is prepared to provide a comprehensive summary of the key developments, activities, and achievements of 2024, as well as to outline plans for the water system.

The report has been developed with consideration for public engagement and transparency, ensuring it meets the information needs of Interior Health, the Cariboo Regional District Board of Directors, and particularly the Lexington community, as represented by Electoral Area F Director Maureen LeBourdais.

We trust this report will serve as a valuable resource in understanding the progress and direction of the Lexington Water System.

Sincerely,

Kelly McDonald
Manager of Utilities

KM/cm

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1. Executive Summary

The Cariboo Regional District (CRD) has operated the Lexington Water System in Area F since 2020, serving 29 active connections. Despite limited tax revenue and ongoing reliance on grant funding, CRD has maintained a strong focus on water quality through structured maintenance schedules, including bacteriological testing and chlorine residual management. Seasonal fluctuations and high demand have strained the system, prompting the planned implementation of a water restrictions bylaw to stabilize operations.

Looking ahead, key projects include developing a 2025 system Master Plan to guide long-term asset management and installing system blowoffs to improve water circulation. The CRD remains committed to staff development, with continued Environmental Operator's Certification Program (EOCP) training and diligent efforts to meet operational and regulatory standards.

Water quality challenges persist due to elevated manganese and arsenic concentrations, necessitating continuous monitoring. Cross-connection control and source protection measures are being explored to mitigate contamination risks. Emergency planning has been prioritized, with a new Emergency Response and Contingency Plan (ERCP) under development to enhance preparedness and drought management strategies.

Efforts in asset management, operational improvements, and proactive emergency planning underscore CRD's commitment to delivering safe and reliable water services to Lexington residents.

2. Introduction

The CRD has operated the Lexington Water System for the residents of the area since 2020. Located in Area F, it is one of the CRD's smallest systems with only twenty-nine active service connections. The small tax revenue for this system makes proactive maintenance difficult and it is heavily reliant on grant funding. Lexington benefits from a new pump station which allows for the maintaining of a disinfectant residual in the distribution system. Water greatly fluctuates with the seasons, often beyond the system's capacity. This problem will likely be resolved once the CRD water restrictions bylaw is implemented.

3. Maintenance

CRD Operators follow a structured maintenance and monitoring schedule approved by Interior Health Authority to ensure water quality. Key activities include:

- Collecting 48 bacteriological water samples annually and sending them to an accredited laboratory to confirm potability and detect potential issues.
- Conducting full-spectrum water quality analysis as required.
- Performing weekly inspections and maintenance of system equipment to monitor performance and ensure operational reliability.

Planning is underway for full system main valve exercising, fire hydrant, and pressure reducing valve maintenance in 2025.

3.1. Water Disinfection and Compliance

The CRD maintains a chlorine residual as recommended by industry best practice to safeguard our residents on the Lexington Water System. The residual is kept at no lower than 0.5 mg/L and no greater than 1.0 mg/L with instrumentation and specialized dosing pumps. The superior quality of the water eliminates the risk of chlorine by-products in this system. Regular residual sampling is undertaken by the Operators to confirm dosing accuracy.

4. Projects and Planned Activities

The commissioning of a system Master Plan for Lexington is budgeted for 2025 to assist in asset management and long-term cost analysis. This plan will consider such factors as expected lifespan and criticality of assets to best prioritize spending.

In 2025, system “blowoffs” (yard hydrant style outlets) are planned to be installed at the dead ends of water mains to allow Operators to flush the system. Lexington is a “tree” system rather than a loop system which translates into make mainline dead ends which can reduce water quality.



Figure 1: Typical Blowoff

5. Environmental Operator’s Certification Program (EOCP)

The CRD has been active in 2024, with staff completing numerous training courses and achieving certification levels in the Environmental Operator’s Certification Program (EOCP). The Central region systems have two certified Operators *(table 1).*

The Operators are responsible for operating the Lexington Water System along with Russet Bluff and Lexington water systems. These Operators are also responsible for the sewer systems in Lexington, Pine Valley and Wildwood.

Table 1: Environmental Operator Certification Levels

Operator	***Region***	***Water Distribution***	***Water Treatment***	***Small Water Systems***
Ken Heidema	*Central*	2	1	☑
Charles Howes	*Central*	1	1	
Jourdy Ouellette (backup)	*South*	3	2	
Philip Wilkins (backup)	*North*	1	1	☑
Manager (backup)	*Central*	4	1	

Operators have worked diligently to maintain the level of service our residents expect while safeguarding public health. We anticipate improvements in 2025 through additional staff and continued training.

6. Source to Tap Risks and Cross-Connection Control

The Lexington Water System relies on a single source well located in a developed area at the center of the community, which poses a higher risk of contamination due to nearby human activities. To mitigate these risks, establishing a Source Protection Area will be assessed. Additionally, a cross-connection control program is planned to prevent potential backflow of contaminants into the water system, enhancing overall protection and reliability and meeting permit requirements.

7. Water Sampling

The 2024 sampling schedule consisted of a full chemical analysis as well as twice monthly bacteriological sampling at two locations. In addition, chlorine residuals and turbidity are monitored by the Operators in real time.

* *Sample results attached.*

8. Water Quality

Options are limited for source water well locations for the Lexington Water System. Prior to the well, many residents' water was supplied directly from the lake. Arsenic is a concern with Lexington source water and continual monthly monitoring is required. Arsenic is below the maximum allowable concentration (MAC), but the concentration tests high enough to warrant constant monitoring in case of changes in the source water.

9. Events

The Lexington Water System's small reservoir was cleaned and inspected by the CRD in 2024. This operation initiated a planned boil water advisory to ensure no contamination was introduced into the system. Samples came back satisfactory, and the advisory was lifted as scheduled.

9.1. Asset Management

Throughout 2024, asset management inventory and implementation efforts have been ongoing across all Cariboo Regional District utilities, including the Lexington Water System. This initiative is designed to support more efficient budgeting for system improvements and strengthen preventive maintenance practices. A system Master Plan is scheduled for development in 2025 to assist with long-term budgeting and improve eligibility for grant funding opportunities.

9.2. Water Demand

Demand averaged 526 litres per resident per day in 2024, which is substantially above the national average residential use (329 litres). This statistic is based off a regional average of 2.5 residents per connection. Total water demand was 14,178 cubic meters with a peak use in July (3,582 cubic metres; 1,594 litres per person per day) and lowest use in February (373 cubic metres; 166 litres per person per day). Demand illustrated below (*figure 2*):

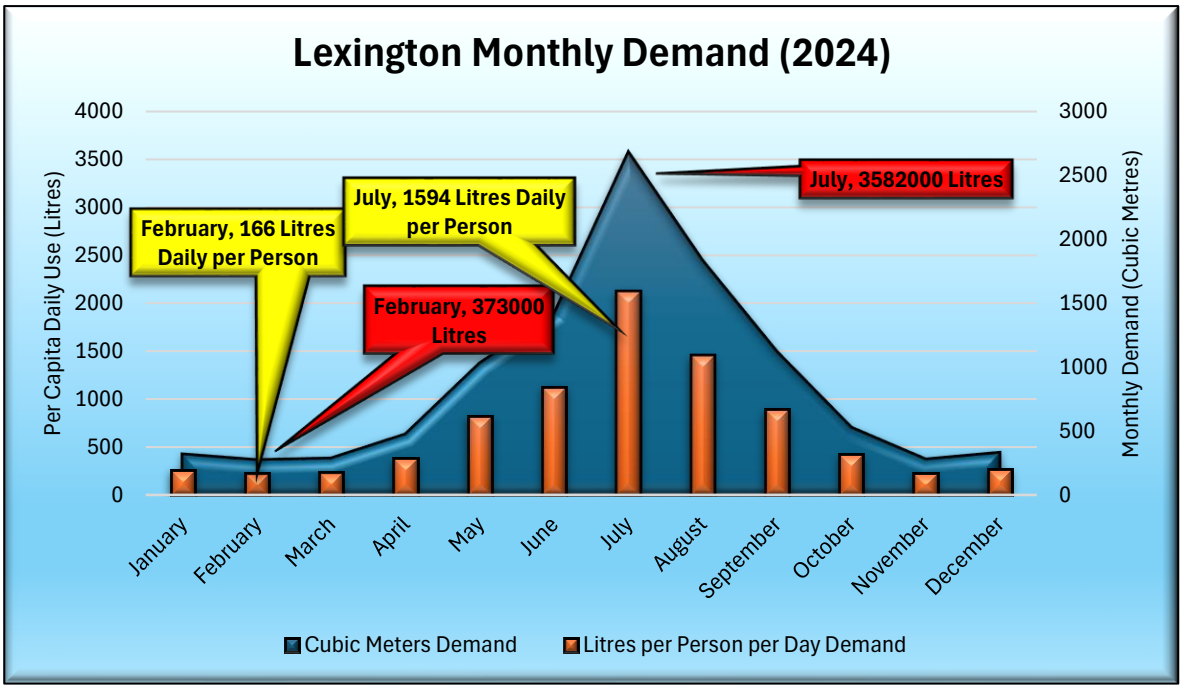

Figure 2: Lexington Monthly Demand

During the summer months, peak demand usage is beyond system capacity on certain days and the reservoir is not being replenished. A water restrictions bylaw is due to be introduced that will (hopefully) alleviate this issue. Responsible water use will allow capital projects, such as a larger reservoir or new wells, to be deferred, ultimately saving the residents tax dollars.

10. Emergency Planning

A new Emergency Response and Contingency Plan (ERCP) for the Lexington Water System is currently being developed to enhance preparedness and ensure quick, coordinated responses to potential emergencies affecting the water supply.

The process began with a risk assessment to identify potential hazards, such as equipment failures, natural disasters, contamination events, and power outages. Stakeholder input, including feedback from Operators, community members, and regulatory bodies, helped shape the plan to address specific vulnerabilities and local conditions.

10.1. Key Elements of the ERCP

The key elements of the ERCP include:

- Clear Response Protocols: Step-by-step actions for various emergency scenarios.
- Roles and Responsibilities: Defined roles for Operators, management, and external agencies.
- Communication Strategies: Procedures for notifying residents, government agencies, and media.
- Resource Allocation: Identification of equipment, backup systems, and personnel required during emergencies.
- Training and Drills: Regular exercises to ensure staff are familiar with the plan and can respond efficiently.

The plan will be reviewed and approved by local health authorities to ensure compliance with provincial regulations. Updating the ERCP ensures that emergency procedures align with the current operational capacity.

In addition, a drought management plan is also currently being developed in line with best practice.

** Plans attached.*

11. Conclusion

In conclusion, the Lexington Water System continues to face operational challenges due to

limited funding, seasonal demand fluctuations, and persistent water quality issues. Despite these obstacles, the Cariboo Regional District remains committed to maintaining service reliability and public health through structured maintenance, staff certification, and ongoing monitoring efforts. Looking forward, key initiatives such as the 2025 system Master Plan, infrastructure improvements, and enhanced emergency response planning will support long-term system sustainability and strengthen the CRD's ability to meet the needs of Lexington residents.

12. References

- *Health Canada (2019, May 21). Guidance on Natural Organic Matter in Drinking Water. Retrieved from https://www.canada.ca/en/health-canada/programs/consultation-organic-matter-drinking-water/document.html#es*
- *Environmental Operators Certification Program (2024). Retrieved from https://eocp.ca/*
- *Sample results, Interior Health. Retrieved from https://services.interiorhealth.ca/publichealthprotection/watersamples.aspx*
- Statistics Canada (2021). *Survey of Drinking Water Plants – The Daily.* https://www150.statcan.gc.ca/n1/daily-quotidien/231114/dq231114d-eng.htm

Thank you to:

- *Cheryl McMullen*
- *Jourdy Ouellette*
- *Colin Brusic*
- *Ken Heidema*
- *Chuck Howes*
- *Phil Wilkins*
- *Tyler Olsen*

for their contribution.

Appendix A: Links

Interior Health:

- *Interior Health Water Advisories*
- *Drinking Water | Environmental & Seasonal Health | IH*

Cariboo Regional District:

- *Water Notices and Advisories - Cariboo Regional District*
- *Sewer and Water Services - Cariboo Regional District*

Notification App (VoyentAlert!):

- *Emergency Notification System - Cariboo Regional District*

Environmental Operators Certification Program (EOCP):

- *EOCP Homepage | EOCP*
- *Backflow Prevention, Cross Connection Control, and the Environmental Operators Certification Program | EOCP*

Appendix B: Sample Results

Facility and Sample Site: **Lexington Water System** **2502 Sutton Road, Williams Lake, BC**	**Test Type:** **Drinking Water – Bacteriological** **Unit of Measure: CFU per 100 ml**	**Value**	**Date Collected**	**Results**
Pumphouse	Sample Parameter: E. coli	<1	03 Jan 2024	Acceptable
	Sample Parameter: Total Coliform	<1	03 Jan 2024	Acceptable
Sample Station	Sample Parameter: E. coli	<1	03 Jan 2024	Acceptable
	Sample Parameter: Total Coliform	<1	03 Jan 2024	Acceptable
Pumphouse	Sample Parameter: E. coli	<1	09 Jan 2024	Acceptable
	Sample Parameter: Total Coliform	<1	09 Jan 2024	Acceptable
Sample Station	Sample Parameter: E. coli	<1	09 Jan 2024	Acceptable
	Sample Parameter: Total Coliform	<1	09 Jan 2024	Acceptable
Pumphouse	Sample Parameter: E. coli	<1	05 Feb 2024	Acceptable
	Sample Parameter: Total Coliform	<1	05 Feb 2024	Acceptable
Sample Station	Sample Parameter: E. coli	<1	05 Feb 2024	Acceptable
	Sample Parameter: Total Coliform	<1	05 Feb 2024	Acceptable
Pumphouse	Sample Parameter: E. coli	<1	12 Feb 2024	Acceptable
	Sample Parameter: Total Coliform	<1	12 Feb 2024	Acceptable
Sample Station	Sample Parameter: E. coli	<1	12 Feb 2024	Acceptable
	Sample Parameter: Total Coliform	<1	12 Feb 2024	Acceptable
Pumphouse	Sample Parameter: E. coli	<1	04 Mar 2024	Acceptable
	Sample Parameter: Total Coliform	<1	04 Mar 2024	Acceptable
Sample Station	Sample Parameter: E. coli	<1	04 Mar 2024	Acceptable
	Sample Parameter: Total Coliform	<1	04 Mar 2024	Acceptable
Pumphouse	Sample Parameter: E. coli	<1	11 Mar 2024	Acceptable
	Sample Parameter: Total Coliform	<1	11 Mar 2024	Acceptable
Sample Station	Sample Parameter: E. coli	<1	11 Mar 2024	Acceptable
	Sample Parameter: Total Coliform	<1	11 Mar 2024	Acceptable
Sample Station	Sample Parameter: E. coli	<1	03 Apr 2024	Acceptable
	Sample Parameter: Total Coliform	<1	03 Apr 2024	Acceptable
Pumphouse	Sample Parameter: E. coli	<1	09 Apr 2024	Acceptable
	Sample Parameter: Total Coliform	<1	09 Apr 2024	Acceptable
Sample Station	Sample Parameter: E. coli	<1	09 Apr 2024	Acceptable
	Sample Parameter: Total Coliform	<1	09 Apr 2024	Acceptable
Pumphouse	Sample Parameter: E. coli	<1	15 Apr 2024	Acceptable
	Sample Parameter: Total Coliform	<1	15 Apr 2024	Acceptable
Sample Station	Sample Parameter: E. coli	<1	08 May 2024	Acceptable
	Sample Parameter: Total Coliform	<1	08 May 2024	Acceptable
Pumphouse	Sample Parameter: E. coli	<1	08 May 2024	Acceptable
	Sample Parameter: Total Coliform	<1	08 May 2024	Acceptable
Sample Station	Sample Parameter: E. coli	<1	15 May 2024	Acceptable
	Sample Parameter: Total Coliform	<1	15 May 2024	Acceptable
Pumphouse	Sample Parameter: E. coli	<1	15 May 2024	Acceptable
	Sample Parameter: Total Coliform	<1	15 May 2024	Acceptable
Sample Station	Sample Parameter: E. coli	<1	03 Jun 2024	Acceptable
	Sample Parameter: Total Coliform	<1	03 Jun 2024	Acceptable
Pumphouse	Sample Parameter: E. coli	<1	03 Jun 2024	Acceptable
	Sample Parameter: Total Coliform	<1	03 Jun 2024	Acceptable
Sample Station	Sample Parameter: E. coli	<1	10 Jun 2024	Acceptable
	Sample Parameter: Total Coliform	<1	10 Jun 2024	Acceptable
Pumphouse	Sample Parameter: E. coli	<1	10 Jun 2024	Acceptable
	Sample Parameter: Total Coliform	<1	10 Jun 2024	Acceptable
Sample Station	Sample Parameter: E. coli	<1	08 Jul 2024	Acceptable
	Sample Parameter: Total Coliform	<1	08 Jul 2024	Acceptable
Pumphouse	Sample Parameter: E. coli	<1	08 Jul 2024	Acceptable
	Sample Parameter: Total Coliform	<1	08 Jul 2024	Acceptable
Sample Station	Sample Parameter: E. coli	<1	15 Jul 2024	Acceptable
	Sample Parameter: Total Coliform	<1	15 Jul 2024	Acceptable
Pumphouse	Sample Parameter: E. coli	<1	15 Jul 2024	Acceptable
	Sample Parameter: Total Coliform	<1	15 Jul 2024	Acceptable
Sample Station	Sample Parameter: E. coli	<1	12 Aug 2024	Acceptable
	Sample Parameter: Total Coliform	<1	12 Aug 2024	Acceptable
Pumphouse	Sample Parameter: E. coli	<1	21 Aug 2024	Acceptable
	Sample Parameter: Total Coliform	<1	21 Aug 2024	Acceptable
Sample Station	Sample Parameter: E. coli	<1	10 Sep 2024	Acceptable
	Sample Parameter: Total Coliform	<1	10 Sep 2024	Acceptable
Pumphouse	Sample Parameter: E. coli	<1	10 Sep 2024	Acceptable
	Sample Parameter: Total Coliform	<1	10 Sep 2024	Acceptable

Facility and Sample Site: **Lexington Water System** **2502 Sutton Road, Williams Lake, BC**	**Test Type:** **Drinking Water – Bacteriological** **Unit of Measure: CFU per 100 ml**	**Value**	**Date Collected**	**Results**
Sample Station	Sample Parameter: E. coli	<1	17 Sep 2024	Acceptable
	Sample Parameter: Total Coliform	<1	17 Sep 2024	Acceptable
Pumphouse	Sample Parameter: E. coli	<1	17 Sep 2024	Acceptable
	Sample Parameter: Total Coliform	<1	17 Sep 2024	Acceptable
Sample Station	Sample Parameter: E. coli	<1	01 Oct 2024	Acceptable
	Sample Parameter: Total Coliform	<1	01 Oct 2024	Acceptable
Pumphouse	Sample Parameter: E. coli	<1	01 Oct 2024	Acceptable
	Sample Parameter: Total Coliform	<1	01 Oct 2024	Acceptable
Sample Station	Sample Parameter: E. coli	<1	02 Oct 2024	Acceptable
	Sample Parameter: Total Coliform	<1	02 Oct 2024	Acceptable
Pumphouse	Sample Parameter: E. coli	<1	02 Oct 2024	Acceptable
	Sample Parameter: Total Coliform	<1	02 Oct 2024	Acceptable
Sample Station	Sample Parameter: E. coli	<1	15 Oct 2024	Acceptable
	Sample Parameter: Total Coliform	<1	15 Oct 2024	Acceptable
Pumphouse	Sample Parameter: E. coli	<1	15 Oct 2024	Acceptable
	Sample Parameter: Total Coliform	<1	15 Oct 2024	Acceptable
Sample Station	Sample Parameter: E. coli	<1	04 Nov 2024	Acceptable
	Sample Parameter: Total Coliform	<1	04 Nov 2024	Acceptable
Pumphouse	Sample Parameter: E. coli	<1	04 Nov 2024	Acceptable
	Sample Parameter: Total Coliform	<1	04 Nov 2024	Acceptable
Sample Station	Sample Parameter: E. coli	<1	12 Nov 2024	Acceptable
	Sample Parameter: Total Coliform	<1	12 Nov 2024	Acceptable
Pumphouse	Sample Parameter: E. coli	Inconclusive	12 Nov 2024	Unacceptable
	Sample Parameter: Total Coliform	Overgrown	12 Nov 2024	Unacceptable
Sample Station	Sample Parameter: E. coli	<1	18 Nov 2024	Acceptable
	Sample Parameter: Total Coliform	<1	18 Nov 2024	Acceptable
Pumphouse	Sample Parameter: E. coli	<1	18 Nov 2024	Acceptable
	Sample Parameter: Total Coliform	<1	18 Nov 2024	Acceptable
Sample Station	Sample Parameter: E. coli	<1	02 Dec 2024	Acceptable
	Sample Parameter: Total Coliform	<1	02 Dec 2024	Acceptable
Pumphouse	Sample Parameter: E. coli	<1	02 Dec 2024	Acceptable
	Sample Parameter: Total Coliform	<1	02 Dec 2024	Acceptable
Sample Station	Sample Parameter: E. coli	<1	09 Dec 2024	Acceptable
	Sample Parameter: Total Coliform	<1	09 Dec 2024	Acceptable
Pumphouse	Sample Parameter: E. coli	<1	09 Dec 2024	Acceptable
	Sample Parameter: Total Coliform	<1	09 Dec 2024	Acceptable

Page	:	3 of 3
Work Order	:	KS2400136
Client	:	Cariboo Regional District
Project	:	Drinking Water

Analytical Results Evaluation

Matrix: **Water**

Analyte	CAS Number	Method/Lab	Unit	Client sample ID	Lexington Pump House	----	----	----	----	----	----
				Sampling date/time	15-Jan-2024 13:30	----	----	----	----	----	----
				Sub-Matrix	Water	----	----	----	----	----	----
				KS2400136-001	--------	--------	--------	--------	--------	--------	--------
Total Metals											
Arsenic, total	7440-38-2	E420/VA	mg/L	0.00872	----	----	----	----	----	----	----

Please refer to the General Comments section for an explanation of any result qualifiers detected.

Please refer to the Accreditation section for an explanation of analyte accreditations.

Summary of Guideline Limits

Analyte	CAS Number	Unit	CDWG MAC						
Total Metals									
Arsenic, total	7440-38-2	mg/L	**0.01 mg/L**						

Please refer to the General Comments section for an explanation of any qualifiers detected.

Key:

CDWG	Canada Guidelines for Canadian Drinking Water Quality (JAN, 2023)
MAC	Maximum Acceptable Concentrations

Page	:	3 of 3
Work Order	:	KS2400419
Client	:	Cariboo Regional District
Project	:	Drinking Water

Analytical Results Evaluation

Matrix: **Water**

Analyte	CAS Number	Method/Lab	Unit	Client sample ID: Lexington Pump House	----	----	----	----	----	----
				Sampling date/time: 07-Feb-2024 09:00	----	----	----	----	----	----
				Sub-Matrix: Water	----	----	----	----	----	----
				KS2400419-001	--------	--------	--------	--------	--------	--------
Total Metals										
Arsenic, total	7440-38-2	E420/VA	mg/L	0.00868	----	----	----	----	----	----
Manganese, total	7439-96-5	E420/VA	mg/L	0.0960	----	----	----	----	----	----

Please refer to the General Comments section for an explanation of any result qualifiers detected.

Please refer to the Accreditation section for an explanation of analyte accreditations.

Key:

Page	:	4 of 7
Work Order	:	KS2400865
Client	:	Cariboo Regional District
Project	:	Drinking Water

Analytical Results Evaluation

Matrix: **Water**

Analyte	CAS Number	Method/Lab	Unit	Client sample ID	Alexis Creek	Lexington	Russet Bluff	----	----	----	----
				Sampling date/time	12-Mar-2024 02:30	12-Mar-2024 02:30	12-Mar-2024 02:30	----	----	----	----
				Sub-Matrix	Water	Water	Water	----	----	----	----
					KS2400865-001	KS2400865-002	KS2400865-003	--------	--------	--------	--------
Physical Tests											
Alkalinity, total (as CaCO3)	----	E290/VA	mg/L		277	366	604	----	----	----	----
Colour, true	----	E329/VA	CU		<5.0	<5.0	<5.0	----	----	----	----
Conductivity	----	E100/VA	µS/cm		581	1410	1200	----	----	----	----
pH	----	E108/VA	pH units		8.39	8.37	8.45	----	----	----	----
Solids, total dissolved [TDS]	----	E162/VA	mg/L		347	906	604	----	----	----	----
Turbidity	----	E121/VA	NTU		<0.10	0.65	<0.10	----	----	----	----
Hardness (as CaCO3), from total Ca/Mg	----	EC100A/VA	mg/L		191	528	708	----	----	----	----
Anions and Nutrients											
Chloride	16887-00-6	E235.Cl/VA	mg/L		5.74	57.3	39.7	----	----	----	----
Fluoride	16984-48-8	E235.F/VA	mg/L		0.157	0.112	<0.100 DLDS	----	----	----	----
Nitrate (as N)	14797-55-8	E235.NO3-L/VA	mg/L		0.382	<0.0250 DLDS	0.990	----	----	----	----
Nitrite (as N)	14797-65-0	E235.NO2-L/VA	mg/L		<0.0010	<0.0050 DLDS	<0.0050 DLDS	----	----	----	----
Sulfate (as SO4)	14808-79-8	E235.SO4/VA	mg/L		31.9	339	63.0	----	----	----	----
Total Metals											
Aluminum, total	7429-90-5	E420/VA	mg/L		----	<0.0030	----	----	----	----	----
Aluminum, total	7429-90-5	E420/VA	mg/L		<0.0100	----	<0.0100	----	----	----	----
Antimony, total	7440-36-0	E420/VA	mg/L		----	<0.00010	----	----	----	----	----
Antimony, total	7440-36-0	E420/VA	mg/L		<0.00050	----	<0.00050	----	----	----	----
Arsenic, total	7440-38-2	E420/VA	mg/L		0.00310	0.00887	0.00253	----	----	----	----
Barium, total	7440-39-3	E420/VA	mg/L		----	0.00891	----	----	----	----	----
Barium, total	7440-39-3	E420/VA	mg/L		<0.0200	----	0.0225	----	----	----	----
Boron, total	7440-42-8	E420/VA	mg/L		----	0.123	----	----	----	----	----
Boron, total	7440-42-8	E420/VA	mg/L		<0.100	----	0.212	----	----	----	----
Cadmium, total	7440-43-9	E420/VA	mg/L		----	<0.0000150 DLM	----	----	----	----	----
Cadmium, total	7440-43-9	E420/VA	mg/L		<0.000200	----	<0.000200	----	----	----	----
Calcium, total	7440-70-2	E420/VA	mg/L		----	50.0	----	----	----	----	----
Calcium, total	7440-70-2	E420/VA	mg/L		20.6	----	10.0	----	----	----	----

Page	:	5 of 7
Work Order	:	KS2400865
Client	:	Cariboo Regional District
Project	:	Drinking Water

Analytical Results Evaluation

Matrix: **Water**

Analyte	CAS Number	Method/Lab	Unit	Client sample ID: Alexis Creek	Lexington	Russet Bluff	----	----	----	----
				Sampling date/time: 12-Mar-2024 02:30	12-Mar-2024 02:30	12-Mar-2024 02:30	----	----	----	----
				Sub-Matrix: Water	Water	Water	----	----	----	----
				KS2400865-001	KS2400865-002	KS2400865-003	--------	--------	--------	--------
Total Metals										
Chromium, total	7440-47-3	E420/VA	mg/L	----	<0.00050	----	----	----	----	----
Chromium, total	7440-47-3	E420/VA	mg/L	0.00829	----	0.0116	----	----	----	----
Copper, total	7440-50-8	E420/VA	mg/L	----	0.00051	----	----	----	----	----
Copper, total	7440-50-8	E420/VA	mg/L	0.00148	----	0.00433	----	----	----	----
Iron, total	7439-89-6	E420/VA	mg/L	----	0.167	----	----	----	----	----
Iron, total	7439-89-6	E420/VA	mg/L	<0.030	----	<0.030	----	----	----	----
Lead, total	7439-92-1	E420/VA	mg/L	----	<0.000050	----	----	----	----	----
Lead, total	7439-92-1	E420/VA	mg/L	<0.000500	----	<0.000500	----	----	----	----
Magnesium, total	7439-95-4	E420/VA	mg/L	----	98.0	----	----	----	----	----
Magnesium, total	7439-95-4	E420/VA	mg/L	33.9	----	166	----	----	----	----
Manganese, total	7439-96-5	E420/VA	mg/L	----	0.102	----	----	----	----	----
Manganese, total	7439-96-5	E420/VA	mg/L	<0.00200	----	<0.00200	----	----	----	----
Mercury, total	7439-97-6	E508/VA	mg/L	<0.0000050	<0.0000050	<0.0000050	----	----	----	----
Potassium, total	7440-09-7	E420/VA	mg/L	----	6.06	----	----	----	----	----
Potassium, total	7440-09-7	E420/VA	mg/L	6.03	----	7.38	----	----	----	----
Selenium, total	7782-49-2	E420/VA	mg/L	----	<0.000050	----	----	----	----	----
Selenium, total	7782-49-2	E420/VA	mg/L	0.00537	----	0.00247	----	----	----	----
Sodium, total	7440-23-5	E420/VA	mg/L	----	110	----	----	----	----	----
Sodium, total	7440-23-5	E420/VA	mg/L	62.6	----	32.3	----	----	----	----
Uranium, total	7440-61-1	E420/VA	mg/L	----	0.000987	----	----	----	----	----
Uranium, total	7440-61-1	E420/VA	mg/L	0.00574	----	<0.000100	----	----	----	----
Zinc, total	7440-66-6	E420/VA	mg/L	----	<0.0030	----	----	----	----	----
Zinc, total	7440-66-6	E420/VA	mg/L	<0.0500	----	<0.0500	----	----	----	----

Please refer to the General Comments section for an explanation of any result qualifiers detected.

Please refer to the Accreditation section for an explanation of analyte accreditations.

Page	:	6 of 7
Work Order	:	KS2400865
Client	:	Cariboo Regional District
Project	:	Drinking Water

Summary of Guideline Limits

Analyte	CAS Number	Unit	BCDWQG AO	BCDWQG MAC	BCDWQG OG
Physical Tests					
Alkalinity, total (as CaCO3)	----	mg/L	--	--	--
Colour, true	----	CU	15 CU	--	--
Conductivity	----	µS/cm	--	--	--
Hardness (as CaCO3), from total Ca/Mg	----	mg/L	--	--	--
pH	----	pH units	--	--	7 - 10.5 pH units
Solids, total dissolved [TDS]	----	mg/L	500 mg/L	--	--
Turbidity	----	NTU	--	1 NTU	--
Anions and Nutrients					
Chloride	16887-00-6	mg/L	250 mg/L	--	--
Fluoride	16984-48-8	mg/L	--	1.5 mg/L	--
Nitrate (as N)	14797-55-8	mg/L	--	10 mg/L	--
Nitrite (as N)	14797-65-0	mg/L	--	1 mg/L	--
Sulfate (as SO4)	14808-79-8	mg/L	500 mg/L	--	--
Total Metals					
Aluminum, total	7429-90-5	mg/L	--	2.9 mg/L	--
Antimony, total	7440-36-0	mg/L	--	0.006 mg/L	--
Arsenic, total	7440-38-2	mg/L	--	0.01 mg/L	--
Barium, total	7440-39-3	mg/L	--	2 mg/L	--
Boron, total	7440-42-8	mg/L	--	5 mg/L	--
Cadmium, total	7440-43-9	mg/L	--	0.007 mg/L	--
Calcium, total	7440-70-2	mg/L	--	--	--
Chromium, total	7440-47-3	mg/L	--	0.05 mg/L	--
Copper, total	7440-50-8	mg/L	1 mg/L	2 mg/L	--
Iron, total	7439-89-6	mg/L	0.3 mg/L	--	--
Lead, total	7439-92-1	mg/L	--	0.005 mg/L	--
Magnesium, total	7439-95-4	mg/L	--	--	--
Manganese, total	7439-96-5	mg/L	0.02 mg/L	0.12 mg/L	--
Mercury, total	7439-97-6	mg/L	--	0.001 mg/L	--
Potassium, total	7440-09-7	mg/L	--	--	--
Selenium, total	7782-49-2	mg/L	--	0.05 mg/L	--
Sodium, total	7440-23-5	mg/L	200 mg/L	--	--
Uranium, total	7440-61-1	mg/L	--	0.02 mg/L	--
Zinc, total	7440-66-6	mg/L	5 mg/L	--	--

Please refer to the General Comments section for an explanation of any qualifiers detected.

Page	:	7 of 7
Work Order	:	KS2400865
Client	:	Cariboo Regional District
Project	:	Drinking Water

Key:

BCDWQG		British Columbia Drinking Water Quality Guidelines (JAN, 2023)
	AO	Aesthetic Objective/Other Value
	MAC	Maximium Acceptable Concentrations
	OG	Operational Guidance

Page	:	3 of 3
Work Order	:	KS2401369
Client	:	Cariboo Regional District
Project	:	Drinking Water

Analytical Results Evaluation

Matrix: **Water**

Analyte	CAS Number	Method/Lab	Unit	Client sample ID	Lexington Pump House	----	----	----	----	----	----
				Sampling date/time	17-Apr-2024 13:50	----	----	----	----	----	----
				Sub-Matrix	Water	----	----	----	----	----	----
				KS2401369-001	--------	--------	--------	--------	--------	--------	
Total Metals											
Arsenic, total	7440-38-2	E420/VA	mg/L	0.00924	----	----	----	----	----	----	

Please refer to the General Comments section for an explanation of any result qualifiers detected.

Please refer to the Accreditation section for an explanation of analyte accreditations.

Summary of Guideline Limits

Analyte	CAS Number	Unit	BCDWQG MAC						
Total Metals									
Arsenic, total	7440-38-2	mg/L	**0.01 mg/L**						

Please refer to the General Comments section for an explanation of any qualifiers detected.

Key:

BCDWQG	British Columbia Drinking Water Quality Guidelines (JAN, 2023)
MAC	Maximium Acceptable Concentrations

Page	:	3 of 3
Work Order	:	KS2401919
Client	:	Cariboo Regional District
Project	:	Drinking Water

Analytical Results Evaluation

Matrix: **Water**

Analyte	CAS Number	Method/Lab	Unit	Client sample ID: Lexington (Pump House)	Russet Bluff Lower Well	----	----	----	----	----
				Sampling date/time: 27-May-2024 10:55	27-May-2024 11:20	----	----	----	----	----
				Sub-Matrix: Water	Water	----	----	----	----	----
				KS2401919-001	KS2401919-002	--------	--------	--------	--------	--------
Total Metals										
Arsenic, total	7440-38-2	E420/VA	mg/L	0.00942	----	----	----	----	----	----
Manganese, total	7439-96-5	E420/VA	mg/L	----	0.304	----	----	----	----	----

Please refer to the General Comments section for an explanation of any result qualifiers detected.

Please refer to the Accreditation section for an explanation of analyte accreditations.

Key:

Page	:	3 of 3
Work Order	:	KS2402196
Client	:	Cariboo Regional District
Project	:	----

Analytical Results Evaluation

Matrix: **Water**

Analyte	CAS Number	Method/Lab	Unit	Client sample ID	Lexington (Pump House)	Russet Bluff (Lower Well)	----	----	----	----	----
				Sampling date/time	11-Jun-2024 09:18	11-Jun-2024 13:20	----	----	----	----	----
				Sub-Matrix	Water	Water	----	----	----	----	----
					KS2402196-001	KS2402196-002	--------	--------	--------	--------	--------
Anions and Nutrients											
Nitrate (as N)	14797-55-8	E235.NO3-L/VA	mg/L		<0.0250 DLDS	----	----	----	----	----	----
Total Metals											
Arsenic, total	7440-38-2	E420/VA	mg/L		0.00951	----	----	----	----	----	----
Manganese, total	7439-96-5	E420/VA	mg/L		----	0.294	----	----	----	----	----

Please refer to the General Comments section for an explanation of any result qualifiers detected.

Please refer to the Accreditation section for an explanation of analyte accreditations.

Summary of Guideline Limits

Analyte	CAS Number	Unit	BCDWQG AO	BCDWQG MAC					
Anions and Nutrients									
Nitrate (as N)	14797-55-8	mg/L		**10 mg/L**					
Total Metals									
Arsenic, total	7440-38-2	mg/L		**0.01 mg/L**					
Manganese, total	7439-96-5	mg/L	**0.02 mg/L**	**0.12 mg/L**					

Please refer to the General Comments section for an explanation of any qualifiers detected.

Key:

BCDWQG	British Columbia Drinking Water Quality Guidelines (JAN, 2023)
AO	Aesthetic Objective/Other Value
MAC	Maximium Acceptable Concentrations

Page	:	3 of 8
Work Order	:	KS2402662
Client	:	Cariboo Regional District
Project	:	Drinking Water - Full Chemical Russet Bluff Lower Well

Analytical Results

				Client sample ID	Lexington Pumphouse					
Sub-Matrix: **Water** (Matrix: **Water**)				Sampling date/time	09-Jul-2024 09:58					
Analyte	*Method/Lab*	*LOR*	*Unit*	KS2402662-001	**BCDWQG MAC**	--	--	--	--	--
Total Metals										
Arsenic, total	E420/VA	0.00010	mg/L	0.00880	0.01 mg/L	--	--	--	--	--

Please refer to the General Comments section for an explanation of any result qualifiers detected.

Please refer to the Accreditation section for an explanation of analyte accreditations.

No Breaches Found

Key:

BCDWQG	British Columbia Drinking Water Quality Guidelines (JAN, 2023)
MAC	Maximium Acceptable Concentrations

Page : 4 of 6
Work Order : KS2402923
Client : Cariboo Regional District
Project : ----

Analytical Results

Sub-Matrix: Water (Matrix: Water)					Client sample ID	Lexington Pump House	----	----	----	----
					Client sampling date / time	24-Jul-2024 11:34	----	----	----	----
Analyte	CAS Number	Method/Lab	LOR	Unit		KS2402923-001	--------	--------	--------	--------
						Result	----	----	----	----
Physical Tests										
Absorbance, UV (@ 254nm), unfiltered	----	E405/VA	0.0050	AU/cm		0.0200	----	----	----	----
Alkalinity, bicarbonate (as CaCO3)	----	E290/VA	1.0	mg/L		334	----	----	----	----
Alkalinity, carbonate (as CaCO3)	----	E290/VA	1.0	mg/L		30.5	----	----	----	----
Alkalinity, hydroxide (as CaCO3)	----	E290/VA	1.0	mg/L		<1.0	----	----	----	----
Alkalinity, phenolphthalein (as CaCO3)	----	E290/VA	1.0	mg/L		15.2	----	----	----	----
Alkalinity, total (as CaCO3)	----	E290/VA	1.0	mg/L		365	----	----	----	----
Colour, true	----	E329/VA	5.0	CU		<5.0	----	----	----	----
Conductivity	----	E100/VA	2.0	µS/cm		1440	----	----	----	----
Hardness (as CaCO3), from total Ca/Mg	----	EC100A/VA	0.60	mg/L		553	----	----	----	----
Langelier index (@ 15°C)	----	EC105A/VA	0.010	-		1.16	----	----	----	----
Langelier index (@ 20°C)	----	EC105A/VA	0.010	-		1.24	----	----	----	----
Langelier index (@ 25°C)	----	EC105A/VA	0.010	-		1.30	----	----	----	----
Langelier index (@ 4°C)	----	EC105A/VA	0.010	-		0.996	----	----	----	----
Langelier index (@ 60°C)	----	EC105A/VA	0.010	-		1.73	----	----	----	----
Langelier index (@ 77°C)	----	EC105A/VA	0.010	-		1.92	----	----	----	----
pH	----	E108/VA	0.10	pH units		8.53	----	----	----	----
Solids, total dissolved [TDS]	----	E162/VA	10	mg/L		901	----	----	----	----
Turbidity	----	E121/VA	0.10	NTU		<0.10	----	----	----	----
Transmittance, UV (@ 254nm), unfiltered	----	E405/VA	1.0	% T/cm		95.5	----	----	----	----
Anions and Nutrients										
Ammonia, total (as N)	7664-41-7	E298/VA	0.0050	mg/L		0.180	----	----	----	----
Bromide	24959-67-9	E235.Br-L/VA	0.050	mg/L		<0.250 DLDS	----	----	----	----
Chloride	16887-00-6	E235.Cl/VA	0.50	mg/L		58.8	----	----	----	----
Fluoride	16984-48-8	E235.F/VA	0.020	mg/L		0.148	----	----	----	----
Kjeldahl nitrogen, total [TKN]	----	E318/VA	0.050	mg/L		0.232	----	----	----	----
Nitrate (as N)	14797-55-8	E235.NO3-L/VA	0.0050	mg/L		<0.0250 DLDS	----	----	----	----
Nitrite (as N)	14797-65-0	E235.NO2-L/VA	0.0010	mg/L		<0.0050 DLDS	----	----	----	----
Nitrogen, total organic	----	EC363/VA	0.050	mg/L		<0.070	----	----	----	----

Page	:	5 of 6
Work Order	:	KS2402923
Client	:	Cariboo Regional District
Project	:	----

Analytical Results

Sub-Matrix: **Water**
(Matrix: **Water**)

Analyte	CAS Number	Method/Lab	LOR	Unit	Client sample ID	Lexington Pump House	----	----	----	----
					Client sampling date / time	24-Jul-2024 11:34	----	----	----	----
						KS2402923-001	---------	---------	---------	---------
						Result	----	----	----	----
Anions and Nutrients										
Sulfate (as SO4)	14808-79-8	E235.SO4/VA	0.30	mg/L		345	----	----	----	----
Cyanides										
Cyanide, strong acid dissociable (Total)	----	E333/VA	0.0050	mg/L		<0.0050	----	----	----	----
Organic / Inorganic Carbon										
Carbon, total organic [TOC]	----	E355-L/VA	0.50	mg/L		1.14	----	----	----	----
Ion Balance										
Anion sum	----	EC101A/VA	0.10	meq/L		16.1	----	----	----	----
Cation sum (total)	----	EC101A/VA	0.10	meq/L		16.5	----	----	----	----
Ion balance (APHA)	----	EC101A/VA	0.010	%		1.23	----	----	----	----
Total Metals										
Aluminum, total	7429-90-5	E420/VA	0.0030	mg/L		<0.0030	----	----	----	----
Antimony, total	7440-36-0	E420/VA	0.00010	mg/L		<0.00010	----	----	----	----
Arsenic, total	7440-38-2	E420/VA	0.00010	mg/L		0.00920	----	----	----	----
Barium, total	7440-39-3	E420/VA	0.00010	mg/L		0.0103	----	----	----	----
Beryllium, total	7440-41-7	E420/VA	0.000100	mg/L		<0.000100	----	----	----	----
Bismuth, total	7440-69-9	E420/VA	0.000050	mg/L		<0.000050	----	----	----	----
Boron, total	7440-42-8	E420/VA	0.010	mg/L		0.143	----	----	----	----
Cadmium, total	7440-43-9	E420/VA	0.0000050	mg/L		<0.0000100 DLM	----	----	----	----
Calcium, total	7440-70-2	E420/VA	0.050	mg/L		50.0	----	----	----	----
Cesium, total	7440-46-2	E420/VA	0.000010	mg/L		0.000015	----	----	----	----
Chromium, total	7440-47-3	E420/VA	0.00050	mg/L		<0.00050	----	----	----	----
Cobalt, total	7440-48-4	E420/VA	0.00010	mg/L		<0.00010	----	----	----	----
Copper, total	7440-50-8	E420/VA	0.00050	mg/L		<0.00050	----	----	----	----
Iron, total	7439-89-6	E420/VA	0.010	mg/L		0.030	----	----	----	----
Lead, total	7439-92-1	E420/VA	0.000050	mg/L		<0.000050	----	----	----	----
Lithium, total	7439-93-2	E420/VA	0.0010	mg/L		0.0040	----	----	----	----
Magnesium, total	7439-95-4	E420/VA	0.0050	mg/L		104	----	----	----	----
Manganese, total	7439-96-5	E420/VA	0.00010	mg/L		0.107	----	----	----	----
Mercury, total	7439-97-6	E508/VA	0.0000050	mg/L		<0.0000050	----	----	----	----
Molybdenum, total	7439-98-7	E420/VA	0.000050	mg/L		0.0463	----	----	----	----
Nickel, total	7440-02-0	E420/VA	0.00050	mg/L		<0.00050	----	----	----	----

Page	:	6 of 6
Work Order	:	KS2402923
Client	:	Cariboo Regional District
Project	:	----

Analytical Results

Sub-Matrix: **Water**
(Matrix: **Water**)

Analyte	CAS Number	Method/Lab	LOR	Unit	Client sample ID	Lexington Pump House	----	----	----	----
					Client sampling date / time	24-Jul-2024 11:34	----	----	----	----
						KS2402923-001	--------	--------	--------	--------
						Result	----	----	----	----
Total Metals										
Phosphorus, total	7723-14-0	E420/VA	0.050	mg/L		0.339	----	----	----	----
Potassium, total	7440-09-7	E420/VA	0.050	mg/L		6.30	----	----	----	----
Rubidium, total	7440-17-7	E420/VA	0.00020	mg/L		0.00246	----	----	----	----
Selenium, total	7782-49-2	E420/VA	0.000050	mg/L		<0.000050	----	----	----	----
Silicon, total	7440-21-3	E420/VA	0.10	mg/L		14.0	----	----	----	----
Silver, total	7440-22-4	E420/VA	0.000010	mg/L		<0.000010	----	----	----	----
Sodium, total	7440-23-5	E420/VA	0.050	mg/L		121	----	----	----	----
Strontium, total	7440-24-6	E420/VA	0.00020	mg/L		0.287	----	----	----	----
Sulfur, total	7704-34-9	E420/VA	0.50	mg/L		125	----	----	----	----
Tellurium, total	13494-80-9	E420/VA	0.00020	mg/L		<0.00020	----	----	----	----
Thallium, total	7440-28-0	E420/VA	0.000010	mg/L		<0.000010	----	----	----	----
Thorium, total	7440-29-1	E420/VA	0.00010	mg/L		<0.00010	----	----	----	----
Tin, total	7440-31-5	E420/VA	0.00010	mg/L		<0.00010	----	----	----	----
Titanium, total	7440-32-6	E420/VA	0.00030	mg/L		<0.00030	----	----	----	----
Tungsten, total	7440-33-7	E420/VA	0.00010	mg/L		0.00017	----	----	----	----
Uranium, total	7440-61-1	E420/VA	0.000010	mg/L		0.000926	----	----	----	----
Vanadium, total	7440-62-2	E420/VA	0.00050	mg/L		<0.00050	----	----	----	----
Zinc, total	7440-66-6	E420/VA	0.0030	mg/L		<0.0030	----	----	----	----
Zirconium, total	7440-67-7	E420/VA	0.00020	mg/L		<0.00020	----	----	----	----

Please refer to the General Comments section for an explanation of any result qualifiers detected.

Please refer to the Accreditation section for an explanation of analyte accreditations.

Page	:	3 of 5
Work Order	:	KS2403321
Client	:	Cariboo Regional District
Project	:	----

Analytical Results

Sub-Matrix: **Water**
(Matrix: **Water**)

Analyte	CAS Number	Method/Lab	LOR	Unit	Client sample ID	307 Lexington	307 Lexington Bypass	----	----	----
					Client sampling date / time	19-Aug-2024 12:04	19-Aug-2024 11:17	----	----	----
						KS2403321-001	KS2403321-002	--------	--------	--------
						Result	Result	----	----	----
Physical Tests										
Absorbance, UV (@ 254nm), unfiltered	----	E405/VA	0.0050	AU/cm		0.0180	0.0270	----	----	----
Alkalinity, bicarbonate (as CaCO3)	----	E290/VA	1.0	mg/L		365	367	----	----	----
Alkalinity, carbonate (as CaCO3)	----	E290/VA	1.0	mg/L		5.4	3.8	----	----	----
Alkalinity, hydroxide (as CaCO3)	----	E290/VA	1.0	mg/L		<1.0	<1.0	----	----	----
Alkalinity, phenolphthalein (as CaCO3)	----	E290/VA	1.0	mg/L		2.7	1.9	----	----	----
Alkalinity, total (as CaCO3)	----	E290/VA	1.0	mg/L		370	371	----	----	----
Colour, true	----	E329/VA	5.0	CU		<5.0	<5.0	----	----	----
Conductivity	----	E100/VA	2.0	µS/cm		1440	1440	----	----	----
Hardness (as CaCO3), from total Ca/Mg	----	EC100A/VA	0.60	mg/L		563	551	----	----	----
Langelier index (@ 15°C)	----	EC105A/VA	0.010	-		1.08	1.16	----	----	----
Langelier index (@ 20°C)	----	EC105A/VA	0.010	-		1.15	1.23	----	----	----
Langelier index (@ 25°C)	----	EC105A/VA	0.010	-		1.22	1.30	----	----	----
Langelier index (@ 4°C)	----	EC105A/VA	0.010	-		0.906	0.989	----	----	----
Langelier index (@ 60°C)	----	EC105A/VA	0.010	-		1.64	1.72	----	----	----
Langelier index (@ 77°C)	----	EC105A/VA	0.010	-		1.83	1.91	----	----	----
pH	----	E108/VA	0.10	pH units		8.46	8.51	----	----	----
Solids, total dissolved [TDS]	----	E162/VA	10	mg/L		1040	1010	----	----	----
Turbidity	----	E121/VA	0.10	NTU		0.15	0.78	----	----	----
Transmittance, UV (@ 254nm), unfiltered	----	E405/VA	1.0	% T/cm		95.9	94.0	----	----	----
Anions and Nutrients										
Ammonia, total (as N)	7664-41-7	E298/VA	0.0050	mg/L		0.0052	<0.0050	----	----	----
Bromide	24959-67-9	E235.Br-L/VA	0.050	mg/L		<0.250 DLDS	<0.250 DLDS	----	----	----
Chloride	16887-00-6	E235.Cl/VA	0.50	mg/L		64.4	64.0	----	----	----
Fluoride	16984-48-8	E235.F/VA	0.020	mg/L		0.145	0.143	----	----	----
Kjeldahl nitrogen, total [TKN]	----	E318/VA	0.050	mg/L		<0.050	<0.050	----	----	----
Nitrate (as N)	14797-55-8	E235.NO3-L/VA	0.0050	mg/L		<0.0250 DLDS	<0.0250 DLDS	----	----	----
Nitrite (as N)	14797-65-0	E235.NO2-L/VA	0.0010	mg/L		<0.0050 DLDS	<0.0050 DLDS	----	----	----
Nitrogen, total organic	----	EC363/VA	0.050	mg/L		<0.050	<0.050	----	----	----

Page	:	4 of 5
Work Order	:	KS2403321
Client	:	Cariboo Regional District
Project	:	----

Analytical Results

Sub-Matrix: Water (Matrix: Water)					Client sample ID	307 Lexington	307 Lexington Bypass	----	----	----
					Client sampling date / time	19-Aug-2024 12:04	19-Aug-2024 11:17	----	----	----
Analyte	CAS Number	Method/Lab	LOR	Unit		KS2403321-001	KS2403321-002	---------	---------	---------
						Result	Result	----	----	----
Anions and Nutrients										
Sulfate (as SO4)	14808-79-8	E235.SO4/VA	0.30	mg/L		354	356	----	----	----
Cyanides										
Cyanide, strong acid dissociable (Total)	----	E333/VA	0.0050	mg/L		<0.0050	<0.0050	----	----	----
Organic / Inorganic Carbon										
Carbon, total organic [TOC]	----	E355-L/VA	0.50	mg/L		1.23	1.17	----	----	----
Microbiological Tests										
Coliforms, total	----	E010/KS	1	MPN/100mL		<1	<1	----	----	----
Coliforms, Escherichia coli [E. coli]	----	E010/KS	1	MPN/100mL		<1	<1	----	----	----
Ion Balance										
Anion sum	----	EC101A/VA	0.10	meq/L		16.6	16.6	----	----	----
Cation sum (total)	----	EC101A/VA	0.10	meq/L		16.5	16.1	----	----	----
Ion balance (APHA)	----	EC101A/VA	0.010	%		-0.302	-1.53	----	----	----
Total Metals										
Aluminum, total	7429-90-5	E420/VA	0.0030	mg/L		<0.0030	<0.0030	----	----	----
Antimony, total	7440-36-0	E420/VA	0.00010	mg/L		<0.00010	<0.00010	----	----	----
Arsenic, total	7440-38-2	E420/VA	0.00010	mg/L		0.00915	0.00892	----	----	----
Barium, total	7440-39-3	E420/VA	0.00010	mg/L		0.0106	0.00948	----	----	----
Beryllium, total	7440-41-7	E420/VA	0.000100	mg/L		<0.000100	<0.000100	----	----	----
Bismuth, total	7440-69-9	E420/VA	0.000050	mg/L		<0.000050	<0.000050	----	----	----
Boron, total	7440-42-8	E420/VA	0.010	mg/L		0.145	0.140	----	----	----
Cadmium, total	7440-43-9	E420/VA	0.0000050	mg/L		<0.0000175 DLM	<0.0000200 DLM	----	----	----
Calcium, total	7440-70-2	E420/VA	0.050	mg/L		49.0	52.4	----	----	----
Cesium, total	7440-46-2	E420/VA	0.000010	mg/L		0.000014	0.000016	----	----	----
Chromium, total	7440-47-3	E420/VA	0.00050	mg/L		<0.00050	<0.00050	----	----	----
Cobalt, total	7440-48-4	E420/VA	0.00010	mg/L		<0.00010	<0.00010	----	----	----
Copper, total	7440-50-8	E420/VA	0.00050	mg/L		0.120	0.140	----	----	----
Iron, total	7439-89-6	E420/VA	0.010	mg/L		0.032	0.032	----	----	----
Lead, total	7439-92-1	E420/VA	0.000050	mg/L		0.000573	0.000265	----	----	----
Lithium, total	7439-93-2	E420/VA	0.0010	mg/L		0.0041	0.0043	----	----	----
Magnesium, total	7439-95-4	E420/VA	0.0050	mg/L		107	102	----	----	----

Page	:	5 of 5
Work Order	:	KS2403321
Client	:	Cariboo Regional District
Project	:	----

Analytical Results

Sub-Matrix: **Water**
(Matrix: **Water**)

Analyte	CAS Number	Method/Lab	LOR	Unit	Client sample ID	307 Lexington	307 Lexington Bypass	----	----	----
					Client sampling date / time	19-Aug-2024 12:04	19-Aug-2024 11:17	----	----	----
						KS2403321-001	KS2403321-002	--------	--------	--------
						Result	Result	----	----	----
Total Metals										
Manganese, total	7439-96-5	E420/VA	0.00010	mg/L		0.0873	0.0990	----	----	----
Mercury, total	7439-97-6	E508/VA	0.0000050	mg/L		<0.0000050	<0.0000050	----	----	----
Molybdenum, total	7439-98-7	E420/VA	0.000050	mg/L		0.0458	0.0464	----	----	----
Nickel, total	7440-02-0	E420/VA	0.00050	mg/L		0.00056	<0.00050	----	----	----
Phosphorus, total	7723-14-0	E420/VA	0.050	mg/L		0.324	0.256	----	----	----
Potassium, total	7440-09-7	E420/VA	0.050	mg/L		6.13	5.93	----	----	----
Rubidium, total	7440-17-7	E420/VA	0.00020	mg/L		0.00250	0.00260	----	----	----
Selenium, total	7782-49-2	E420/VA	0.000050	mg/L		<0.000050	<0.000050	----	----	----
Silicon, total	7440-21-3	E420/VA	0.10	mg/L		14.5	14.0	----	----	----
Silver, total	7440-22-4	E420/VA	0.000010	mg/L		0.000031	<0.000010	----	----	----
Sodium, total	7440-23-5	E420/VA	0.050	mg/L		118	114	----	----	----
Strontium, total	7440-24-6	E420/VA	0.00020	mg/L		0.302	0.294	----	----	----
Sulfur, total	7704-34-9	E420/VA	0.50	mg/L		139	132	----	----	----
Tellurium, total	13494-80-9	E420/VA	0.00020	mg/L		<0.00020	<0.00020	----	----	----
Thallium, total	7440-28-0	E420/VA	0.000010	mg/L		<0.000010	<0.000010	----	----	----
Thorium, total	7440-29-1	E420/VA	0.00010	mg/L		<0.00010	<0.00010	----	----	----
Tin, total	7440-31-5	E420/VA	0.00010	mg/L		0.00080	<0.00010	----	----	----
Titanium, total	7440-32-6	E420/VA	0.00030	mg/L		<0.00030	<0.00030	----	----	----
Tungsten, total	7440-33-7	E420/VA	0.00010	mg/L		0.00017	0.00018	----	----	----
Uranium, total	7440-61-1	E420/VA	0.000010	mg/L		0.00102	0.00105	----	----	----
Vanadium, total	7440-62-2	E420/VA	0.00050	mg/L		<0.00050	<0.00050	----	----	----
Zinc, total	7440-66-6	E420/VA	0.0030	mg/L		0.0060	0.0042	----	----	----
Zirconium, total	7440-67-7	E420/VA	0.00020	mg/L		<0.00020	<0.00020	----	----	----

Please refer to the General Comments section for an explanation of any result qualifiers detected.

Please refer to the Accreditation section for an explanation of analyte accreditations.

Page	:	3 of 3
Work Order	:	KS2404475
Client	:	Cariboo Regional District
Project	:	Drinking Water

Analytical Results Evaluation

Matrix: **Water**

Analyte	CAS Number	Method/Lab	Unit	Client sample ID	Lexington Pump House	----	----	----	----	----	----
				Sampling date/time	22-Oct-2024 10:00	----	----	----	----	----	----
				Sub-Matrix	Water	----	----	----	----	----	----
					KS2404475-001	--------	--------	--------	--------	--------	--------
Total Metals											
Arsenic, total	7440-38-2	E420/VA	mg/L		0.00902	----	----	----	----	----	----

Please refer to the General Comments section for an explanation of any result qualifiers detected.

Please refer to the Accreditation section for an explanation of analyte accreditations.

Summary of Guideline Limits

Analyte	CAS Number	Unit	CDWG MAC						
Total Metals									
Arsenic, total	7440-38-2	mg/L	**0.01 mg/L**						

Please refer to the General Comments section for an explanation of any qualifiers detected.

Key:

CDWG	Canada Guidelines for Canadian Drinking Water Quality (AUG, 2024)
MAC	Maximum Acceptable Concentrations

Page	:	3 of 3
Work Order	:	KS2404782
Client	:	Cariboo Regional District
Project	:	Drinking Water

Analytical Results Evaluation

Matrix: **Water**

Analyte	CAS Number	Method/Lab	Unit	Client sample ID	LEXINGTON (PUMP HOUSE)	----	----	----	----	----	----
				Sampling date/time	13-Nov-2024 10:00	----	----	----	----	----	----
				Sub-Matrix	Water	----	----	----	----	----	----
				KS2404782-001	--------	--------	--------	--------	--------	--------	--------
Total Metals											
Arsenic, total	7440-38-2	E420/VA	mg/L	0.00891	----	----	----	----	----	----	----

Please refer to the General Comments section for an explanation of any result qualifiers detected.

Please refer to the Accreditation section for an explanation of analyte accreditations.

Summary of Guideline Limits

Analyte	CAS Number	Unit	BCDWQG MAC						
Total Metals									
Arsenic, total	7440-38-2	mg/L	**0.01 mg/L**						

Please refer to the General Comments section for an explanation of any qualifiers detected.

Key:

BCDWQG	British Columbia Drinking Water Quality Guidelines (JAN, 2023)
MAC	Maximium Acceptable Concentrations

Page	:	3 of 3
Work Order	:	KS2404879
Client	:	Cariboo Regional District
Project	:	Drinking Water

Analytical Results Evaluation

Matrix: **Water**

Analyte	CAS Number	Method/Lab	Unit	Client sample ID	Lexington Water System Pump House Well Pump	----	----	----	----	----	----
				Sampling date/time	18-Nov-2024 12:41	----	----	----	----	----	----
				Sub-Matrix	Water	----	----	----	----	----	----
				KS2404879-001		--------	--------	--------	--------	--------	--------
Physical Tests											
Colour, true	----	E329/VA	CU		<5.0	----	----	----	----	----	----
Organic / Inorganic Carbon											
Carbon, total organic [TOC]	----	E355-L/VA	mg/L		1.08	----	----	----	----	----	----

Please refer to the General Comments section for an explanation of any result qualifiers detected.

Please refer to the Accreditation section for an explanation of analyte accreditations.

Summary of Guideline Limits

Analyte	CAS Number	Unit	BCDWQG AO						
Physical Tests									
Colour, true	----	CU	**15 CU**						
Organic / Inorganic Carbon									
Carbon, total organic [TOC]	----	mg/L	--						

Please refer to the General Comments section for an explanation of any qualifiers detected.

Key:

BCDWQG	British Columbia Drinking Water Quality Guidelines (JAN, 2023)
AO	Aesthetic Objective/Other Value

Page	:	3 of 3
Work Order	:	KS2405002
Client	:	Cariboo Regional District
Project	:	Drinking Water

Analytical Results Evaluation

Matrix: **Water**

Analyte	CAS Number	Method/Lab	Unit	Client sample ID: Lexington (Pump House)	----	----	----	----	----	----
				Sampling date/time: 26-Nov-2024 10:52	----	----	----	----	----	----
				Sub-Matrix: Water	----	----	----	----	----	----
				KS2405002-001	--------	--------	--------	--------	--------	--------
Physical Tests										
Colour, true	----	E329/VA	CU	<5.0	----	----	----	----	----	----
Organic / Inorganic Carbon										
Carbon, total organic [TOC]	----	E355-L/VA	mg/L	1.26	----	----	----	----	----	----

Please refer to the General Comments section for an explanation of any result qualifiers detected.

Please refer to the Accreditation section for an explanation of analyte accreditations.

Key:

Page	:	3 of 3
Work Order	:	KS2405316
Client	:	Cariboo Regional District
Project	:	Lexington

Analytical Results Evaluation

Matrix: **Water**

Analyte	CAS Number	Method/Lab	Unit	Client sample ID	Pump House - Well-Raw	----	----	----	----	----	----
				Sampling date/time	17-Dec-2024 10:45	----	----	----	----	----	----
				Sub-Matrix	Water	----	----	----	----	----	----
				KS2405316-001	--------	--------	--------	--------	--------	--------	--------
Total Metals											
Arsenic, total	7440-38-2	E420/VA	mg/L	0.00946	----	----	----	----	----	----	----

Please refer to the General Comments section for an explanation of any result qualifiers detected.

Please refer to the Accreditation section for an explanation of analyte accreditations.

Summary of Guideline Limits

Analyte	CAS Number	Unit	BCDWQG MAC						
Total Metals									
Arsenic, total	7440-38-2	mg/L	**0.01 mg/L**						

Please refer to the General Comments section for an explanation of any qualifiers detected.

Key:

BCDWQG	British Columbia Drinking Water Quality Guidelines (JAN, 2023)
MAC	Maximium Acceptable Concentrations

Appendix C: Emergency Plans

2025 Cariboo Regional District

Emergency Response & Contingency Plan

Lexington Water System

Utilities, Communications, and Emergency Operations Departments
1-1-2025

By Kelly McDonald, Cheryl McMullen, Gerald Pinchbeck, Ken Heidema and Charles Howes

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SECTION 1: Emergency Plan Goals

The Objective of the Cariboo Regional District (CRD) Emergency Response and Contingency Plan (ERCP) is to provide staff and regulatory agencies with a guideline for potential water utility related emergencies.

This Emergency Response and Contingency Plan (ERCP) serves as a guideline to address various emergency situations, recognizing that no two emergencies are exactly alike. Each emergency is described with a general sequence of steps to follow, providing both a structured approach to response and a consistent method for documenting actions taken. Task lists within each emergency section also function as checklists to remind staff of critical items to consider and complete during an emergency. This ERCP includes specific protocols and considerations for the CRD water supply system.

This plan has been prepared to guide the Cariboo Regional District to respond to an emergency arising in the operation of the Lexington Water System. The purpose of the ERCP is to:

- ✓ Ensure staff and the public's safety in carrying out emergency tasks.
- ✓ Provide the earliest and safest response to an emergency condition.
- ✓ Ensure that water quality and public health are not compromised.
- ✓ Ensure that water for firefighting is available.
- ✓ Restore normal water system operation.
- ✓ Protect the natural environment from impacts associated with the system operation in the event of an emergency.
- ✓ Contain property damage.

1.1. Resiliency in Operations

Operational resiliency refers to the capability of an operation to adjust, adapt, and maintain service delivery under emergency conditions. The objective for the CRD Water Utility is to achieve high operational resiliency. Indicators of operational resiliency include the following:

1.1.1. **Emergency Response Plan**: A comprehensive ERP is essential in building resilience within operations, providing structured guidance for handling emergencies effectively. This document is an integral part of that resiliency framework.

1.1.2. **Regional Agency Coordination**: The ERCP must be shared with regional emergency response agencies, ensuring cohesive support. The CRD Emergency Operations Department serves as the local staging agency for the Provincial Emergency Program.

1.1.3. **Mutual Aid Agreements**: In certain emergencies, the CRD may need support from neighboring water utilities. Williams Lake is a nearby utility from which the CRD may

seek assistance in the future. The CRD is working toward a formal mutual aid agreement based on community protection principles.

1.1.4. **Emergency Power**: The Lexington Water System can operate on gravity-fed supply. A standard battery pack is on hand to maintain disinfection if the power grid fails.

1.1.5. **Ability to Meet Water Demands**: While the water system meets current demands, the reservoir is small, and there are no fire hydrants in the service area.

1.1.6. **Critical Parts Inventory:** Appendix B provides a list of critical parts and their availability. Appendix A includes contact names for Cariboo support agencies offering specialized parts or services.

1.1.7. **Critical Staff Resiliency:** Staff's ability to respond and remain calm during extreme events is only evident when tested. Training and reinforcement of sound decision-making at all levels will support preparedness for emergency situations.

SECTION 2: How to Use This Plan

The Water System Emergency Response and Contingency Plan (ERCP) is a guide for handling water system emergencies. The “Actions” section outlines various potential emergencies and provides steps to help minimize further damage.

After an emergency, the CRD will complete a Post Incident Report (see Appendix D). Regular review exercises and updates will strengthen our emergency response capabilities. We ask all plan holders to participate and offer recommendations to continually improve the ERCP.

Remember, the ERCP is only effective if everyone reviews, understands, and contributes to its ongoing development.

SECTION 3: Emergency Planning Definitions

This section provides emergency planning definitions used in this document, following *AWWA Manual 19: Emergency Planning for Water Utilities*.

Emergency: An unexpected event that may compromise water quality or reduce the availability of domestic, irrigation, or fire flow water for the community.

Minor Emergency: A localized, routine incident impacting a small number of customers, such as a small pipe break, vehicle collision with a hydrant, brief power outage, or minor service repair. Minor emergencies should be manageable without special resources and, if effectively handled, can be prevented from escalating into major emergencies.

Major Emergency: A significant event affecting a large portion of the water system, posing risks to water quality or quantity and potentially endangering community health and safety. Major emergencies are rare but impactful.

Natural Disaster: Events caused by natural forces beyond human control, including wildfires, earthquakes, floods, tornadoes, heat domes, freezing, and other severe weather-related incidents.

Human-Caused Disaster: Disasters resulting from human actions, whether accidental or intentional. These may include human error, accidents, labor disputes, negligence, vandalism, sabotage, terrorism, biological contamination, or chemical spills.

Hazard: A source of potential harm or danger linked to a disaster, such as unstable slopes from a creek wash-out or ground shaking from an earthquake.

Lifeline Supply: Essential community services that support health, safety, and sustenance. Lifeline utilities include water, wastewater, electricity, and natural gas, as well as critical transportation, communication, healthcare, and emergency operations centres.

SECTION 4: Emergency Scenarios

4.1. Introduction

Sections 5 and 6 list potential water system emergencies related to the physical components of the water supply. Section 7 describes the steps for a cyber threat or vandalism.

4.2. Emergency Scenario Format

Each emergency scenario in this ERCP follows a consistent format:

4.2.1. **Description of Emergency**: Describes each potential emergency for easy reference. Sections 5 and 6 cover physical water service issues, while Section 7 addresses cyber incidents and vandalism.

4.2.2. **Indicators**: Outlines how each emergency can be recognized, either by CRD staff or external contacts.

4.2.3. **Actions**: Lists response steps for CRD staff, generally in recommended order. This list serves as a guideline, and the lead Water Operator can use the provided checklist to verify all necessary actions are taken.

4.2.4. **Contacts**: Lists relevant contact agencies; specific contacts are found in the ERCP's Communications Section.

4.2.5. **Event Record**: A checklist at the page bottom summarizes the event, records whether photos were taken, and tracks emergency reporting.

All events, including minor repairs and leaks, should be documented and sent to the CRD Office for electronic filing. Each event should be recorded by date. Large events should have dedicated folders containing photos and data, following a standardized naming protocol.

SECTION 5: Water Supply Contamination

Description of Emergency: Contamination has been detected or possible contamination is present.

Indicators: Public notification (taste, odour or colour observations), poor water sample results, visible observations made by Water Operators, cross connection with potential contamination.

5.1. Potential Causes

5.1.1. Chemical Spill (e.g. transport truck, industry)
5.1.2. Flood Event
5.1.3. Confirmed Cross Connection
5.1.4. System Breach (e.g. water main break) *see 6.2.
5.1.5. Positive Sample Result (e.g. E. coli or other immediate threat to public health contaminant)
5.1.6. Vandalism

Actions:

1) Notify Water Operator.
2) Notify Drinking Water Officer (DWO).
3) Assess threat level (see Appendix B).
4) Notify Communications Department.
5) Water Operators to investigate site and inform Manager of Utilities of possible situation. Manager to contact Interior Health.
6) Confirm that the source of contaminant is mitigated.
7) If chemical contamination confirmed or highly suspected to be present:
    a) Attempt to isolate.
    b) Discuss with Engineer, Biologist/Chemist (Lab) and DWO to develop a reasonable and representative sampling program.
    c) Contact Lab and arrange bottles if required and collect samples for rush analysis.

8) Report any spills to the Provincial Agency responsible (see Appendix A).

9) In an extreme situation of contamination, consider shutting down all supply pumps.

    a) Pump station would shut off and "Do Not Use" notices would be provided to the public. CRD senior management would make this call.

10) Communication: Begin public notification if required and follow Water Quality Notification Procedures.

11) Continue discussion with appropriate experts for moving forward.

12) Discussions to consider alternate water source if needed. Involve Emergency Operations Department and Notify Fire Department.

13) Continue monitoring until water quality is back to normal and IH gives approval to lift advisory or notice.

14) Complete documentation:

    a) Record of events, include times and dates.
    b) Complete a comprehensive damage assessment.
    c) Investigate potential causes.
    d) After action report.

SECTION 6: Supply Disruption

6.1. Equipment Failure

Description of Emergency: This type of emergency is typically caused by extreme weather events that place a very high demand on the Water Treatment Plant, or any other situation where water demands are high, and equipment or infrastructure reduces the ability to maintain maximum output.

Indicators: Visual observations by Water Operators. Failure of equipment as identified by SCADA and alarms.

Actions:

1) Document Situation: Note date, time, location and means of event recognition.

2) Notify Water Operator.

3) Notify Manager.

4) Notify Communications Department.

5) If cause is identified as a main break, see section 6.2.

6) Well Site Investigation: Generally, this problem is caused by high flows and overheating VFD's.

7) Check in the pumphouse for mechanical issues such as temperatures on variable frequency drive (VFD) displays.

8) Check all SCADA pages and trends to determine what is operational, what has failed, or what is at risk of failure.

9) Check on alarms.

10) Note status of chlorine disinfection, reservoir level, source pump status, chemical dosing status, and raw water flows.

11) Check all necessary equipment to confirm proper functionality.

12) Check inventory for parts that may be available to aid in necessary repairs. If necessary, contact Williams Lake Public Works for assistance.

13) If the issue stems from the VFD's, allow to cool and contract electrician if necessary.

14) If issue is due to drawdown in Supply Well, consult Drought Management Plan (Appendix C) and proceed to next step.

15) If problem persists:

- ✓ Communicate with Interior Health, issue an advisory as recommended (see Section 1).
- ✓ Implement emergency water restrictions (Communications Department).
- ✓ Contact Williams Lake Fire Department and CRD Protective Services Department to inform them of the situation.

16) Complete documentation:

a) Record of events, include times and dates.
b) Complete a comprehensive damage assessment.
c) Investigate potential causes.

6.2. Supply Main Break

Description of Emergency: Failure or damage to a water supply main causing loss of water and/or pressure.

Indicators: SCADA alarms indicating pressure loss, calls from residents or staff observations.

Actions: Steps to be taken by CRD staff:

1) Contact Manager of Utilities.
2) Contact Water Operator.
3) Determine location.
4) Stop the flow of water by closing valves and isolating the break, depending on the scale of the break (see chart in Appendix B); attempt to maintain positive pressure.
5) Contact Manager and describe the emergency.
6) Determine what section of the system has been affected by the depressurization.
7) If there is a potential that the system has been contaminated, the Manager of Utilities will contact Interior Health for recommendations on issuing a Water Advisory. See Appendix E (follow Communications procedures).
8) Make the site safe by implementing traffic control: block road, if necessary, contact traffic control contractor (see Appendix A).
9) If possible, mitigate danger to the public and further damage of infrastructure or property. If necessary and feasible, set up sediment control measures and de-chlorinated water released.
10) Assess immediate damage.
11) Coordinate repair plans with appropriate contractors (see contacts).
12) Contact the Provincial Agency responsible (see Appendix) for large discharges of chlorinated water including;
13) If there is significant sediment or chlorinated water in streams.
14) Call Fire Department to inform them when hydrants are in or out of service.
15) Complete documentation:
    a) Record of events, include times and dates.
    b) Complete a comprehensive damage assessment.
    c) Investigate potential causes.
    d) After action report.

6.3. Extended Loss of BC Hydro Power Supply

Description of Emergency: The loss of power will stop the pumping systems to supply water to the distribution system and from filling the reservoir. With no power, a full reservoir has approximately 48 hours of water available.

Indicators: SCADA alarms

Actions:

1) Source a generator.
2) Change system settings if necessary to keep reservoirs topped up.
3) If sudden phase loss or total power loss causes equipment failure see Section 6.
4) If issues with power supply persist:
   - ✓ Contact BC Hydro for information on the timelines for power restoration.
   - ✓ Communicate with Interior Health, issue an advisory as recommended (see Section 1).
   - ✓ Implement emergency water restrictions (Communications Department).
   - ✓ Potentially throttle down the pressure within the distribution to reduce water loss (always above 20 psi).
   - ✓ Contact Williams Lake Fire Department and CRD Protective Services Department to inform them of the situation.

6.4. Operator Transportation Routes Compromised

6.4.1. Potential Causes

- Forest fire
- Accident
- Mechanical issues with vehicle
- Construction

Description of Emergency: The usual transportation route to the Lexington area is blocked (e.g., by a forest fire or accident), and no operator can be onsite to perform duties.

Actions:

1) Contact Manager of Utilities.
2) Manager will inform Interior Health Officer of situation.
3) Continue to monitor system using SCADA.
4) If issue persists:
   - ✓ Contact Williams Lake or other Regional Operators for assistance.

- ✓ Reach out to local contact if physical checks are needed. Preferably local contractor with system experience (see Appendix A).
- ✓ Contact the Communications Department to issue applicable advisories (at the recommendation of Interior Health).

5) Complete documentation:

   a) Record of events, include times and dates.
   b) Complete a comprehensive damage assessment.
   c) Investigate potential causes.

SECTION 7: Cyber Incident

(Omitted for security reasons.)

SECTION 8: Drought

8.1 Introduction

Drought is often caused by a long duration of inadequate rainfall or snowmelt to replenish the level of the water source. It can also be the result of a breakdown in a crucial piece of a water system's infrastructure; or a prolonged issue with water quality that prevents the supply of potable water for an extended period. All of these circumstances can result in a significant depletion in the source capacity or even a complete loss of source. The Cariboo Regional District's Drought Management Plan for the Lexington Water System serves as a guide to monitoring, managing and conserving water use in the event of an impending drought. The objectives of this Plan are to:

1) Identify the priority users of the water supply.
2) Provide direction on water conservation before and during the drought period.
3) Establish a guideline for communicating issues and instructions to users and other key contacts.
4) List supplemental or alternate sources of potable water in the event of a prolonged drought.

Appendix C outlines the Cariboo Regional District's Drought Management Plan.

Appendix A: Contacts

(Omitted for security reasons.)

Appendix B: Charts

Water Main Break

Water Main Break Severity Chart				
Class 1	*Class 2*	*Class 3*	*Class 4*	*Class 5*
Routine	*Minor*	*Substantial*	*Major*	*Catastrophic*
Small enough to leave until repairs are convenient	Water Pooling	Isolation Needed	Large area needs to be isolated	Complete Distribution System Shut down
Positive Pressure Maintained	Positive Pressure Maintained	Positive Pressure may not be possible	Loss of Pressure in large area of distribution system	Complete system pressure loss (e.g. drained reservoir)
Consult with DWO if any concerns.	Advisory may be required, consult with DWO.	Advisory Needed, contact Interior Health. Assess damage.	Advisory needed, contact interior health. Assess damage	Advisory needed, contact interior Health. initiate EOC.
Flush line (localized)	sample for bacteriological contamination after flushing lines as per C651-14 (localized)	Sample for bacteriological contamination after flushing lines as per AWWA C651-14	Chemical and bacteriological sampling may be needed. Possible unidirectional flushing and super chlorination needed as per AWWA C651-14	Chemical and bacteriological sampling needed at various points in the system. System wide flushing needed. Super chlorination required as per AWWA C651-14

Critical Parts Inventory

Critical Parts Inventory							
Part	Use	Location Stored	Vendor	Part	Use	Location Stored	Vendor

Appendix C: Drought Management Plan

DROUGHT MANAGEMENT PLAN

Priority Users

The area served by the Lexington Water System is comprised of an estimated 72 residents. In a drought situation, the provision of water will be prioritized as follows:

Priority Level	User	Comments
1	Residents	The CRD is obligated to provide water to the residents served by the Lexington Water System for basic health and sanitation needs.

Water Restrictions and Conservation Measures

The following restrictions will be imposed and conservation measures recommended to Lexington Water System users at various stages prior to and during a drought:

STAGE 1: PREPAREDNESS	
Permitted Uses	**Restrictions**
Drinking water Bathing Handwashing dishes or using dishwasher Washing machine Watering plants with a hose or watering can Bathing pets. Washing vehicles.	May 1 to Oct. 1: Lawn watering on reduced days for reduced hours, per bylaws.
	Conservation Measures
	Install water-saving devices.
STAGE 2: IMPENDING DROUGHT – CONSERVATION	
Permitted Uses	**Restrictions**
Drinking water Bathing Handwashing dishes or using dishwasher Washing machine Watering plants with a hose or watering can	Lawn watering days and hours restricted further. Wash vehicles only if absolutely necessary.
	Conservation Measures
	Bathe pets only as needed. Use washing machine for full loads only. Use dishwasher for full loads only.
STAGE 3: DROUGHT – RESTRICTIONS	
Permitted Uses	**Restrictions**
Drinking water (all users) Bathing Handwashing dishes or using dishwasher Washing machine	No watering of lawns or watering of plants, per bylaws. No bathing of pets unless absolutely necessary. No washing of vehicles. No filling of swimming pools. No power-washing.
	Conservation Measures
	Bathe only as needed and/or reduce time in shower. Use washing machine for full loads only. Use dishwasher for full loads only.

Communication Plan

Communication between the CRD and users of the Lexington Water System, as well as with key operational contacts, is imperative during an emergency situation. Providing timely and clear

information and instructions greatly reduces confusion, frustration and anxiety, and enables outside agencies to provide assistance more effectively if needed.

STAGE 1: PREPAREDNESS	
Water use is routinely higher from mid-Spring to the end of Summer each year due to less rainfall, increased lawn and garden maintenance, swimming pools, more frequent car-washing and showers, etc. Water levels are constantly monitored, and watering restrictions are put in place annually from May 1 to October 1 as a preventative measure to minimize depletion of the water supply during these months.	
Procedures (Concurrent)	Target
Finance Dept. mails notice of water restrictions and water conservation recommendations with annual utility bills in April of each year.	Residents
Communications Dept. posts notice of water restrictions and water conservation recommendations on website and social media.	All users of the Lexington Water System
Communications Dept. sends notice of water restrictions and water conservation recommendations by email.	Subscribed users.
Water Operators post notice of water restrictions and water conservation recommendations on bulletin boards at 108 Mall, gas station, mailboxes	Users of the Lexington Water System who don't have access to a computer.

STAGE 2: POTENTIAL THREAT – DIMINISHED WATER SUPPLY		
If there is little snowmelt in the Spring and rainfall in the Spring/Summer is not enough to bring the source of the water supply to an adequate level, further restrictions on water use may be required. Prolonged water quality issues may result in having to obtain water from an alternate source until rectified. Any significant or ongoing issues would indicate that action is required to prevent the possibility of a water supply crisis.		
Procedures		**Target**
1.	Inform key contacts of possible threat to water source: Water Operators notify Manager of Utilities Manager of Utilities informs other key contacts	Manager of Utilities Drinking Water Officer Electoral Area Director Manager of Fire Administration
2.	At Interior Health's direction, Manager of Utilities and Communications Dept. have public notice mailed to users, posted on website, social media, and on local bulletin boards.	All users of the Lexington Water System
	Communications Dept. sends public notice by email.	Subscribed users
3.	Manager of Utilities notifies CRD Managers involved in Emergency Planning as a precautionary measure.	Chief Administrative Officer Manager of Communications Manager of Emergency Programs
4.	Manager of Utilities, Water Operators and Electoral Area Director hold public meeting to discuss potential drought, further restrictions required and recommended conservation measures.	All users of the Lexington Water System
5.	Manager of Utilities notifies other agencies as a precautionary measure that assistance may be required if situation can't be rectified.	City of Williams Lake Ministry of Water, Land and Resource Stewardship Ministry of Emergency Management and Climate Readiness

STAGE 3: EMERGENCY – SIGNIFICANT DEPLETION OR LACK OF SOURCE
The following situations are considered critical: • An inability to keep the water supply at a level that will provide enough water to meet the basic health and sanitation needs of the users.

• A prolonged issue with the water system infrastructure that results in the inability to provide water to the users. • A severe or prolonged water quality issue that cannot be easily rectified. • The inability to provide an adequate water supply for fire protection. • An ongoing water supply issue that results in significant losses for businesses in the service area.		
Procedures		**Target**
1.	Inform key contacts of crisis situation. Discuss further steps: Water Operators inform Manager of Utilities. Manager of Utilities notifies other key contacts.	Manager of Utilities Drinking Water Officer Electoral Area Director Chief Administrative Officer Manager of Fire Administration Manager of Communications Manager of Emergency Programs
2.	At Interior Health's direction, Manager of Utilities and Communications Dept. have public notice mailed to users, and posted on website, social media, and local bulletin boards.	All users of the Lexington Water System
	Communications Dept. sends notice of emergency situation by email and via Voyent Alert.	Subscribed users
3.	Manager of Utilities and Communications Dept. post notice in local newspaper; make radio announcements.	All users of the Lexington Water System
4.	Manager of Utilities, Water Operators and Electoral Area Director hold public meeting to discuss further steps.	All users of the Lexington Water System
5.	Manager of Utilities notifies other agencies. Discuss what assistance may be available.	City of Williams Lake Ministry of Water, Land and Resource Stewardship Ministry of Emergency Management and Climate Readiness

Supplemental or Alternate Sources of Potable Water

Supplemental or Alternate Source	Contact Information	Capacity Available	Estimated Time To Deliver	Estimated Cost
Backup Water Source				
Reservoir Rental Company				
Bulk Haul Water	Triple P Sanitation (upon verification of IH permit)	Not specified		
Other Water Supplier	Triple P Sanitation (upon verification of IH permit)	Not specified		
Bottled Water	Cariboo Water Purification Centre Cool Clear Water Williams Lake Water Factory	Not specified Not specified Not specified	 Pick up only	 $5.00 / 5 Gal $3.00 / 3 Gal

Operational Procedures

Action		Person Responsible
1	Ensure pump is shut off (to protect pump).	Water Operator
2	Notify all users by social media, email distribution, radio and public bulletins. High risk users to be notified by telephone call. Situationally assessed for best means of communication process.	Manager of Utilities Manager of Communications
3	Contact government agencies (see below) for advice and assistance.	Manager of Utilities
4	Arrange alternate source (e.g. bottled water, bulk hauler and storage tank).	Manager of Utilities

Government Agency Contacts:

- Drinking Water Officer
- Local government's Emergency Program Coordinator
- Ministry of Forests, Lands and Natural Resource Operations
- Others as necessary, depending on severity (ie. Fire Department)

Appendix D: Templates

Damage Assessment Summary (EOC 415)

DAMAGE ASSESSMENT SUMMARY				
	Event:	**Time:**		**Date:**
	Operational Period:	**PEP Task #:**		**Position:**
		Number	**Estimated Value**	**Comments**
Public Property	▪ Municipal Facilities Damaged			
	▪ Municipal Facilities Destroyed			
	▪ Public Facilities Damaged			
	▪ Public Facilities Destroyed			
	▪ Provincial Facilities Damaged			
	▪ Provincial Facilities Destroyed			
	▪ Federal Facilities Damaged			
	▪ Federal Facilities Destroyed			
	▪ Roads Damaged			
	▪ Roads Destroyed			
	▪ Bridges Damaged			
	▪ Bridges Destroyed			
	▪ Railroads Damaged			
	▪ Railroads Destroyed			
	▪ Water Supply Damaged			
	▪ Sewers Damaged			
	Total Public Damage:			
Private Property	▪ Residential Buildings Damaged			
	▪ Residential Buildings Destroyed			
	▪ Businesses Damaged			
	▪ Businesses Destroyed			
	▪ Agriculture Damaged			
	▪ Agriculture Destroyed			
	Total Public Damage:			
Priority Repairs/Restoration:				
Prepared By:			**Date and Time:**	

Action Plan (EOC 502)

EOC ACTION PLAN			
Event:		**Date:**	**Time:**
Operational Period:	**PEP Task #:**	**Prepared By:**	

Objectives: (In priority order, for the designated operational period)		
Tasks/Action Items:	**Function Assigned**	**Estimated Completion Time**

Attachments: (Check if attached)

☐	Organization Chart	☐	Public Information Plan	☐	Communication Plan
☐	EOC Floor Plan	☐	Transportation Plan	☐	
☐	Situation Map	☐	Evacuation Plan	☐	

Recommended By (Planning Section Chief):	**Approved By** (EOC Director):

Distribution:

- ☐ EOC Director
- ☐ Risk Management Officer
- ☐ Liaison Officer
- ☐ Information Officer
- ☐ Posted for ALL EOC Personnel
- ☐ Operation Section Chief
- ☐ Planning Section Chief
- ☐ Logistics Section Chief
- ☐ Finance/Administration Section Chief
- ☐ Other _____

Situation Report (EOC 501)

EOC Situation Report

Community / Local Authority: _____

Date and Time: _____

PEP Task Number: _____

Prepared By: ☐ Community / Local Authority
☐ PREOC Operational Area Coordinator

Approved By: _____
(Name and Position)

EOC Contact:	**Report Type:**
Name: _____	☐ Initial
Position: _____	☐ Update #_____
_____	☐ Final
Phone #: _____	**Situation Forecast:**
Fax #: _____	☐ Improving
E-mail: _____	☐ Unchanged
	☐ Deteriorating

Highlights (*Situational Overview – Key Points*):

Current Priority Needs: (*Resources / Information / Support*):

Resource Request Attached: ☐ Yes ☐ No

People Impacted (*Estimated / Confirmed*):

# Evacuated	# Injured	# Homeless*	# Missing	# Dead	# Hospitalized

* *As a result of the emergency event*

Event Log (EOC 414)

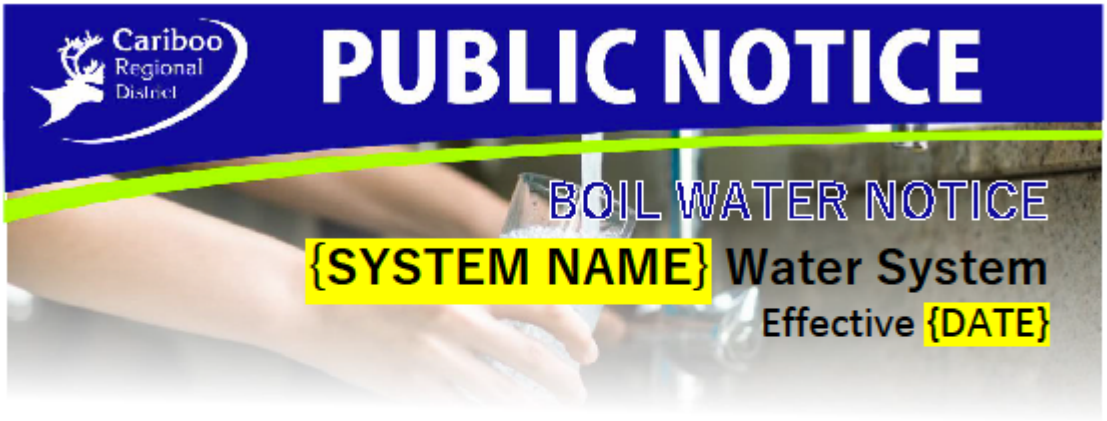
POSITION LOG

Event:	Section:	Position:
Operational Period:	PEP Task #:	Date:

LOG

Time (24 Hr.)	To	From	Action	Follow-Up	Closed

Appendix E: Communications Templates



The Cariboo Regional District has issued a Boil Water Notice to users of the {SYSTEM NAME} Water System, pursuant to a request of a Drinking Water Officer under Section 14 of the *Drinking Water Protection Act*. This Notice remains in effect until further notice.

The Cariboo Regional District's water systems are tested regularly to ensure they meet public health regulations. This boil water notice is being issued because {REASON}. This notice is being issued {CHOOSE: as a precautionary measure to protect public health. OR in order to protect public health and safety from significant health risks presented by pathogens in the water supply.}

All users of the {WATER SYSTEM NAME} Water System are asked to bring water to a rolling boil for a minimum of one minute before using water from the system for:

Drinking (or use an alternate, safe source of water)
Cooking (if not boiled)
Brushing teeth
Washing Dishes
Washing fruits or vegetables to be eaten raw
Watering animals

Also, please use hand sanitizer after washing hands.

If you have further questions, please call Environmental Services at 1-800-665-1636 during regular office hours.

For more information about boil water advisories and service interruptions in the CRD and what to expect, visit cariboord.ca/water-notices-and-advisories. To receive updates on CRD water systems and other relevant information within the CRD, residents are reminded to subscribe to the latest news on our website at cariboord.ca/subscribe. Residents can also sign up the Cariboo Chilcotin Emergency Notification System to be notified directly of emergency orders and alerts or utility service interruptions at cariboord.ca/EmergencyNotifications.

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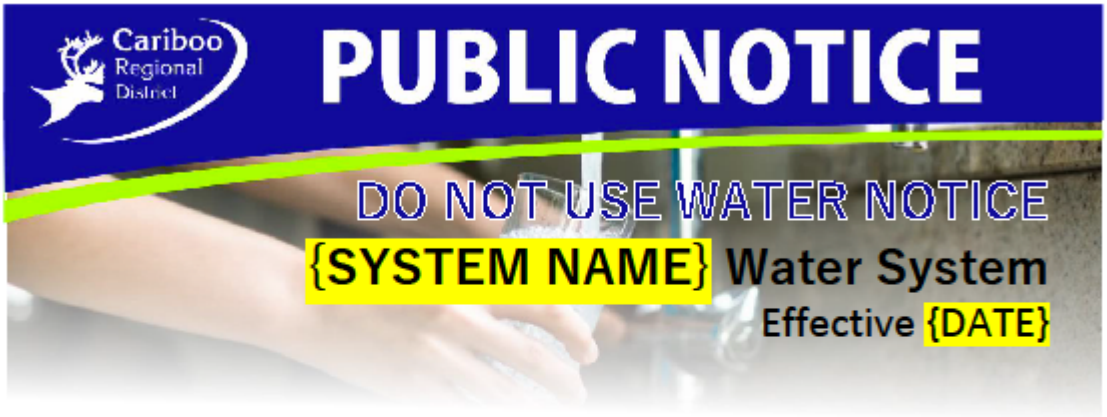

The Cariboo Regional District has issued a Do Not Use Notice to users of the {SYSTEM NAME} Water System, pursuant to a request of a Drinking Water Officer under Section 14 of the *Drinking Water Protection Act*. This Notice remains in effect until further notice.

The Cariboo Regional District's water systems are tested regularly to ensure they meet public health regulations. Due to the presence of {if known, be specific, or if unknown say "contaminants in the water supply posing an immediate threat to resident's safety}, the Cariboo Regional District is implementing this until further notice. Follow all instructions below:

All users of the {WATER SYSTEM NAME} Water System are asked to immediately stop using water from the system for any purpose. This includes: drinking, making beverages or ice, brushing teeth, preparing or washing food, bathing, water for animals, washing anything (including vehicles), and watering plants.

Do not turn your taps on for any reason. Boiling water will NOT make it safe! Water from your hot water tank may also be unsafe, and you are advised to consult a qualified plumber before draining the tank.

The Cariboo Regional District has contacted Interior Health and the Ministry of Environment to request their cooperation in investigating this matter. In addition, the Cariboo Regional District is taking immediate acton to find another source of water supply for residents of {WATER SYSTEM NAME}.

During this time, an alternate water source will be available at {ADDRESS AND OPERATING HOURS}.

If you have further questions, please call Environmental Services at 1-800-665-1636 during regular office hours.

For more information about boil water advisories and service interruptions in the CRD and what to expect, visit cariboord.ca/water-notices-and-advisories. To receive updates on CRD water systems and other relevant information within the CRD, residents are reminded to subscribe to the latest news on our website at cariboord.ca/subscribe. Residents can also sign up the Cariboo Chilcotin Emergency Notification System to be notified directly of emergency orders and alerts or utility service interruptions at cariboord.ca/EmergencyNotifications.

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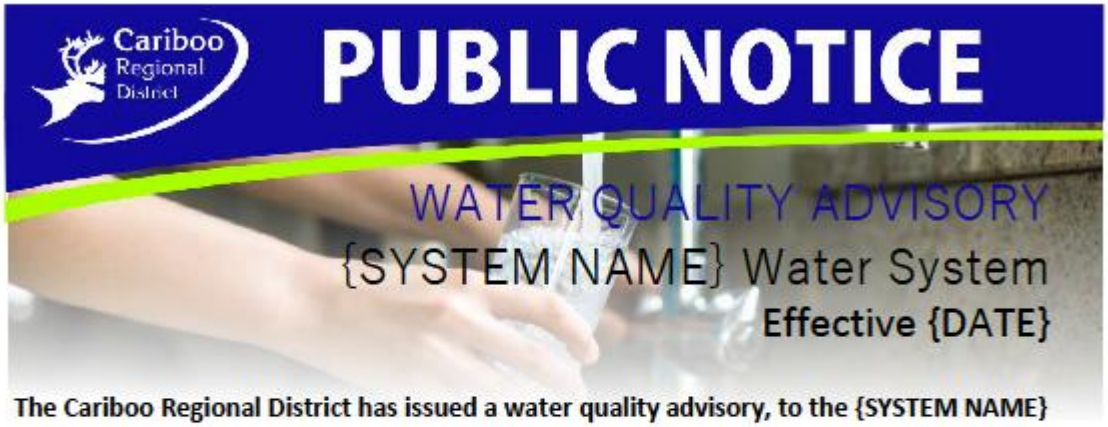

The Cariboo Regional District has issued a water quality advisory, to the {SYSTEM NAME} Water System users because of {issue} levels exceeding the *Guidelines for Canadian Drinking Water Quality*. This Advisory remains in effect until further notice.

The Cariboo Regional District's water systems are tested regularly to ensure they meet public health regulations. Health Canada's Guidelines for Drinking Water has established a maximum acceptable concentration (MAC) for {issue} in drinking water of {standard}. Recent water samples submitted show {issue} concentrations that exceed the MAC.

Add information provided by Health Canada or Interior Health about the nature of the water quality advisory. This section requires approval from a Drinking Water Officer.

{Other safety instructions or advisories. I.e. is the water safe for other non-consumption purposes, how does boiling water impact it, etc.}

If you have further questions, please call the Environmental Services department at 1-800-665-1636 during regular office hours.

*For more information about boil water advisories and service interruptions in the CRD and what to expect, visit **cariboord.ca/water-notices-and-advisories**. To receive updates on CRD water systems and other relevant*

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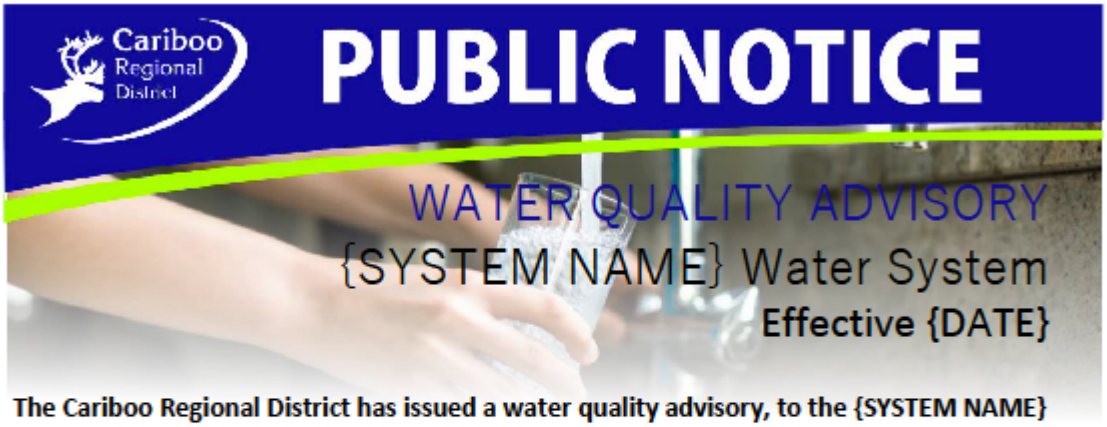

The Cariboo Regional District has issued a water quality advisory, to the {SYSTEM NAME} Water System users because of manganese (Mn) levels exceeding the *Guidelines for Canadian Drinking Water Quality*. This Advisory remains in effect until further notice.

The Cariboo Regional District's water systems are tested regularly to ensure they meet public health regulations. Health Canada has established a maximum acceptable concentration (MAC) for manganese in drinking water of 0.12 mg/L. Recent water samples submitted show manganese concentrations that exceed the MAC.

Manganese (Mn) is an element found in air, food, soil and drinking water. While a small amount of Mn is essential for human health, new Health Canada research has shown drinking water with too much Mn can be a risk to health for infants and young children.

Infants and young children are the most sensitive and vulnerable population, as their bodies absorb more manganese and cannot regulate or remove the chemical as readily as adults and older children. As a result, the **drinking water from this system must not be used to prepare formula for bottle-fed infants**. An alternate source of safe drinking water, such as bottled water, must be used when preparing formula for infants and young children. **Boiling the water will not lower the manganese level.**

Breastfed infants are generally considered at lower risk to manganese exposure as the transfer of manganese to breast milk is limited. Pregnant or breastfeeding women who have concerns may wish to use a safe, alternate source of drinking water or consult with a healthcare professional.

Water exceeding the MAC for manganese can be used for cooking and drinking by non-vulnerable groups and is still considered safe for hand washing, bathing and showering. If you have further questions, please call the Environmental Services department at 1-800-665-1636 during regular office hours.

*For more information about boil water advisories and service interruptions in the CRD and what to expect, visit **cariboord.ca/water-notices-and-advisories**. To receive updates on CRD water systems and other relevant information within the CRD, residents are reminded to subscribe to the latest news on our website at **cariboord.ca/subscribe**.*

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The Cariboo Regional District has issued a water quality advisory for users of the Forest Grove Water System because of a positive test result for low coliform found in the system.

For this reason, as precautionary measure, any high-risk users, including those with weakened immune systems, young children and those on dialysis are advised to:

- **use purchased bottled water or boiled water for drinking, brushing teeth, dishwashing, preparing food, and making ice, or**
- **bring water to a roiling boil for one minute, then cool to an appropriate temperature before using.**

The CRD regularly tests the water system as part of its Water Quality Monitoring Program. The advisory will remain in effect until further notice. We apologize in advance for any inconvenience this may cause.

When satisfactory results are reported from the required testing, customers will be notified that the advisory has been lifted. If you have questions, please call the Environmental Services department at 1-800-665-1636. If calling outside of regular business hours (8:30 a.m. to 4:30 p.m. Monday to Friday), please dial "5" when prompted to reach our emergency after hours contact.

For more information about boil water advisories and service interruptions in the CRD and what to expect, visit cariboord.ca/water-notices-and-advisories.

To receive updates on CRD water systems and other relevant information within the CRD, residents are reminded to subscribe to the latest news on our website at cariboord.ca/subscribe.

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