REGIONAL DISTRICT OF NANAIMO

Water Service Area Annual Report 2022

Rivers Edge (Englishman River) Water Service Area

June 2023

REGIONAL DISTRICT OF NANAIMO
Water Services Department
6300 Hammond Bay Rd, Nanaimo, BC Canada V9T 6N2 | Ph 250-390-6560

Table of Contents

1.0 Introduction

The following annual report describes the Rivers Edge Community Water Service Area (also previously known as the Englishman River Community Water Service Area) and summarizes the water quality and production data from 2022. This report also includes a summary of inquiries and complaints, completed and proposed maintenance activities, Operator Certification, the Emergency Response & Contingency Plan, and the Cross Connection Control Program.

This report is to be submitted to Island Health by the spring of 2023.

2.0 Rivers Edge Water Service Area

The Rivers Edge Community Water Service Area was established in 2003 and is comprised of the Rivers Edge residential subdivision near the southern boundary of the City of Parksville. The water source for the Englishman River Community Water Service Area comes from a series of groundwater wells located within the neighbourhood. The water source is chlorinated and stored in one reservoir. There are 152 water service connections in the Englishman River Water Service Area. A generator is available for emergency power outages. A map of the Englishman River Water Service Area is provided in Appendix A for reference. In 2021 the name of the service area was officially changed from Englishman River to Rivers Edge.

2.1 Groundwater Wells

Groundwater production wells ER #2 and ER #3 are located at 2231 Rascal Lane, Parksville, B.C. Test well PW #1 is located on Peterson Road, and was converted to a monitoring well in 2005. Test Well PW #4 is located on Rivers Edge Drive and was converted to a provincial monitoring well in 2012.

Well / Name	Well Depth	In Use	Wellhead Protection	Treated/Untreated with Chlorine
ER #2	29.3 m	Yes	Yes	Treated
ER #3	32.6 m	Yes	Yes	Treated

2.2 Reservoirs

One dual-chambered concrete service reservoir is present at 890 Stonefly Close and has a capacity of 795 m^3 (175,000 imperial gallons).

2.3 Distribution System

The water distribution system is summarized in the table below. Fire hydrants (24) are located throughout the system.

Watermain Material	Length of mains in service area	Prevalence in Water Service Area
Asbestos-concrete	none	n/a
PVC: 150mm or smaller	3.6 km	28.8%
200mm or larger	8.9 km	71.2%

Note: 'PVC' is poly-vinylchloride (plastic)

3.0 Water Sampling and Testing Program

Water sampling and testing is carried out weekly in the distribution system. Notably, the chlorine residual levels are tested weekly to ensure the absence of bacterial regrowth in the watermains. The following table includes a summary of all testing:

Timing	Location	Tests
Weekly	RDN (in-house) Laboratory	Total coliforms, E.Coli, Temperature, pH, Conductivity, Chlorine residual, Salinity, TDS
Semi-Monthly	BC Centre for Disease Control	Total coliforms, E.Coli
Quarterly	Bureau Veritas	Total Iron & Total Manganese
Annual Source Water Testing (every Fall)	Bureau Veritas	Complete potability testing of raw well water (including T-Ammonia in 2012)
Annual Water System Testing (every Spring)	Bureau Veritas	Complete potability testing of distribution system (including T-Ammonia in 2012)

4.0 Water Quality - Source Water and Distribution System

Up-to-date water quality reports and lab data are posted monthly on the RDN website at www.rdn.bc.ca/englishman-river. Tables of water quality testing results for both the source water and distribution system are provided at the end of this report under Appendix B.

5.0 Water Quality Inquiries and Complaints

A few complaints and inquiries were received from the Rivers Edge Water Service Area in 2022, and were typically related to irrigation leaks, iron and manganese discolouration, and high water bills.

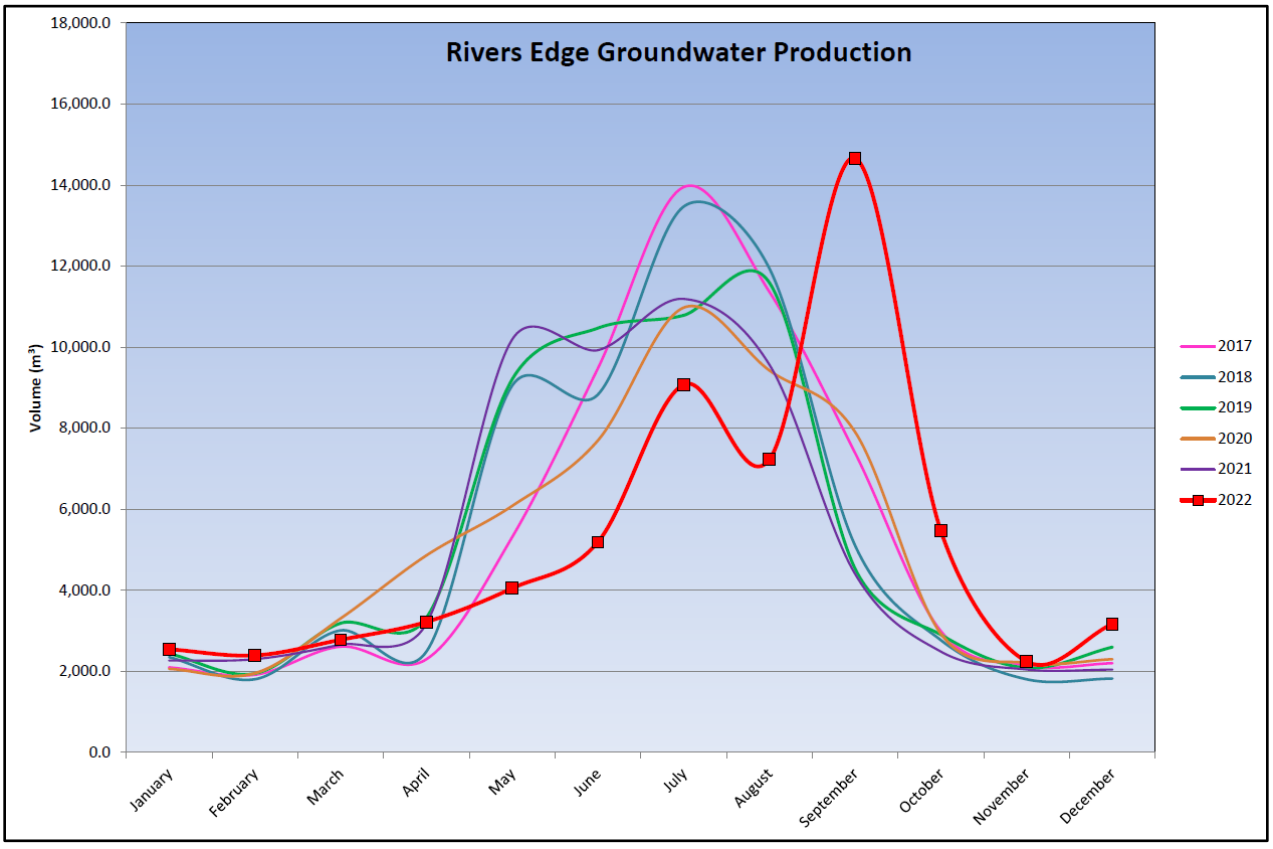
Water Sampling Station in Rivers Edge

A summary of the water system incidents in 2022 is given in the table below.

Activity in 2022	Date(s)	History/Notes
Boil Water Advisories	None	None, ever.
High Turbidity Events	None	None, ever.
Equipment Malfunction	None	None.
Water Main Breaks	None	None.
Pump Failures	None	Temp power outages.

6.0 Groundwater Production and Consumption

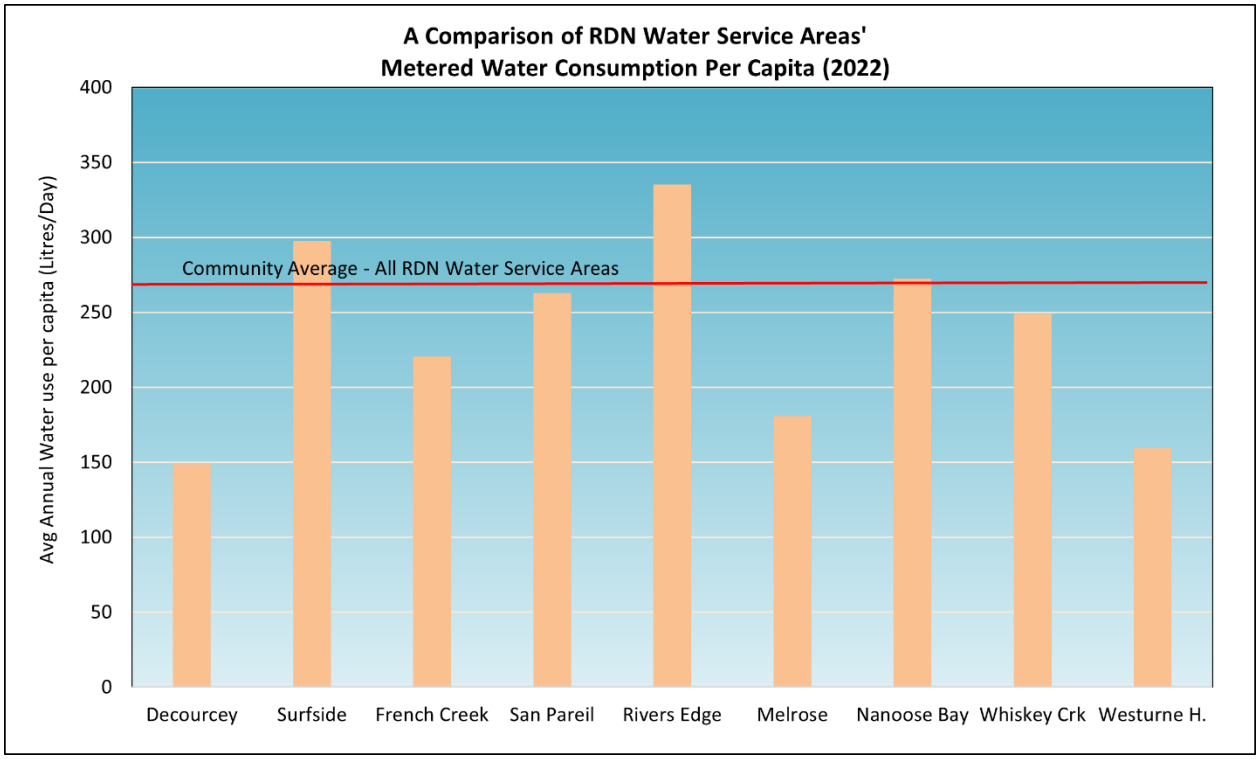
Monthly groundwater production in the Rivers Edge Water Service Area for the past 6 years is shown in the chart below. Water production in 2022 was below average in comparison to the previous years, except for late summer due to higher than normal fall temperatures.



Consumption

In the Fall/Winter of 2022, the average usage per home in the Rivers Edge Water Service Area was 0.56 cubic metres per day (123.2 imperial gallons). In the summer, the average water usage was 1.31 cubic metres per day (288.2 imperial gallons). Based on these figures, the annual consumption per capita is

estimated to be 335 L/day (based on 2.4 people per household). This consumption is ***25% higher*** than the average of all the other RDN water systems of 269 L/day/capita for 2022.



7.0 Maintenance Program

A weekly pump station inspection is carried out to reduce or eliminate the risk of contamination and system failure, and to ensure the consistent application of chlorine for treatment purposes. Watermains are flushed once annually in the spring. Fire hydrants are serviced once per year (either 'A-level' or 'B-level' maintenance). The water storage reservoir is drained and cleaned as required, every 4-5 years. Twenty-four hour on-call coverage is in place to respond to water system emergencies and alarms.

8.0 Operator Certification

The Regional District Water & Utility Services staff is comprised of one Manager, one Project Engineer, one Engineering Technologist, one Engineering Technician, one Chief Operator, and seven certified operators. The operators receive ongoing training and certification in:

- ✓ Water Treatment
- ✓ Water Distribution
- ✓ Wastewater Collection
- ✓ Cross Connection Control
- ✓ Asbestos Awareness
- ✓ Chlorine Handling
- ✓ WHMIS (Workplace Hazardous Material Information System)
- ✓ TDG (Transportation of Dangerous Goods)
- ✓ Confined Space Awareness
- ✓ Fall Protection
- ✓ First Aid
- ✓ Silica Awareness

9.0 Water Service Area Projects

9.1 2022 Completed Studies & Projects

- Design additional well site and transmission main infrastructure;
- Met with residents at River's Edge water supply information community event;
- Corresponded with residents regarding water conservation;
- Utilized leak detection equipment and tracking;
- Set new water rates structure based on rewarding conservation;
- Followed Cross Connection Control program to reduce backflow prevention risks;
- Enforced outdoor sprinkling regulations;
- Advised residents regarding water leak repairs;
- Continued the 2021-2030 Water Conservation Plan;
- Completed regular watermain flushing and hydrant maintenance;
- Maintained a high level of water quality;
- Continued quality control through regular testing and monitoring of water system;
- Implement Phase 2 Water Systems SCADA Master Plan; and
- Continued valve maintenance program.

9.2 2023 Proposed Projects & Upgrades

- Continue well site and transmission main infrastructure upgrade project;
- Clean eastern half of water storage reservoir;
- Complete irrigation checks for high-water users;
- Begin billing for metered consumption based on revised water rates;
- Continue watermain flushing program and hydrant maintenance;
- Continue leak detection equipment utilization program;
- Introduce new watermain flushing and metering procedures to promote conservation;
- Continue valve maintenance program;
- Continue the 2021-2030 DWWP Water Conservation Plan; and
- Continue to offer numerous water-saving incentives via rebates.

Watering Restriction Sign on Kaye Road

10.0 Emergency Response & Contingency Plan

The Regional District Emergency Response & Contingency Plan (ERCP) contains procedures and contact information to efficiently respond to water system emergencies such as contamination of water supply, loss of supply, pump failure, and drought management. The ERCP was reviewed and updated in 2022, and copies are available on our website, at each RDN office, in each pumphouse, and in each Water Services vehicle. A copy of the ERCP is also attached to this report in Appendix C.

11.0 Supply Security

The RDN continues to effectively manage water supply in River's Edge in response to ongoing demand and the effects of climate change. This service area is almost completely built out so growth in demand is not expected. Initiatives to provide adequate long-term supply and resiliency for groundwater remain a high priority. Improvements to groundwater infrastructure are currently being developed to address emergent issues with water quality. Water from backup sources is available to be delivered in the case of an emergency. Groundwater quality is regularly tested in all RDN water service areas. Aquifers within the regional district are monitored through the RDN's Drinking Water and Watershed Protection (DWWP) program. The most sustainable way to protect water supply is through demand management (conservation), which is promoted through outreach and stewardship initiatives provided by the RDN's Team WaterSmart, as well as the RDN Water Service Area's Water Conservation Plan 2020-2030. Rebates for well water testing, water smart landscaping, and rainwater harvesting further assist RDN residents to reduce water usage in high demand seasons. A new tiered system for water rates introduced in 2022 will help promote conservation by rewarding low water users with reduced rates and encouraging high water users to seek ways to use less. Additional planning and preparation initiatives will be introduced in the future to support water supply security.

12.0 Cross Connection Control

The RDN's Cross Connection Control Program was put in place to protect the public health by reducing the risk of contaminants flowing back into the public water supply. The RDN Manager of Water Services is the designated Cross Connection Control Manager.

The RDN's Cross Connection Control Program addresses cross connection threats through operating policies and procedures, as well as assisting customers with backflow preventer selection, installation, testing, maintenance and reporting. The program receives its authority from *RDN Cross Connection Control Regulation Bylaw No. 1788*, and the *British Columbia Building Code, Part 7*, which requires that potable water be protected from contamination. Additionally, a webpage has been established at https://rdn.bc.ca/cross-connection-control-program to educate RDN water service customers about cross connection hazards, and lists the relevant links to current standards and resources.

Two of the RDN's water system operators received certification as backflow assembly testers through the British Columbia Water & Waste Association (BCWWA).

13.0 Cyber Security

The RDN uses a multi-level approach to cyber-security. Corporate network security is employed via a universal threat management gateway that implements various methods of data security, which includes daily definition updates to block known cyber threats. In addition, all RDN PC's are protected with anti-virus software. RDN water systems are connected to the corporate network via IP-Sec VPN's for remote management by information technology and equipment operators. Future infrastructure upgrades will see our water systems located on segregated networks to limit the vulnerability from cybersecurity threats.

14.0 Closing

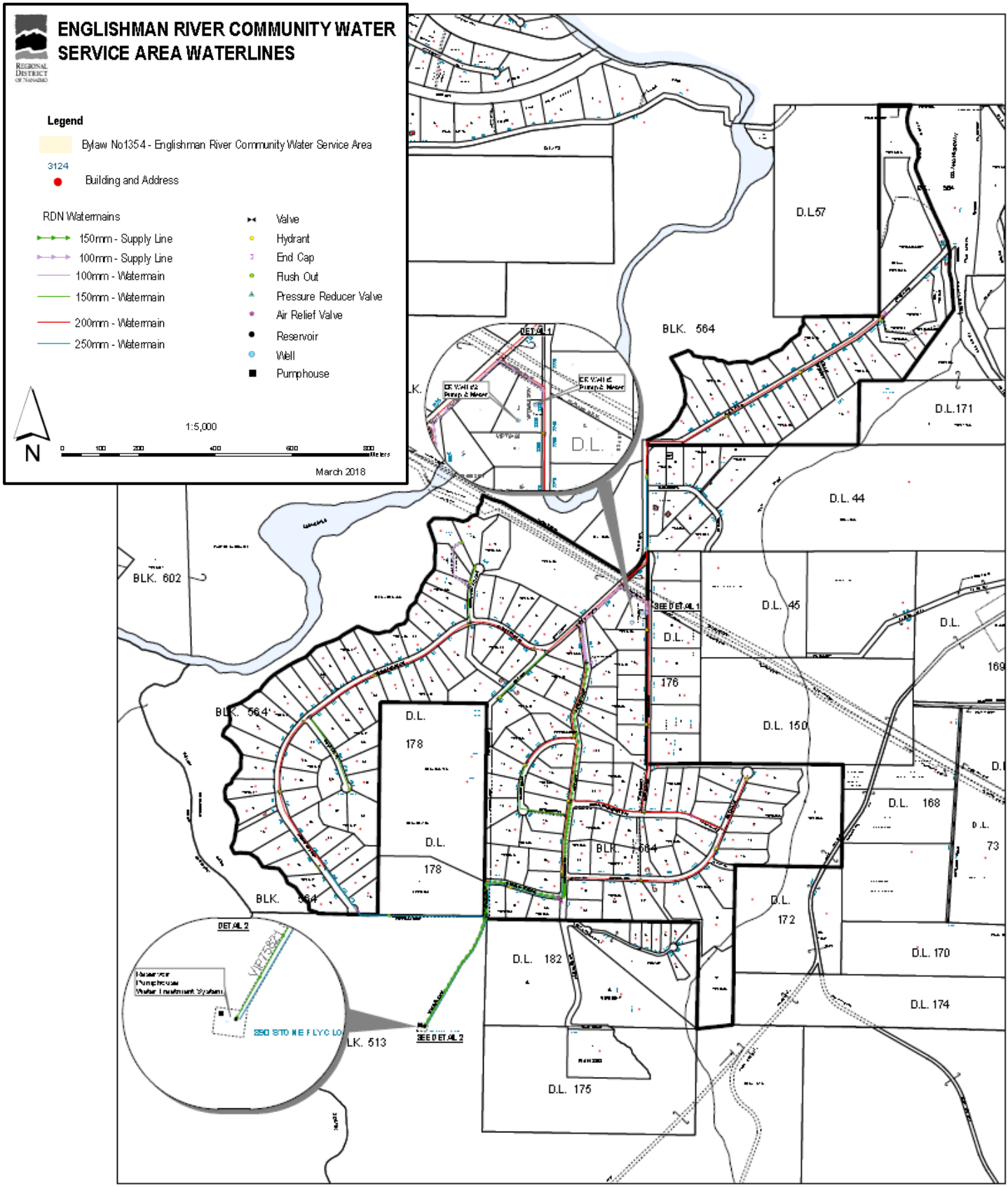
An annual report for the year 2023 will be prepared and submitted to Island Health in the spring of 2024. Annual reports are also available on our website at: www.rdn.bc.ca/englishman-river.

APPENDIX A

MAP OF RIVERS EDGE

WATER SERVICE AREA

RIVERS EDGE WATER SERVICE AREA



APPENDIX B

WATER QUALITY TESTING RESULTS

RIVERS EDGE
COMMUNITY WATER SYSTEM

Facility Location: 1116 Herring Gull Way

Facility Information: Facility Type: 301-10000 (DWT)

Facility Sampling History:

Date Collected	Total Coliform	Total E. Coli	Site Name
01/25/2022	LT1	LT1	Rivers Edge Sample Port - 1969 Kaye Road
02/08/2022	LT1	LT1	Rivers Edge Sample Port - 1969 Kaye Road
04/05/2022	LT1	LT1	Rivers Edge Sample Port - 1969 Kaye Road
05/03/2022	LT1	LT1	Rivers Edge Sample Port - 1969 Kaye Road
06/08/2022	LT1	LT1	Rivers Edge Sample Port - 1969 Kaye Road
07/06/2022	LT1	LT1	Rivers Edge Sample Port - 1969 Kaye Road
08/02/2022	LT1	LT1	Rivers Edge Sample Port - 1969 Kaye Road
08/10/2022	LT1	LT1	Rivers Edge Sample Port - 1969 Kaye Road
09/06/2022	LT1	LT1	Rivers Edge Sample Port - 1969 Kaye Road
10/03/2022	LT1	LT1	Rivers Edge Sample Port - 1969 Kaye Road
11/02/2022	LT1	LT1	Rivers Edge Sample Port - 1969 Kaye Road
12/07/2022	LT1	LT1	Rivers Edge Sample Port - 1969 Kaye Road
01/05/2022	QRWRT	QRWRT	Rivers Edge Sample Port - 2235 Rascal Lane
01/19/2022	LT1	LT1	Rivers Edge Sample Port - 2235 Rascal Lane
02/01/2022	LT1	LT1	Rivers Edge Sample Port - 2235 Rascal Lane
03/01/2022	LT1	LT1	Rivers Edge Sample Port - 2235 Rascal Lane
03/08/2022	LT1	LT1	Rivers Edge Sample Port - 2235 Rascal Lane
04/19/2022	LT1	LT1	Rivers Edge Sample Port - 2235 Rascal Lane
05/17/2022	LT1	LT1	Rivers Edge Sample Port - 2235 Rascal Lane
05/31/2022	LT1	LT1	Rivers Edge Sample Port - 2235 Rascal Lane
06/13/2022	LT1	LT1	Rivers Edge Sample Port - 2235 Rascal Lane
07/13/2022	LT1	LT1	Rivers Edge Sample Port - 2235 Rascal Lane
09/14/2022	LT1	LT1	Rivers Edge Sample Port - 2235 Rascal Lane
10/12/2022	LT1	LT1	Rivers Edge Sample Port - 2235 Rascal Lane
11/07/2022	LT1	LT1	Rivers Edge Sample Port - 2235 Rascal Lane
12/19/2022	QRWRT	QRWRT	Rivers Edge Sample Port - 2235 Rascal Lane

Interpreting Sample Reports

In VIHA, the results of drinking water sampling are reported using the following coding system:

LT1 Less than 1 (no detectable bacteria) – Meaning: No bacteria present

L1 Less than 1 (no detectable bacteria) - Meaning: No bacteria present

Regional District of Nanaimo - Water Services Department

River's Edge Water Analysis - 2022 Monthly Report

		BC Centre for Disease Control		RDN In-House Laboratory & Spectrophotometer								Bureau Veritas Lab	
Date	Sample Location (Address)	E. coli *	Total Coliform *	E.coli *	Total Coliform *	Temp. (°C)	pH	Free Chlorine Residual (mg/L)	Total Dissolved Solids (mg/L)	Salinity (%)	Conductivity (µS/cm)	Total Iron (mg/L)	Manganese (mg/L)
5-Dec-22	1969 Kaye			0	0	8	7.04	0.50	251.0	0.27	540.0		
7-Dec-22	1969 Kaye	0	0	0	0	7	6.99	0.52	268.0	0.27	554.0	0.0151	0.0112
14-Dec-22	2235 Rascal			0	0	7	7.10	0.52	249.0	0.27	549.0	0.0383	0.0118
19-Dec-22	2235 Rascal	0	0	0	0	7	7.46	0.58	271.0	0.27	558.0		
CDN Drinking Water Guidelines		<1	<1	<1	<1	n/a	7.0-10.5	n/a	500	n/a	n/a	0.3	**0.02** AO **0.12** MAC

Legend:

*** Coliforms are measured in colony forming units (CFU) per 100 millilitres of water (CFU/100mL)**

Green font indicates a value flagged for operational consideration

Orange font indicates non-compliance with the Aesthetic Objective (AO) in the Canadian Drinking Water Guidelines (CDWG)

Red font indicates non-compliance with the Maximum Acceptable Concentration (MAC) in the CDWG

Comments:

Notes below about pH (2015) from https://www.canada.ca/en/health-canada/services/environmental-workplace-health/reports-publications/water-quality/guidelines-canadian-drinking-water-quality-summary-table.html#_ftn1

Type	Parameter (published, reaffirmed)	MAC (mg/L)	Other value (mg/L)	Common sources of parameter in water	Health considerations	Comments
Treatment-related	pH (2015)	None	7.0-10.5	Not applicable	Not applicable	The control of pH is important to maximize treatment effectiveness, control corrosion and reduce leaching from distribution system and plumbing components.

Regional District of Nanaimo - Water Services Department

River's Edge Water Analysis - 2022 Monthly Report

		BC Centre for Disease Control		RDN In-House Laboratory & Spectrophotometer								Bureau Veritas Lab	
Date	Sample Location (Address)	E. coli *	Total Coliform *	E.coli *	Total Coliform *	Temp. (°C)	pH	Free Chlorine Residual (mg/L)	Total Dissolved Solids (mg/L)	Salinity (%)	Conductivity (µS/cm)	Total Iron (mg/L)	Manganese (mg/L)
3-Nov-22	1969 Kaye	0	0	0	0	12	7.16	0.44	279.0	0.28	575.0		
7-Nov-22	2235 Rascal	0	0	0	0	11	7.01	0.31	277.0	0.28	570.0		
16-Nov-22	1969 Kaye Rd			0	0	10	6.83	0.43	271.0	0.27	559.0		
22-Nov-22	2235 Rascal			0	0	10	7.06	0.40	274.0	0.27	564.0		
28-Nov-22	1969 Kaye			0	0	9	6.99	0.56	266.0	0.26	567.0		
CDN Drinking Water Guidelines		<1	<1	<1	<1	n/a	7.0-10.5	n/a	500	n/a	n/a	0.3	0.02 AO 0.12 MAC

Legend:

*** Coliforms are measured in colony forming units (CFU) per 100 millilitres of water (CFU/100mL)**

Green font indicates a value flagged for operational consideration

Orange font indicates non-compliance with the Aesthetic Objective (AO) in the Canadian Drinking Water Guidelines (CDWG)

Red font indicates non-compliance with the Maximum Acceptable Concentration (MAC) in the CDWG

Comments:

Notes below about pH (2015) from https://www.canada.ca/en/health-canada/services/environmental-workplace-health/reports-publications/water-quality/guidelines-canadian-drinking-water-quality-summary-table.html#_ftn1

Type	Parameter (published, reaffirmed)	MAC (mg/L)	Other value (mg/L)	Common sources of parameter in water	Health considerations	Comments
Treatment-related	pH (2015)	None	7.0-10.5	Not applicable	Not applicable	The control of pH is important to maximize treatment effectiveness, control corrosion and reduce leaching from distribution system and plumbing components.

Regional District of Nanaimo - Water Services Department

River's Edge Water Analysis - 2022 Monthly Report

		BC Centre for Disease Control		RDN In-House Laboratory & Spectrophotometer								Bureau Veritas Lab	
Date	Sample Location (Address)	E. coli *	Total Coliform *	E.coli *	Total Coliform *	Temp. (°C)	pH	Free Chlorine Residual (mg/L)	Total Dissolved Solids (mg/L)	Salinity (%)	Conductivity (µS/cm)	Total Iron (mg/L)	Manganese (mg/L)
3-Oct-22	1969 Kaye	0	0	0	0	14	7.12	0.53	270.0	0.27	539.0		
12-Oct-22	2235 Rascal	0	0	0	0	14	6.99	0.38	282.0	0.28	581.0		
17-Oct-22	1969 Kaye			0	0	14	6.89	0.40	278.0	0.28	573.0		
24-Oct-22	2235 Rascal			0	0	15	7.28	0.53	278.0	0.28	572.0		
CDN Drinking Water Guidelines		<1	<1	<1	<1	n/a	7.0-10.5	n/a	500	n/a	n/a	0.3	0.02 AO 0.12 MAC

Legend:

*** Coliforms are measured in colony forming units (CFU) per 100 millilitres of water (CFU/100mL)**

Green font indicates a value flagged for operational consideration

Orange font indicates non-compliance with the Aesthetic Objective (AO) in the Canadian Drinking Water Guidelines (CDWG)

Red font indicates non-compliance with the Maximum Acceptable Concentration (MAC) in the CDWG

Comments:

Notes below about pH (2015) from https://www.canada.ca/en/health-canada/services/environmental-workplace-health/reports-publications/water-quality/guidelines-canadian-drinking-water-quality-summary-table.html#_ftn1

Type	Parameter (published, reaffirmed)	MAC (mg/L)	Other value (mg/L)	Common sources of parameter in water	Health considerations	Comments
Treatment-related	pH (2015)	None	7.0-10.5	Not applicable	Not applicable	The control of pH is important to maximize treatment effectiveness, control corrosion and reduce leaching from distribution system and plumbing components.

Regional District of Nanaimo - Water Services Department

River's Edge Water Analysis - 2022 Monthly Report

		BC Centre for Disease Control		RDN In-House Laboratory & Spectrophotometer								Bureau Veritas Lab	
Date	Sample Location (Address)	E. coli *	Total Coliform *	E.coli *	Total Coliform *	Temp. (°C)	pH	Free Chlorine Residual (mg/L)	Total Dissolved Solids (mg/L)	Salinity (%)	Conductivity (µS/cm)	Total Iron (mg/L)	Manganese (mg/L)
6-Sep-22	1969 Kaye	0	0	0	0	16	7.50	0.75	276.0	0.28	570.0		
14-Sep-22	2235 Rascal	0	0	0	0	16	7.69	0.72	282.0	0.28	580.0		
20-Sep-22	1969 Kaye			0	0	16	7.60	0.30	279.0	0.28	574.0		
26-Sep-22	2235 Rascal			0	0		7.10	0.17	279.0	0.28	572.0		
CDN Drinking Water Guidelines		<1	<1	<1	<1	n/a	7.0-10.5	n/a	500	n/a	n/a	0.3	**0.02** AO **0.12** MAC

Legend:

*** Coliforms are measured in colony forming units (CFU) per 100 millilitres of water (CFU/100mL)**

Green font indicates a value flagged for operational consideration

Orange font indicates non-compliance with the Aesthetic Objective (AO) in the Canadian Drinking Water Guidelines (CDWG)

Red font indicates non-compliance with the Maximum Acceptable Concentration (MAC) in the CDWG

Comments:

Regional District of Nanaimo - Water Services Department

River's Edge Water Analysis - 2022 Monthly Report

		BC Centre for Disease Control		RDN In-House Laboratory & Spectrophotometer								Bureau Veritas Lab	
Date	Sample Location (Address)	E. coli *	Total Coliform *	E.coli *	Total Coliform *	Temp. (°C)	pH	Free Chlorine Residual (mg/L)	Total Dissolved Solids (mg/L)	Salinity (%)	Conductivity (µS/cm)	Total Iron (mg/L)	Manganese (mg/L)
2-Aug-22	1969 Kaye	0	0	0	0	n/a	7.53	0.67	270.0	0.27	555.0		
10-Aug-02	1969 Kaye	0	0	0	0	15	7.25	0.58	274.0	0.27	565.0		
16-Aug-22	1969 Kaye			0	0	16	7.15	0.65	276.0	0.27	569.0		
24-Aug-22	2235 Rascal			0	0	15	7.60	0.68	276.0	0.28	568.0		
CDN Drinking Water Guidelines		<1	<1	<1	<1	n/a	7.0-10.5	n/a	500	n/a	n/a	0.3	0.02 AO 0.12 MAC

Legend:

* Coliforms are measured in colony forming units (CFU) per 100 millilitres of water (CFU/100mL)

Green font indicates a value flagged for operational consideration

Orange font indicates non-compliance with the Aesthetic Objective (AO) in the Canadian Drinking Water Guidelines (CDWG)

Red font indicates non-compliance with the Maximum Acceptable Concentration (MAC) in the CDWG

Comments:

Regional District of Nanaimo - Water Services Department

River's Edge Water Analysis - 2022 Monthly Report

		BC Centre for Disease Control		RDN In-House Laboratory & Spectrophotometer								Bureau Veritas Lab	
Date	Sample Location (Address)	E. coli *	Total Coliform *	E.coli *	Total Coliform *	Temp. (°C)	pH	Free Chlorine Residual (mg/L)	Total Dissolved Solids (mg/L)	Salinity (%)	Conductivity (µS/cm)	Total Iron (mg/L)	Manganese (mg/L)
6-Jul-22	1969 Kaye	0	0	0	0	15	7.92	0.59	271.0	0.27	559.0		
13-Jul-22	2235 Rascal	0	0	0	0	15	7.43	0.58	273.0	0.27	563.0		
20-Jul-22	1969 Kaye			0	0	16	7.30	0.34	266.0	0.25	509.0		
25-Jul-22	2235 Rascal			0	0	15	7.08	0.62	274.0	0.27	565.0		
CDN Drinking Water Guidelines		<1	<1	<1	<1	n/a	7.0-10.5	n/a	500	n/a	n/a	0.3	0.02 AO 0.12 MAC

Legend:

* Coliforms are measured in colony forming units (CFU) per 100 millilitres of water (CFU/100mL)

Green font indicates a value flagged for operational consideration

Orange font indicates non-compliance with the Aesthetic Objective (AO) in the Canadian Drinking Water Guidelines (CDWG)

Red font indicates non-compliance with the Maximum Acceptable Concentration (MAC) in the CDWG

Comments:

Regional District of Nanaimo - Water Services Department

River's Edge Water Analysis - 2022 Monthly Report

		BC Centre for Disease Control		RDN In-House Laboratory & Spectrophotometer								Bureau Veritas Lab	
Date	Sample Location (Address)	E. coli *	Total Coliform *	E.coli *	Total Coliform *	Temp. (°C)	pH	Free Chlorine Residual (mg/L)	Total Dissolved Solids (mg/L)	Salinity (%)	Conductivity (µS/cm)	Total Iron (mg/L)	Manganese (mg/L)
8-Jun-22	1969 Kaye	0	0	0	0	13	7.08	0.68	268.0	0.27	553.0	0.019	0.0137
13-Jun-22	2235 Rascal	0	0	0	0	12	7.63	0.55	267.0	0.27	551.0		
20-Jun-22	2235 Rascal			0	0	13	7.24	0.61	266.0	0.26	548.0	0.012	0.0081
29-Jun-22	2235 Rascal			0	0	15	7.11	0.63	270.0	0.27	557.0		
CDN Drinking Water Guidelines		<1	<1	<1	<1	n/a	7.0-10.5	n/a	500	n/a	n/a	0.3	0.02 AO 0.12 MAC

Legend:

* Coliforms are measured in colony forming units (CFU) per 100 millilitres of water (CFU/100mL)

Green font indicates a value flagged for operational consideration

Orange font indicates non-compliance with the Aesthetic Objective (AO) in the Canadian Drinking Water Guidelines (CDWG)

Red font indicates non-compliance with the Maximum Acceptable Concentration (MAC) in the CDWG

Comments:

Regional District of Nanaimo - Water Services Department

River's Edge Water Analysis - 2022 Monthly Report

		BC Centre for Disease Control		RDN In-House Laboratory & Spectrophotometer								Bureau Veritas Lab	
Date	Sample Location (Address)	E. coli *	Total Coliform *	E.coli *	Total Coliform *	Temp. (°C)	pH	Free Chlorine Residual (mg/L)	Total Dissolved Solids (mg/L)	Salinity (%)	Conductivity (µS/cm)	Total Iron (mg/L)	Manganese (mg/L)
3-May-22	1969 Kaye			0	0	9	7.00	0.66	261.0	0.25	544.0		
9-May-22	2235 Rascal			0	0	10	7.29	0.59	250.0	0.25	529.0		
17-May-22	2235 Rascal	0	0	0	0	10	7.22	0.61	262.0	0.26	511.0		
25-May-22	1969 Kaye			0	0	10	7.90	0.58	283.0	0.28	583.0		
31-May-22	2235 Rascal	0	0	0	0	11	7.09	0.62	263.0	0.26	541.0		
CDN Drinking Water Guidelines		<1	<1	<1	<1	n/a	7.0-10.5	n/a	500	n/a	n/a	0.3	0.02 AO 0.12 MAC

Legend:

* Coliforms are measured in colony forming units (CFU) per 100 millilitres of water (CFU/100mL)

Green font indicates a value flagged for operational consideration

Orange font indicates non-compliance with the Aesthetic Objective (AO) in the Canadian Drinking Water Guidelines (CDWG)

Red font indicates non-compliance with the Maximum Acceptable Concentration (MAC) in the CDWG

Comments:

Regional District of Nanaimo - Water Services Department

River's Edge Water Analysis - 2022 Monthly Report

		BC Centre for Disease Control		RDN In-House Laboratory & Spectrophotometer								Bureau Veritas Lab	
Date	Sample Location (Address)	E. coli *	Total Coliform *	E.coli *	Total Coliform *	Temp. (°C)	pH	Free Chlorine Residual (mg/L)	Total Dissolved Solids (mg/L)	Salinity (%)	Conductivity (µS/cm)	Total Iron (mg/L)	Manganese (mg/L)
5-Apr-22	1969 Kaye	0	0	0	0	8	7.80	0.59	262.0	0.26	541.0		
13-Apr-22	2235 Rascal			0	0	8	7.23	0.49	266.0	0.26	555.0		
19-Apr-22	2235 Rascal	0	0	0	0	9	7.30	0.66	259.0	0.26	549.0		
27-Apr-22	1969 Kaye			0	0	8	6.96	0.71	259.0	0.26	535.0		
CDN Drinking Water Guidelines		<1	<1	<1	<1	n/a	7.0-10.5	n/a	500	n/a	n/a	0.3	**0.02** AO **0.12** MAC

Legend:

*** Coliforms are measured in colony forming units (CFU) per 100 millilitres of water (CFU/100mL)**

Green font indicates a value flagged for operational consideration

Orange font indicates non-compliance with the Aesthetic Objective (AO) in the Canadian Drinking Water Guidelines (CDWG)

Red font indicates non-compliance with the Maximum Acceptable Concentration (MAC) in the CDWG

Comments:

Notes below about pH (2015) from https://www.canada.ca/en/health-canada/services/environmental-workplace-health/reports-publications/water-quality/guidelines-canadian-drinking-water-quality-summary-table.html#_ftn1

Type	Parameter (published, reaffirmed)	MAC (mg/L)	Other value (mg/L)	Common sources of parameter in water	Health considerations	Comments
Treatment-related	pH (2015)	None	7.0-10.5	Not applicable	Not applicable	The control of pH is important to maximize treatment effectiveness, control corrosion and reduce leaching from distribution system and plumbing components.

Regional District of Nanaimo - Water Services Department

River's Edge Water Analysis - 2022 Monthly Report

		BC Centre for Disease Control		RDN In-House Laboratory & Spectrophotometer								Bureau Veritas Lab	
Date	Sample Location (Address)	E. coli *	Total Coliform *	E.coli *	Total Coliform *	Temp. (°C)	pH	Free Chlorine Residual (mg/L)	Total Dissolved Solids (mg/L)	Salinity (%)	Conductivity (µS/cm)	Total Iron (mg/L)	Manganese (mg/L)
1-Mar-22	2235 Rascal	0	0	0	0	7	7.19	0.69	251.0	0.25	539.0		
8-Mar-22	2235 Rascal	0	0	0	0	6	6.88	0.70	263.0	0.26	542.0		
16-Mar-22	1969 Kaye			0	0	8	7.54	0.61	255.0	0.25	529.0	0.0182	0.008
23-Mar-22	2235 Rascal			0	0	8	7.55	0.75	261.0	0.26	541.0	0.0171	0.013
29-Mar-22	1969 Kaye			0	0	8	7.13	0.62	268.0	0.27	552.0		
CDN Drinking Water Guidelines		<1	<1	<1	<1	n/a	7.0-10.5	n/a	500	n/a	n/a	0.3	**0.02** AO **0.12** MAC

Legend:

*** Coliforms are measured in colony forming units (CFU) per 100 millilitres of water (CFU/100mL)**

Green font indicates a value flagged for operational consideration

Orange font indicates non-compliance with the Aesthetic Objective (AO) in the Canadian Drinking Water Guidelines (CDWG)

Red font indicates non-compliance with the Maximum Acceptable Concentration (MAC) in the CDWG

Comments:

Notes below about pH (2015) from https://www.canada.ca/en/health-canada/services/environmental-workplace-health/reports-publications/water-quality/guidelines-canadian-drinking-water-quality-summary-table.html#_ftn1

Type	Parameter (published, reaffirmed)	MAC (mg/L)	Other value (mg/L)	Common sources of parameter in water	Health considerations	Comments
Treatment-related	pH (2015)	None	7.0-10.5	Not applicable	Not applicable	The control of pH is important to maximize treatment effectiveness, control corrosion and reduce leaching from distribution system and plumbing components.

Regional District of Nanaimo - Water Services Department

River's Edge Water Analysis - 2022 Monthly Report

		BC Centre for Disease Control		RDN In-House Laboratory & Spectrophotometer								Bureau Veritas Lab	
Date	Sample Location (Address)	E. coli *	Total Coliform *	E.coli *	Total Coliform *	Temp. (°C)	pH	Free Chlorine Residual (mg/L)	Total Dissolved Solids (mg/L)	Salinity (%)	Conductivity (µS/cm)	Total Iron (mg/L)	Manganese (mg/L)
01-Feb-22	2235 Rascal	0	0	0	0	6	7.2	0.66	260	0.25	544		
8-Feb-22	1969 Kaye	0	0	0	0	6	7.12	0.79	264.0	0.26	546.0		
14-Feb-22	2235 Rascal			0	0	7	7.09	0.55	259.0	0.26	513.0		
23-Feb-22	1969 Kaye			0	0	7	7.54	0.71	263.0	0.26	542.0		
24-Feb-22	1969 Kaye (Resample)			0	0	n/a	n/a	n/a	n/a	n/a	n/a		
CDN Drinking Water Guidelines		<1	<1	<1	<1	n/a	7.0-10.5	n/a	500	n/a	n/a	0.3	0.02 AO 0.12 MAC

Legend:

* Coliforms are measured in colony forming units (CFU) per 100 millilitres of water (CFU/100mL)

Green font indicates a value flagged for operational consideration

Orange font indicates non-compliance with the Aesthetic Objective (AO) in the Canadian Drinking Water Guidelines (CDWG)

Red font indicates non-compliance with the Maximum Acceptable Concentration (MAC) in the CDWG

Comments:

Regional District of Nanaimo - Water Services Department

River's Edge Water Analysis - 2022 Monthly Report

		BC Centre for Disease Control		RDN In-House Laboratory & Spectrophotometer								Bureau Veritas Lab	
Date	Sample Location (Address)	E. coli *	Total Coliform *	E.coli *	Total Coliform *	Temp. (°C)	pH	Free Chlorine Residual (mg/L)	Total Dissolved Solids (mg/L)	Salinity (%)	Conductivity (µS/cm)	Total Iron (mg/L)	Manganese (mg/L)
5-Jan-22	2235 Rascal			0	0	6	7.46	0.86	266.0	0.27	549.0		
12-Jan-22	1969 Kaye			0	0	5	7.41	0.39	261.0	0.26	535.0		
19-Jan-22	2235 Rascal	0	0	0	0	7	7.32	0.72	265.0	0.26	547.0		
25-Jan-22	1969 Kaye	0	0	0	0	6	7.48	0.80	269.0	0.27	556.0		
CDN Drinking Water Guidelines		<1	<1	<1	<1	n/a	7.0-10.5	n/a	500	n/a	n/a	0.3	0.02 AO 0.12 MAC

Legend:

* Coliforms are measured in colony forming units (CFU) per 100 millilitres of water (CFU/100mL)

Green font indicates a value flagged for operational consideration

Orange font indicates non-compliance with the Aesthetic Objective (AO) in the Canadian Drinking Water Guidelines (CDWG)

Red font indicates non-compliance with the Maximum Acceptable Concentration (MAC) in the CDWG

Comments:

REGIONAL DISTRICT OF NANAIMO

Englishman River PW2 Raw Well Water Analysis
2231 Rascal Lane

CDWG=Canadian Drinking Water Guidelines
OG= Operational Guidance Value
MAC=Maximum Acceptable Concentration
AO=Aesthetic Objective

Orange font indicates non-compliance with the Aesthetic Objective (AO) in the Canadian Drinking Water Guidelines (CDWG)

Red font indicates non-compliance with the Maximum Acceptable Concentration (MAC) in the CDWG

	Units	CDWG		October 29 2018	October 17 2019	October 20 2020	July 14 2021	October 14 2021	October 20 2022
Miscellaneous Inorganics									
Fluoride	mg/L	1.5	MAC	0.09	0.085	0.082	0.08	0.089	0.088
Alkalinity (total as CaCO)	mg/L			126	130	130	130	130	120
Anions									
Dissolved Sulphate	mg/L	500	AO	6.8	7.5	8	9.4	9.3	7.4
Dissolved Chloride	mg/L	250	AO	56	67	83	92	82	93
Nitrite	mg/L	1	MAC	<0.0050	<0.005	<0.005	<0.005	<0.005	<0.005
Miscellaneous									
Apparent Colour	Colour Unit			5	5	10	<5	<5	<5
Nutrients									
Total Ammonia	mg/L			0.045	0.13	0.061	0.049	0.049	0.068
Physical Properties									
Conductivity	µS/cm			446	460	510	530	500	580
pH	pH	7.0:10.5	OG	8.17	8	8.2	7.9	8.24	8.11
TDS	mg/L	500	AO	266	270	240	350	330	350
Turbidity	NTU			0.18	<0.1	<0.1	0.19	0.12	<0.1
Microbiological Parameters									
E.coli	MPN/100mL	1	MAC	<1.0	0	0	0	0	0
Total Coliforms	MPN/100mL	1	MAC	<1.0	0	0	0	0	0
Calculated Parameters									
Total Hardness (CaCO)	mg/L			169	168	190	194	188	208
Nitrate	mg/L	10	MAC	<0.020	<0.02	<0.02	<0.02	<0.02	<0.02
Elements									
Total Mercury	mg/L	0.001	MAC	<0.000002	<0.000002	<0.0000019	<0.0000019	<0.0000019	<0.0000019
Total Metals									
Total Aluminum	mg/L	0.1	OG	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003
Total Antimony	mg/L	0.006	MAC	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Total Arsenic	mg/L	0.01	MAC	0.00172	0.00163	0.0017	0.00164	0.0017	0.0017
Total Barium	mg/L	1	MAC	0.0263	0.0269	0.0307	0.0329	0.0306	0.0341
Total Beryllium	mg/L			<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Total Bismuth	mg/L			<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Total Boron	mg/L	5	MAC	<0.050	<0.05	<0.05	<0.05	<0.05	0.056
Total Cadmium	mg/L	0.005	MAC	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001
Total Chromium	mg/L	0.05	MAC	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Total Cobalt	mg/L			<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Total Copper	mg/L	1	AO	0.00137	0.00043	0.0004	0.00699	0.00267	0.00045
Total Iron	mg/L	0.3	AO	0.0247	0.0216	0.0055	0.0544	0.025	0.0087
Total Lead	mg/L	0.01	MAC	0.00037	<0.0002	<0.0002	0.0004	<0.0002	<0.0002
Total Manganese	mg/L	0.02 0.12	AO MAC	**0.0311**	**0.0304**	**0.0339**	**0.0365**	**0.034**	**0.0375**
Total Molybdenum	mg/L			0.0014	0.0012	0.0013	0.0014	0.0014	0.0012
Total Nickel	mg/L			<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Total Selenium	mg/L	0.05	MAC	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Total Silicon	mg/L			6.9	6.5	6.72	5.86	7.03	7.89
Total Silver	mg/L			<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002
Total Strontium	mg/L			0.315	0.317	0.371	0.373	0.382	0.428
Total Thallium	mg/L			<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001
Total Tin	mg/L			<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Total Titanium	mg/L			<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Total Uranium	mg/L	0.02	MAC	0.00032	0.00031	0.00033	0.00032	0.00032	0.00031
Total Vanadium	mg/L			<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Total Zinc	mg/L	5	AO	0.0091	0.0052	<0.005	0.0059	0.0095	<0.005
Total Zirconium	mg/L			<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Total Calcium	mg/L			43.8	43.6	47.9	49	48.1	53.6
Total Magnesium	mg/L			14.4	14.4	17	17.5	16.4	18
Total Potassium	mg/L			1.35	1.36	1.5	1.53	1.5	1.44
Total Sodium	mg/L	200	AO	17.4	18	21.5	22.2	20.8	23.4
Total Sulphur	mg/L			<3.0	<3	<3	<3	<3	<3

Notes below about Manganese (2019) from: https://www.canada.ca/en/health-canada/services/environmental-workplace-health/reports-publications/water-quality/guidelines-canadian-drinking-water-quality-summary-table.html

Type	Parameter (published, reaffirmed)	MAC (mg/L)	Other value (mg/L)	Common sources of parameter in water	Health considerations	Comments
I = Inorganic chemical parameter	Manganese (2019)	0.12	AO: <0.02	Dissolution of naturally-occurring minerals commonly found in soil and rock. Other sources include industrial discharge, mining activities and leaching from landfills.	**Health Basis of MAC:** Effects on neurological development and behaviour; deficits in memory, attention, and motor skills. **Other:** Formula-fed infants (where water containing manganese at levels above the MAC is used to prepare formula) may be especially at risk.	AO based on minimizing the occurrence of discoloured water, consumer complaints and staining of laundry.

REGIONAL DISTRICT OF NANAIMO

Englishman River PW3 Raw Well Water Analysis
2231 Rascal Lane

CDWG=Canadian Drinking Water Guidelines
MAC=Maximum Acceptable Concentration
OG= Operational Guidance Value
AO=Aesthetic Objective

Orange font indicates non-compliance with the Aesthetic Objective (AO) in the Canadian Drinking Water Guidelines (CDWG)

Red font indicates non-compliance with the Maximum Acceptable Concentration (MAC) in the CDWG

	Units	CDWG		October 29 2018	October 17 2019	October 20 2020	July 14 2021	October 14 2021	October 20 2022
Miscellaneous Inorganics									
Fluoride	mg/L	1.5	MAC	0.094	0.084	0.086	0.087	0.091	0.095
Alkalinity (total as CaCO)	mg/L			129	130	130	130	140	130
Anions									
Dissolved Sulphate	mg/L	500	AO	7.5	8.1	8.5	10	9	7.6
Dissolved Chloride	mg/L	250	AO	85	98	99	100	100	92
Nitrite	mg/L	1	MAC	<0.0050	<0.005	<0.005	<0.005	<0.005	<0.005
Miscellaneous									
Apparent Colour	Colour Unit			5	10	10	<5	<5	<5
Nutrients									
Total Ammonia	mg/L			0.058	0.13	0.069	0.058	0.05	0.065
Physical Properties									
Conductivity	µS/cm			554	570	570	550	580	580
pH	pH	7.0:10.5	OG	8.16	7.96	8.21	7.97	8.29	8.13
TDS	mg/L	500	AO	326	330	330	340	370	280
Turbidity	NTU			0.35	0.41	0.13	0.21	1.1	0.1
Microbiological Parameters									
E.coli	MPN/100mL	<1	MAC	<1.0	0	0	0	0	0
Total Coliforms	MPN/100mL	<1	MAC	<1.0	0	0	0	0	0
Calculated Parameters									
Total Hardness (CaCO)	mg/L			182	186	197	180	193	195
Nitrate	mg/L	10	MAC	<0.020	<0.02	<0.02	<0.02	<0.02	<0.02
Elements									
Total Mercury	mg/L	0.001	MAC	<0.000002	<0.000002	<0.0000019	<0.0000019	<0.0000019	0.0000034
Total Metals									
Total Aluminum	mg/L	0.1	OG	<0.003	<0.03	<0.003	<0.003	<0.003	<0.003
Total Antimony	mg/L	0.006	MAC	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Total Arsenic	mg/L	0.01	MAC	0.00146	0.00148	0.00154	0.00151	0.00162	0.00168
Total Barium	mg/L	1	MAC	0.032	0.0331	0.034	0.034	0.0353	0.0351
Total Beryllium	mg/L			<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Total Bismuth	mg/L			<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Total Boron	mg/L	5	MAC	0.068	0.075	0.08	0.073	0.081	0.095
Total Cadmium	mg/L	0.005	MAC	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001
Total Chromium	mg/L	0.05	MAC	<0.001	0.0018	<0.001	<0.001	<0.001	<0.001
Total Cobalt	mg/L			<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Total Copper	mg/L	1	AO	0.00175	0.00065	0.00048	0.00324	0.00358	0.00061
Total Iron	mg/L	0.3	AO	0.0477	0.0541	0.0286	0.0492	0.101	0.0284
Total Lead	mg/L	0.01	MAC	0.00031	<0.0002	<0.0002	<0.0002	0.0003	<0.0002
Total Manganese	mg/L	0.02 0.12	AO MAC	**0.0481**	**0.0475**	**0.0452**	**0.0456**	**0.0467**	**0.0473**
Total Molybdenum	mg/L			<0.001	<0.001	<0.001	<0.001	0.001	0.001
Total Nickel	mg/L			<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Total Selenium	mg/L	0.05	MAC	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Total Silicon	mg/L			6.97	6.83	7.57	6.1	7.38	8.37
Total Silver	mg/L			<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002
Total Strontium	mg/L			0.357	0.377	0.388	0.365	0.426	0.428
Total Thallium	mg/L			<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001
Total Tin	mg/L			<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Total Titanium	mg/L			<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Total Uranium	mg/L	0.02	MAC	0.00034	0.00035	0.00035	0.000034	0.00034	0.00034
Total Vanadium	mg/L			<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Total Zinc	mg/L	5	AO	0.0123	0.0174	<0.005	<0.005	0.0258	<0.005
Total Zirconium	mg/L			<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Total Calcium	mg/L			47.6	49.2	52.4	46.1	50.5	51.4
Total Magnesium	mg/L			15.4	15.3	16.1	15.7	16.2	16.3
Total Potassium	mg/L			1.48	1.47	1.53	1.53	1.54	1.48
Total Sodium	mg/L	200	AO	27.3	29.6	31.9	32.1	31.7	33.8
Total Sulphur	mg/L			3.1	<3	<3	<3	<3	<3

Notes below about Manganese (2019) from: https://www.canada.ca/en/health-canada/services/environmental-workplace-health/reports-publications/water-quality/guidelines-canadian-drinking-water-quality-summary-table.html

Type	Parameter (published, reaffirmed)	MAC (mg/L)	Other value (mg/L)	Common sources of parameter in water	Health considerations	Comments
I = Inorganic chemical parameter	Manganese (2019)	0.12	AO: <0.02	Dissolution of naturally-occurring minerals commonly found in soil and rock. Other sources include industrial discharge, mining activities and leaching from landfills.	**Health Basis of MAC:** Effects on neurological development and behaviour; deficits in memory, attention, and motor skills. **Other:** Formula-fed infants (where water containing manganese at levels above the MAC is used to prepare formula) may be especially at risk.	AO based on minimizing the occurrence of discoloured water, consumer complaints and staining of laundry.

REGIONAL DISTRICT OF NANAIMO

Englishman River Distribution (Tap Water) Analysis
1969 Kaye Road

CDWG=Canadian Drinking Water Guidelines AO= Aesthetic Objective

OG= Operational Guidance Value MAC= Maximum Acceptable Concentration in the CDWG

Red font indicates non-compliance with Canadian Drinking Water Guidelines

	Units	CDWG		May 10 2016	May 8 2017	May 7 2018	May 15 2019	May 21 2020	May 6 2021	May 5 2022
Miscellaneous Inorganics										
Fluoride	mg/L	1.5	MAC	0.087	0.096	0.09	0.087	0.095	0.075	<0.05
Alkalinity (total as $CaCO_3$)	mg/L			133	134	124	128	120	130	120
Anions										
Dissolved Sulphate	mg/L	500	AO	7.98	8.52	9.6	8.7	8.3	8.8	1.1
Dissolved Chloride	mg/L	250	AO	65	70	79	84	93	98	78
Nitrite	mg/L	1	MAC	<0.0050	<0.0050	<0.0050	<0.005	<0.005	<0.005	<0.005
Miscellaneous										
Apparent Colour	Colour Unit			10	10	10	<2.0	5	10	<5
Nutrients										
Total Ammonia	mg/L			0.0097	0.085	<0.020	<0.015	0.016	<0.015	<0.015
Physical Properties										
Conductivity	µS/cm			483	480	503	539	540	560	470
pH	pH	7.0:10.5	AO	8.19	8.23	8.17	8.1	8.16	8.13	7.48
TDS	mg/L	500	AO	264	316	264	290	310	340	300
Turbidity	NTU			0.2	0.16	0.24	0.39	0.25	0.23	<0.1
Microbiological Parameters										
E.coli	MPN/100mL	<1	MAC	<1.0	<1.0	<1.0	0	0	0	0
Total Coliforms	MPN/100mL	<1	MAC	<1.0	<1.0	<1.0	0	0	0	0
Calculated Parameters										
Total Hardness ($CaCO_3$)	mg/L			173	221	176	189	184	189	142
Nitrate	mg/L	10	MAC	<0.020	<0.020	<0.020	<0.02	<0.02	<0.02	0.031
Elements										
Total Mercury	mg/L	0.001	MAC	<0.00001	<0.00001	<0.000002	<0.000002	<0.0000019	<0.0000019	<0.0000019
Total Metals										
Total Aluminum	mg/L	0.1	OG	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003
Total Antimony	mg/L	0.006	MAC	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Total Arsenic	mg/L	0.01	MAC	0.00163	0.00192	0.00164	0.0015	0.00164	0.00162	<0.0001
Total Barium	mg/L	1	MAC	0.03	0.0349	0.0305	0.0317	0.0324	0.0339	0.0272
Total Beryllium	mg/L			<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Total Bismuth	mg/L			<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Total Boron	mg/L	5	MAC	0.052	0.064	0.064	0.064	0.069	0.074	<0.05
Total Cadmium	mg/L	0.005	MAC	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001
Total Chromium	mg/L	0.05	MAC	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Total Cobalt	mg/L			<0.0005	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Total Copper	mg/L	1	AO	0.00237	0.00616	0.00523	0.00437	0.00311	0.00286	0.00518
Total Iron	mg/L	0.3	AO	0.0148	0.0167	0.0117	0.0201	0.0159	0.0151	0.0383
Total Lead	mg/L	0.01	MAC	<0.0002	<0.0002	<0.0002	0.00052	0.00024	0.00021	0.00078
Total Manganese	mg/L	0.02 0.12	AO MAC	0.0174	0.0084	0.0095	0.0168	0.0106	0.0141	0.0018
Total Molybdenum	mg/L			<0.001	0.0012	<0.001	<0.001	<0.001	0.0011	<0.001
Total Nickel	mg/L			<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Total Selenium	mg/L	0.05	MAC	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Total Silicon	mg/L			7.4	9.3	7.25	6.94	7.11	7	14.1
Total Silver	mg/L			<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002
Total Strontium	mg/L			0.359	0.396	0.389	0.348	0.387	0.399	0.0737
Total Thallium	mg/L			<0.00005	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001
Total Tin	mg/L			<0.005	0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Total Titanium	mg/L			<0.005	0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Total Uranium	mg/L	0.02	MAC	0.00035	0.00039	0.00032	0.00032	0.00034	0.00035	<0.0001
Total Vanadium	mg/L			<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Total Zinc	mg/L	5	AO	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.0073
Total Zirconium	mg/L			<0.0005	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Total Calcium	mg/L			43	56.5	44.7	48.4	47.5	47.8	36.7
Total Magnesium	mg/L			15.9	19.4	15.5	16.5	15.8	16.9	12.2
Total Potassium	mg/L			1.45	1.78	1.4	1.5	1.46	1.61	0.502
Total Sodium	mg/L	200	AO	23.6	29.6	25.1	27.2	28.7	30.7	32.7
Total Sulphur	mg/L			3.2	3.5	<3.0	<3.0	3.2	<3	<3