REGIONAL DISTRICT OF NANAIMO

Water Service Area Annual Report 2022

Decourcey Water System

June 2023

REGIONAL DISTRICT OF NANAIMO
Water & Utility 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 Decourcey 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 Decourcey Water Service Area

The Decourcey Water Service Area was established in 1998 in a rural area south of Nanaimo and comprises two properties on Bissel Road and three properties on Pylades Drive. The water source for the Decourcey Water Service Area comes from one groundwater well located nearby. The water supply is stored in one reservoir and is chlorinated manually. A map of the Decourcey Water Service Area is provided in Appendix A for reference.

2.1 Groundwater Wells

One groundwater production well is present at 3284 Bissel Road, Cedar, B.C.

Well / Name	Well Depth	Wellhead Protection In-Place	Treated/Untreated with Chlorine
#1	61.0 m	Yes	Treated

2.2 Reservoirs

One steel above-ground reservoir is present at 3284 Bissel Road, and has a capacity of 136 m^3 (30,000 imperial gallons).

2.3 Distribution System

The water distribution system in Decourcey is composed entirely of 150mm PVC watermains (0.7 km). Four fire hydrants are located in the water service area.

Decourcey Pumphouse and Water Storage Reservoir

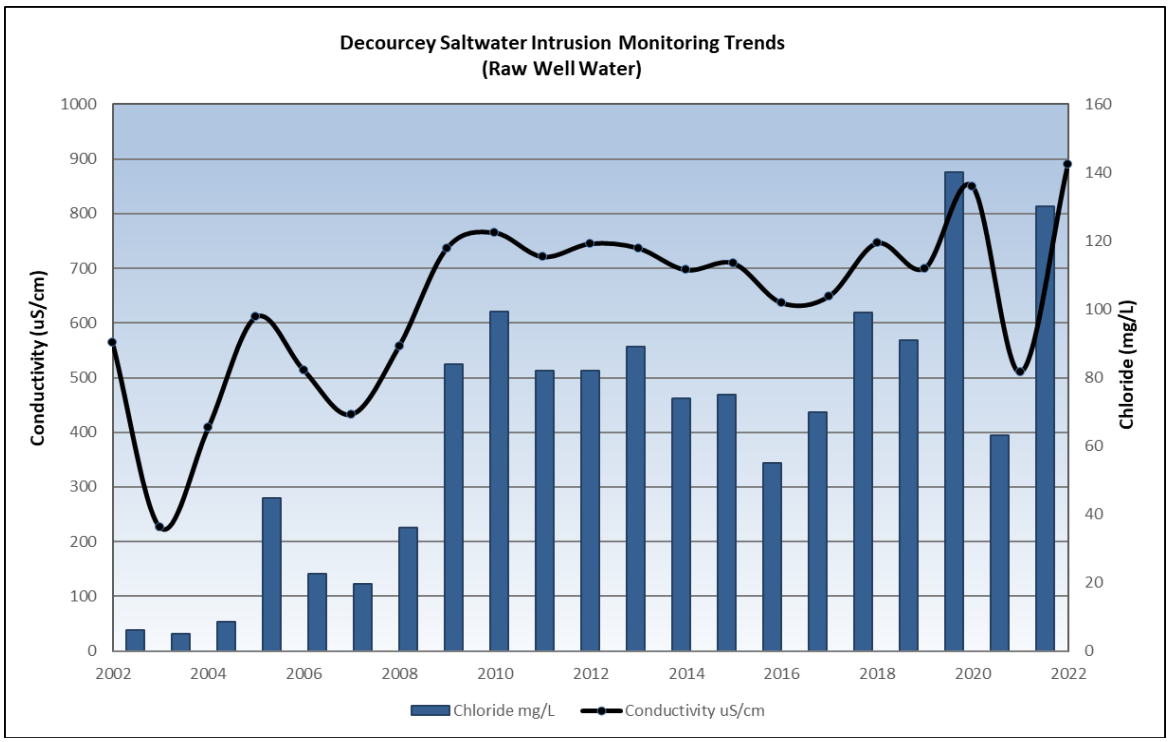
3.0 Water Sampling and Testing Program

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, Turbidity, Cl_2 Residual, Salinity, TDS
Monthly	BC Centre for Disease Control or Bureau Veritas	Total coliforms, E.Coli (BC CDC) Chloride, Fluoride (well water) (Bureau Veritas)
Quarterly	Bureau Veritas	THMs (Trihalomethanes in treated water)
Annual Source Water Testing (every Fall)	Bureau Veritas	Complete potability testing of all raw well water, including T-Ammonia
Annual System Water Testing (every Spring)	Bureau Veritas	Complete potability testing of distribution system, including T-Ammonia

4.0 Water Quality - Source Water and Distribution System

Water quality test reports are posted monthly on the RDN website at www.rdn.bc.ca/decourcey in the Regional Services section, under "Water & Utility Services". Tables of VIHA water quality testing results for both the source water and the distribution system are provided in Appendix B of this report.



Conductivity and Chloride levels in Decourcey well water.

5.0 Water Quality Inquiries and Complaints

Complaints received from the Decourcey water service area related mostly to residential water usage. Water Services staff responded to a small number of power outage alarms in 2022. The pump controls were reset manually by the on-call operator, and the water stored in the reservoir did not drop below 80% capacity.

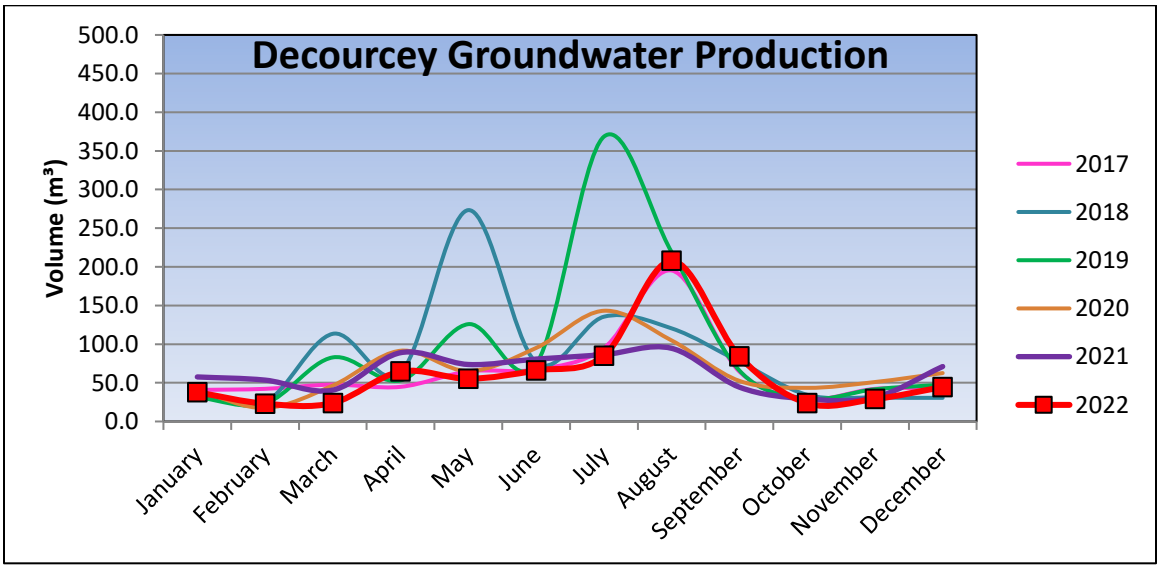
Weekly monitoring of individual household water use from May to September was undertaken by Water Services staff. Direct contact with property owners was made on several occasions to advise that water conservation should be taken quite seriously in order to protect the community drinking water supply, and to maintain water storage for fire protection. Continuous Stage 4 Watering Restrictions (no lawn watering) were continued to reduce the potential for saltwater intrusion into the production well.

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.

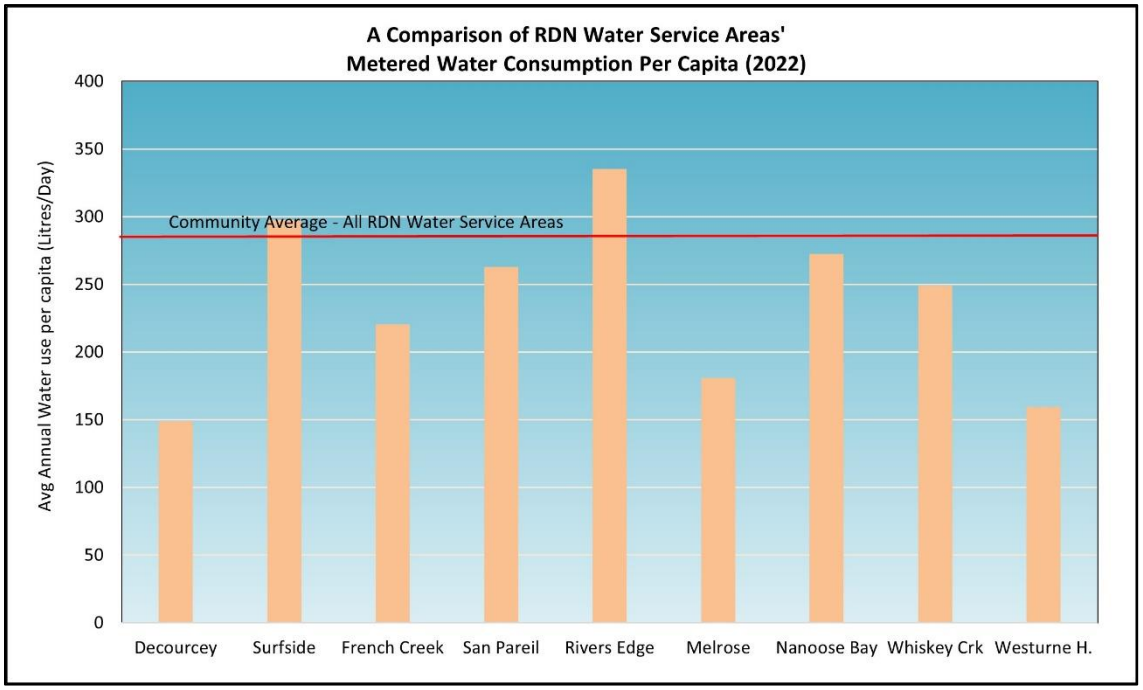
6.0 Groundwater Production and Consumption

The monthly groundwater production in the Decourcey system for the past 5 years is shown in the chart below. On average, groundwater production in 2022 was higher in the summer in comparison to some previous years.



Consumption

In the fall/winter of 2022, the average usage per home in Decourcey was 0.23 cubic metres per day (50.6 imperial gallons). In the summer of 2022, the average water usage was 0.62 cubic metres per day (136.4 imperial gallons). Based on these figures, the annual consumption per capita is estimated to be 149 L/day (based on 2.4 people/household). This consumption is ***45% less*** than the average of all the other RDN water systems of 269 L/day/capita in 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) in the spring following water main flushing. The water storage reservoir is cleaned every 3-4 years, as required. 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
- ✓ Chlorine Handling
- ✓ WHMIS (Workplace Hazardous Material Information System)
- ✓ Confined Space Awareness
- ✓ Fall Protection
- ✓ First Aid
- ✓ Silica Awareness

- ✓ Asbestos Awareness
- ✓ TDG (Transportation of Dangerous Goods

9.0 Water Service Area Projects

9.1 2022 Completed Studies & Projects

- Begin monthly conductivity testing;
- 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

- 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;
- Investigate 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.

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 its service areas in response to ongoing demand and the effects of climate change. Most RDN water service areas are not expected to expand, so growth in demand is not expected. Initiatives that provide resiliency for the groundwater sources that serve residents remain a high priority. Reservoir capacity and

redundancy are reviewed with regards to water storage during periods of drought, and 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. The 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 taking effect in 2023 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 (CCC)

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

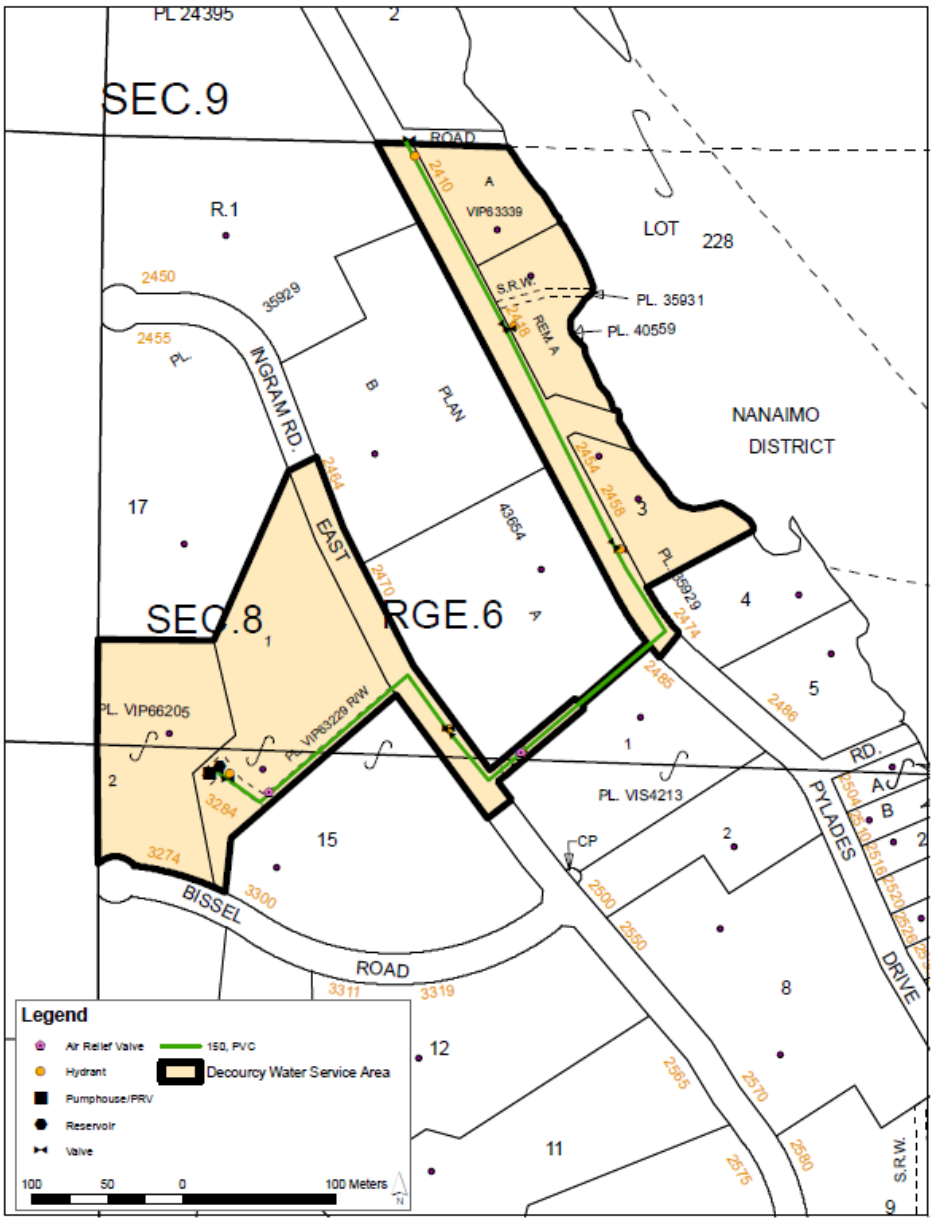
An annual report for 2023 will be prepared and submitted to Island Health in the Spring of 2024. Annual reports are also available on the RDN website: https://www.rdn.bc.ca/decourcey .

Stuart Channel
Yellow Point

APPENDIX A

MAP OF DECOURCEY

WATER SERVICE AREA



APPENDIX B

WATER QUALITY TESTING RESULTS

DECOURCEY WATER SYSTEM

Facility Location: Cedar

Facility Information: Facility Type: 2-14 connections DWS

Facility Sampling History:

Date Collected	Drinking Water System	Total E. Coli	Total Coliform	Site Name
01/24/2022	DECOURCEY WATER SYSTEM	LT1	LT1	2458 Pylades Drive
02/07/2022	DECOURCEY WATER SYSTEM	LT1	LT1	2458 Pylades Drive
03/07/2022	DECOURCEY WATER SYSTEM	QRWRT	QRWRT	2458 Pylades Drive
04/04/2022	DECOURCEY WATER SYSTEM	LT1	LT1	2458 Pylades Drive
04/11/2022	DECOURCEY WATER SYSTEM	QRWRT	QRWRT	2458 Pylades Drive
05/02/2022	DECOURCEY WATER SYSTEM	LT1	LT1	2458 Pylades Drive
06/06/2022	DECOURCEY WATER SYSTEM	LT1	LT1	2458 Pylades Drive
06/28/2022	DECOURCEY WATER SYSTEM	LT1	LT1	2458 Pylades Drive
07/04/2022	DECOURCEY WATER SYSTEM	LT1	LT1	2418 Pylades AUDIT
08/02/2022	DECOURCEY WATER SYSTEM	LT1	LT1	2458 Pylades Drive
09/26/2022	DECOURCEY WATER SYSTEM	LT1	LT1	2458 Pylades Drive
10/25/2022	DECOURCEY WATER SYSTEM	LT1	LT1	2458 Pylades Drive
12/19/2022	DECOURCEY WATER SYSTEM	QRWRT	QRWRT	2458 Pylades Drive

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
OG Overgrown - Meaning: Too many background bacteria to give an accurate count
EST Estimated Count
A Sample not tested; Too long in transit
C Sample leaked/broken in transit D Sample not tested; No collection date given

Regional District of Nanaimo - Water Services Department

Decourcey Water Analysis - 2022 Monthly Report

		BC Centre for Disease Control		RDN In-House Laboratory and Spectrophotometer									
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-Dec-22	2458 Pylades			0	0	7	7.40	0.03	370.0	0.39	799.0	Fe and Mn are no longer tested in-house. See Annual Tap Water Results at https://www.rdn.bc.ca/decourcey	
12-Dec-22	2458 Pylades			0	0	8	7.60	0.03	371.0	0.37	762.0		
19-Dec-22	2458 Pylades	0	0	0	0	8	7.84	0.04	379.0	0.38	771.0		
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)**

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:

Iron and Manganese are no longer being tested in-house.

A full potability scan is completed once per year at an external lab that includes metals and minerals.

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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-Nov-22	2458 Pylades			0	0	14	7.70	0.01	400.0	0.40	815.0	Fe and Mn are no longer tested in-house. See Annual Tap Water Results at https://www.rdn.bc.ca/decourcey	
8-Nov-22	2458 Pylades	0	0	0	0	11	7.40	0.00	397.0	0.40	809.0		
15-Nov-22	2458 Pylades			0	0	10	7.49	0.00	393.0	0.39	799.0		
21-Nov-22	2458 Pylades			0	0	n/a	7.18	0.02	389.0	0.39	797.0		
30-Nov-22	2458 Pylades			0	0	9	7.51	0.03	398.0	0.41	813.0		
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

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4-Oct-22	2458 Pylades			0	0	16	7.50	0.02	422.0	0.42	860.0	Fe and Mn are no longer tested in-house. See Annual Tap Water Results at https://www.rdn.bc.ca/decourcey	
11-Oct-22	2458 Pylades			0	0	17	7.30	0.01	407.0	0.41	831.0		
18-Oct-22	2458 Pylades			0	0	15	7.34	0.03	401.0	0.40	820.0		
25-Oct-22	2458 Pylades	0	0	0	0	15	7.31	0.03	396.0	0.39	810.0		
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

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4-Sep-22	2458 Pylades			0	0	16	7.50	0.02	422.0	0.42	860.0	Fe and Mn are no longer tested in-house. See Annual Tap Water Results at https://www.rdn.bc.ca/decourcey	
12-Sep-22	2458 Pylades			0	0	18	7.69	0.02	408.0	0.41	833.0		
21-Sep-22	2458 Pylades			0	0			0.02					
26-Sep-22	2458 Pylades	0	0	0	0	16	7.40	0.02	400.0	0.40	817.0		
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

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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	2458 Pylades	0	0	0	0	19	7.35	0.01	360.0	0.36	737.0	Fe and Mn are no longer tested in-house. See Annual Tap Water Results at https://www.rdn.bc.ca/decourcey	
8-Aug-22	2458 Pylades			0	0	19	7.54	0.02	367.0	0.37	751.0		
15-Aug-22	2458 Pylades			0	0	19	7.36	0.03	375.0	0.37	768.0		
22-Aug-22	2458 Pylades			0	0	18	7.66	0.02	393.0	0.38	804.0		
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

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4-Jul-22	2458 Pylades	0	0	0	0	15	7.43	0.03	321.0	0.32	659.0	Fe and Mn are no longer tested in-house. See Annual Tap Water Results at https://www.rdn.bc.ca/decourcey	
11-Jul-22	2458 Pylades			0	0	18	7.40	0.04	312.0	0.31	632.0		
18-Jul-22	2458 Pylades			0	0	18	7.42	0.02	337.0	0.34	680.0		
27-Jul-22	2458 Pylades			0	0	19	7.34	0.02	330.0	0.33	678.0		
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

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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-Jun-22	2458 Pylades	0	0	0	0	12	7.38	0.00	327.0	0.33	671.0	Fe and Mn are no longer tested in-house. See Annual Tap Water Results at https://www.rdn.bc.ca/decourcey	
14-Jun-22	2458 Pylades			0	0	14	7.61	0.02	356.0	0.36	730.0		
20-Jun-22	2458 Pylades			0	0	15	7.37	0.03	318.0	0.32	653.0		
28-Jun-22	2458 Pylades			0	0	15	7.41	0.00	319.0	0.32	654.0		
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

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2-May-22	2458 Pylades	0	0	0	0	9	7.29	0.03	310.0	0.32	700.0	Fe and Mn are no longer tested in-house. See Annual Tap Water Results at https://www.rdn.bc.ca/decourcey	
9-May-22	2458 Pylades			0	0	10	7.55	0.03	325.0	0.33	667.0		
17-May-22	2458 Pylades			0	0	10	7.47	0.03	329.0	0.33	675.0		
24-May-22	2458 Pylades			0	0	12	7.56	0.00	332.0	0.33	681.0		
30-May-22	2458 Pylades			0	0	12	7.80	0.02	327.0	0.33	671.0		
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

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		BC Centre for Disease Control		RDN In-House Laboratory and Spectrophotometer									
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)
4-Apr-22	2458 Pylades			0	0	9	7.85	0.01	341.0	0.36	699.0	Fe and Mn are no longer tested in-house. See Annual Tap Water Results at https://www.rdn.bc.ca/decourcey	
11-Apr-22	2458 Pylades	0	0	0	0	10	7.71	0.01	337.0	0.34	690.0		
18-Apr-22	2458 Pylades			0	0	10	7.39	0.03	327.0	0.33	671.0		
26-Apr-22	2458 Pylades			0	0	10	7.28	0.03	319.0	0.32	657.0		
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)**

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:

Iron and Manganese are no longer being tested in-house.

A full potability scan, including metals and minerals, is completed once per year at an external lab.

Regional District of Nanaimo - Water Services Department

Decourcey Water Analysis - 2022 Monthly Report

		BC Centre for Disease Control		RDN In-House Laboratory and Spectrophotometer									
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)
7-Mar-22	2458 Pylades	0	0	0	0	6	7.96	0.04	343.0	0.34	704.0	Fe and Mn are no longer tested in-house. See Annual Tap Water Results at https://www.rdn.bc.ca/decourcey	
15-Mar-22	2458 Pylades			0	0	8	7.76	0.03	340.0	0.34	697.0		
21-Dec-22	2458 Pylades			0	0	7	7.82	0.00	343.0	0.34	704.0		
28-Mar-22	2458 Pylades			0	0	9	7.78	0.00	341.0	0.34	699.0		
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)**

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:

Iron and Manganese are no longer being tested in-house.

A full potability scan, including metals and minerals, is completed once per year at an external lab.

Regional District of Nanaimo - Water Services Department

Decourcey Water Analysis - 2022 Monthly Report

		BC Centre for Disease Control		RDN In-House Laboratory and Spectrophotometer									
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)
7-Feb-22	2458 Pylades	0	0	0	0	6	7.65	0.03	359.0	0.36	734.0	Fe and Mn are no longer tested in-house. See Annual Tap Water Results at https://www.rdn.bc.ca/decourcey	
14-Feb-22	2458 Pylades			0	0	7	7.40	0.03	350.0	0.35	715.0		
23-Feb-22	2458 Pylades			0	0	6	7.72	0.00	354.0	0.35	725.0		
28-Feb-22	2458 Pylades			0	0	n/a	7.48	0.00	336.0	0.34	690.0		
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)**

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:

Iron and Manganese are no longer being tested in-house.

A full potability scan, including metals and minerals, is completed once per year at an external lab.

Regional District of Nanaimo - Water Services Department

Decourcey Water Analysis - 2022 Monthly Report

		BC Centre for Disease Control		RDN In-House Laboratory and Spectrophotometer									
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)
4-Jan-22	2458 Pylades			0	0	7	7.57	0.04	379.0	0.38	769.0	Fe and Mn are no longer tested in-house. See Annual Tap Water Results at https://www.rdn.bc.ca/decourcey	
11-Jan-22	2458 Pylades			0	0	5	7.44	0.01	350.0	0.35	716.0		
18-Jan-22	2458 Pylades			0	0	8	6.83	0.04	354.0	0.36	724.0		
24-Jan-22	2458 Pylades	0	0	0	0	8	7.53	0.05	359.0	0.36	737.0		
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:

Iron and Manganese are no longer being tested in-house.

A full potability scan, including metals and minerals, is completed once per year at an external lab.

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

Decourcey Distribution (Tap Water) Analysis
2458 Pylades Drive

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 (CDWG)

	Units	CDWG		May 9 2016	May 2 2017	May 8 2018	May 14 2019	May 20 2020	May 18 2021	May 30 2022
Miscellaneous Inorganics										
Fluoride	mg/L	1.5	MAC	0.15	0.15	0.14	0.14	0.15	0.13	0.13
Alkalinity (total as CaCO)	mg/L			196	180	172	186	170	180	180
Anions										
Dissolved Sulphate	mg/L	500	AO	26.3	21.4	24.6	23.2	26	27	22
Dissolved Chloride	mg/L	250	AO	81	55	85	79	100	130	97
Nitrite	mg/L	1	MAC	<0.0050	<0.0050	<0.0050	<0.005	<0.005	<0.005	<0.005
Miscellaneous										
Apparent Colour	Colour Unit			5	5	10	<2	10	10	<5
Nutrients										
Total Ammonia	mg/L			0.0062	0.12	0.13	<0.015	0.016	<0.015	<0.015
Physical Properties										
Conductivity	µS/cm			689	553	659	635	700	790	690
pH	pH	7.0:10.5	AO	8.25	8.46	8.37	8.22	8.07	8.11	8.29
TDS	mg/L	500	AO	384	310	332	336	470	390	400
Turbidity	NTU			0.16	0.18	0.25	0.33	0.27	0.21	0.37
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)	mg/L			42	36.7	38.3	40	45.2	50.7	47.3
Nitrate	mg/L	10	MAC	<0.020	0.022	0.022	<0.02	0.024	<0.02	0.038
Elements										
Total Mercury	mg/L	0.001	MAC	<0.00001	<0.00001	0.0000116	<0.000002	<0.0000019	<0.0000019	<0.0000019
Total Metals										
Total Aluminum	mg/L	0.1	OG	<0.003	0.0058	0.006	0.005	<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	<0.00022	0.00013	0.00019	0.00019	0.00016	0.00016	0.00014
Total Barium	mg/L	1	MAC	0.0098	0.0112	0.0115	0.0116	0.0126	0.0124	0.0134
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	0.109	0.099	0.103	0.112	0.121	0.113	0.103
Total Cadmium	mg/L	0.005	MAC	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	0.000021
Total Chromium	mg/L	0.05	MAC	<0.001	<0.001	<0.001	<0.001	<0.001	0.0012	<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	0.00403	0.00509	0.00318	0.00578	0.00446	0.00631	0.00775
Total Iron	mg/L	0.3	AO	0.0163	0.0158	0.0224	0.022	0.0186	0.033	0.0607
Total Lead	mg/L	0.01	MAC	<0.0002	<0.0002	0.00021	0.00023	<0.0002	0.00021	0.00031
Total Lithium	mg/L						0.0163			
Total Manganese	mg/L	0.02 0.12	AO MAC	<0.001	<0.001	0.0022	0.0014	<0.001	<0.001	0.0014
Total Molybdenum	mg/L			<0.001	<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	<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			9	8.08	7.31	7.47	7.72	7.87	8.56
Total Silver	mg/L			<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002
Total Strontium	mg/L			0.177	0.139	0.144	0.154	0.193	0.219	0.192
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	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<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	0.0258	0.0386	0.0309	0.0473	0.0349	0.0406	0.0533
Total Zirconium	mg/L			<0.0005	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Total Calcium	mg/L			12.7	11.1	11.9	12.3	13.9	15.5	14.6
Total Magnesium	mg/L			2.49	2.17	2.1	2.27	2.56	2.94	2.61
Total Potassium	mg/L			0.886	0.732	0.66	0.78	0.836	0.91	0.769
Total Sodium	mg/L	200	AO	128	112	110	123	130	136	118
Total Sulphur	mg/L			9.2	7.8	5.7	8.1	8.6	8.6	8.1

REGIONAL DISTRICT OF NANAIMO

Decourcey Raw Well Water Analysis
Between 3274 & 3284 Bisell Road

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 11 2016	September 19 2017	October 23 2018	October 22 2019	October 16 2020	November 2 2021	November 8 2022
Miscellaneous Inorganics										
Fluoride	mg/L	1.5	MAC	0.2	0.17	0.15	0.15	0.14	0.1	0.14
Alkalinity (total as CaCO)	mg/L			214	207	202	200	180	150	200
Anions										
Dissolved Sulphate	mg/L	500	AO	22	21.9	25.6	25	25	15	24
Dissolved Chloride	mg/L	250	AO	55	70	99	91	140	63	130
Nitrite	mg/L	1	MAC	<0.0050	<0.0050	<0.0050	<0.005	<0.005	<0.005	<0.005
Miscellaneous										
Apparent Colour	Colour Unit			5	10	5	<5	5	<5	<5
Nutrients										
Total Ammonia	mg/L			0.094	<0.020	0.094	0.078	0.029	<0.015	<0.015
Physical Properties										
Conductivity	µS/cm			637	649	746	700	850	510	890
pH	pH	7.0:10.5	AO	7.99	8.41	8.27	8.09	7.94	7.26	7.96
TDS	mg/L	500	AO	356	350	406	390	470	300	470
Turbidity	NTU			0.22	0.25	0.32	0.33	0.19	0.83	0.61
Microbiological Parameters										
E.coli	MPN/100mL	<1	MAC	<1	<1.0	<1.0	0	0	0	0
Total Coliforms	MPN/100mL	<1	MAC	**3.1**	<1.0	<1.0	**27**	**32**	0	0
Calculated Parameters										
Total Hardness (CaCO)	mg/L			34.4	35.8	46.3	49.8	57.5	34.8	59.7
Nitrate	mg/L	10	MAC	0.126	<0.020	<0.020	0.066	0.042	0.366	0.038
Elements										
Total Mercury	mg/L	0.001	MAC	<0.00001	<0.00001	0.0000048	0.0000084	0.0000036	0.0000032	0.0000043
Total Metals										
Total Aluminum	mg/L	0.1	OG	0.0067	0.0128	0.0054	0.0067	<0.003	0.0309	0.0101
Total Antimony	mg/L	0.006	MAC	<0.0005	<0.0005	<0.00050	<0.0005	<0.0005	<0.0005	<0.0005
Total Arsenic	mg/L	0.01	MAC	0.00031	0.00025	0.00023	0.00023	0.00017	0.00018	0.00019
Total Barium	mg/L	1	MAC	0.0064	0.0068	0.0093	0.0091	0.0115	0.0094	0.0102
Total Beryllium	mg/L			<0.0001	<0.0001	<0.00010	<0.0001	<0.0001	<0.0001	<0.0001
Total Bismuth	mg/L			<0.001	<0.001	<0.0010	<0.001	<0.001	<0.001	<0.001
Total Boron	mg/L	5	MAC	0.148	0.152	0.133	0.129	0.115	0.09	0.116
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	<0.0010	0.0011	<0.001	<0.001	0.0014
Total Cobalt	mg/L			<0.0005	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Total Copper	mg/L	1	AO	0.00422	0.00206	0.00156	0.00187	0.00143	0.00184	0.00609
Total Iron	mg/L	0.3	AO	0.0133	0.0186	0.013	0.0803	<0.005	0.0406	0.0306
Total Lead	mg/L	0.01	MAC	0.00026	0.0002	0.00023	0.00023	<0.0002	<0.0002	0.00028
Total Manganese	mg/L mg/L	0.02 0.12	AO MAC	0.0145	0.0094	**0.0304**	**0.0265**	**0.0503**	**0.0334**	0.0091
Total Molybdenum	mg/L			<0.001	<0.001	<0.0010	<0.001	<0.001	<0.001	<0.001
Total Nickel	mg/L			<0.001	<0.001	<0.0010	<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			6.43	7.18	7.75	7.67	7.8	6.96	7.85
Total Silver	mg/L			<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002
Total Strontium	mg/L			0.147	0.142	0.203	0.209	0.255	0.123	0.228
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	0.00015	0.00014	<0.0001	<0.0001	<0.0001	<0.0001	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	0.0067	0.007	0.0065	0.0061	0.0093	0.0104
Total Zirconium	mg/L			<0.0005	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Total Calcium	mg/L			10.5	11.1	14.2	15.5	17.8	10.6	18.6
Total Magnesium	mg/L			1.98	1.99	2.63	2.71	3.18	2.03	3.23
Total Potassium	mg/L			0.651	0.663	0.857	0.811	0.97	0.673	0.895
Total Sodium	mg/L	200	AO	126	130	142	128	144	96.8	148
Total Sulphur	mg/L			7	7.4	8.2	7.6	8.4	3.8	7.3

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

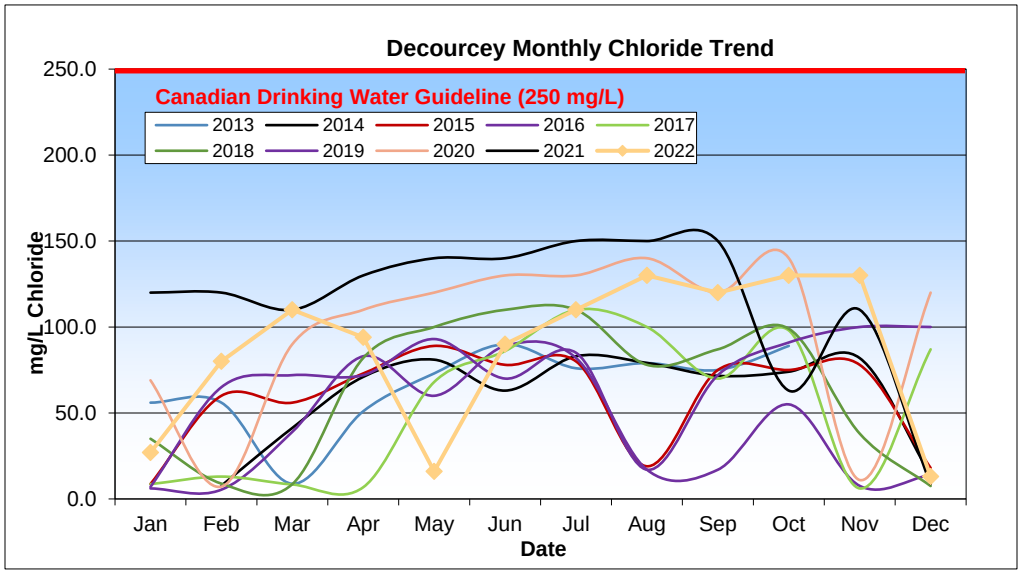
Type	Parameter (published, reaffirmed)	MAC (mg/L)	Other value (mg/L)	Common sources of parameter in water	Health considerations	Comments
I = Inorganic chemical parameter	Manganese (2019)	0.12	AO: <0.02	Dissolution of naturally-occurring minerals commonly found in soil and rock. Other sources include 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.

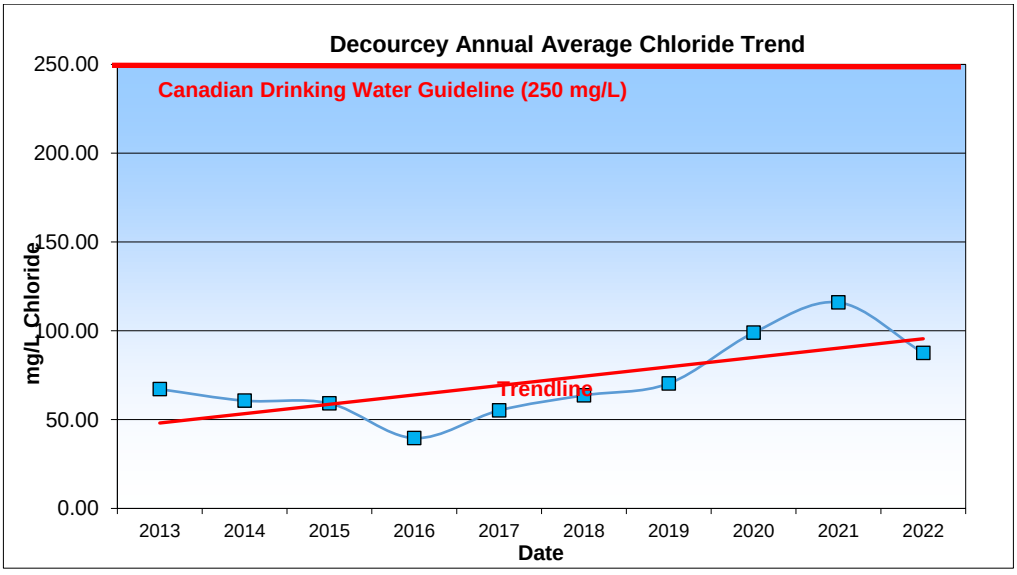
REGIONAL DISTRICT OF NANAIMO

Decourcey Monthly Well Testing

Chloride (mg/L)

Month	2014	2015	2016	2017	2018	2019	2020	2021	2022
Jan		8.7	6.1	8.6	35.0	7	69	120.0	27.0
Feb	7.7	60	5.4	13.0	8.9	65	7.2	120	80
Mar	41.3	56	39.0	8.4	8.6	72.0	90	110	110
Apr	71.0	73	83.0	6.8	82.0	72	110	130	94
May	81.0	89	60.0	68	100.0	93	120	140	16
Jun	63.0	78	89.0	86	110.0	70	130	140	90
Jul	83.0	80	82.0	110	110.0	85	130	150	110
Aug	79.1	19	17.0	100	78.0	17	140	150	130
Sep	71.6	75	17.0	70	87.0	72	120	150	120
Oct	74	75	55.0	98	99.0	91	140	63	130
Nov	81.9	78	7.6	6.1	38.0	100	11	110	130
Dec	13.7	18	14.0	87	7.5	100	120	8.7	13
Avg	**60.66**	**59.14**	**39.59**	**55.16**	**63.67**	70.33	98.93	115.98	87.50



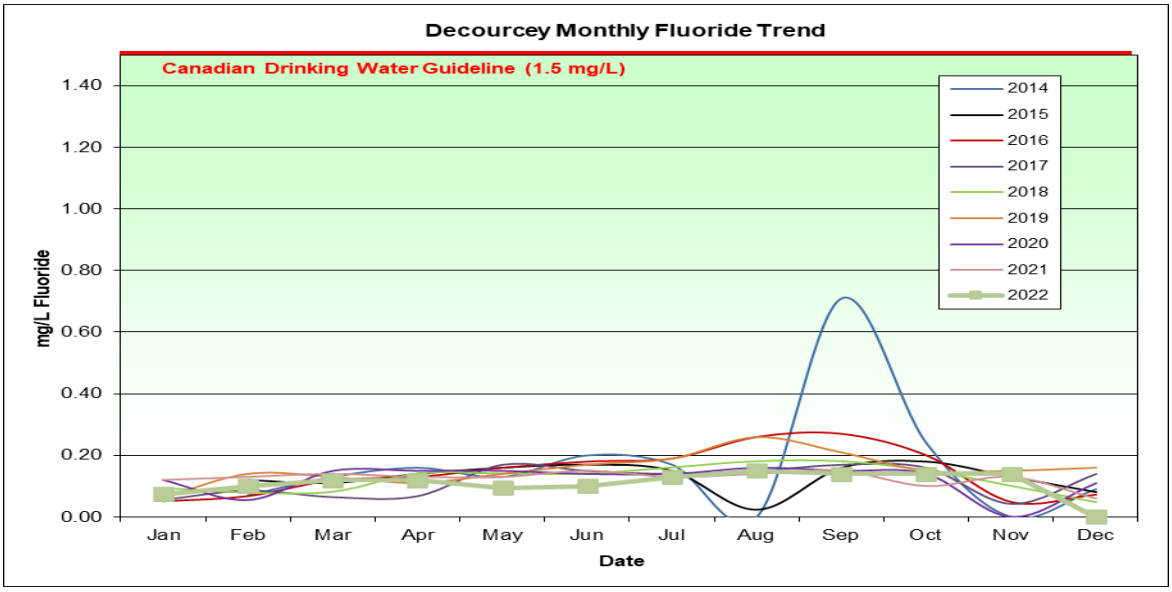


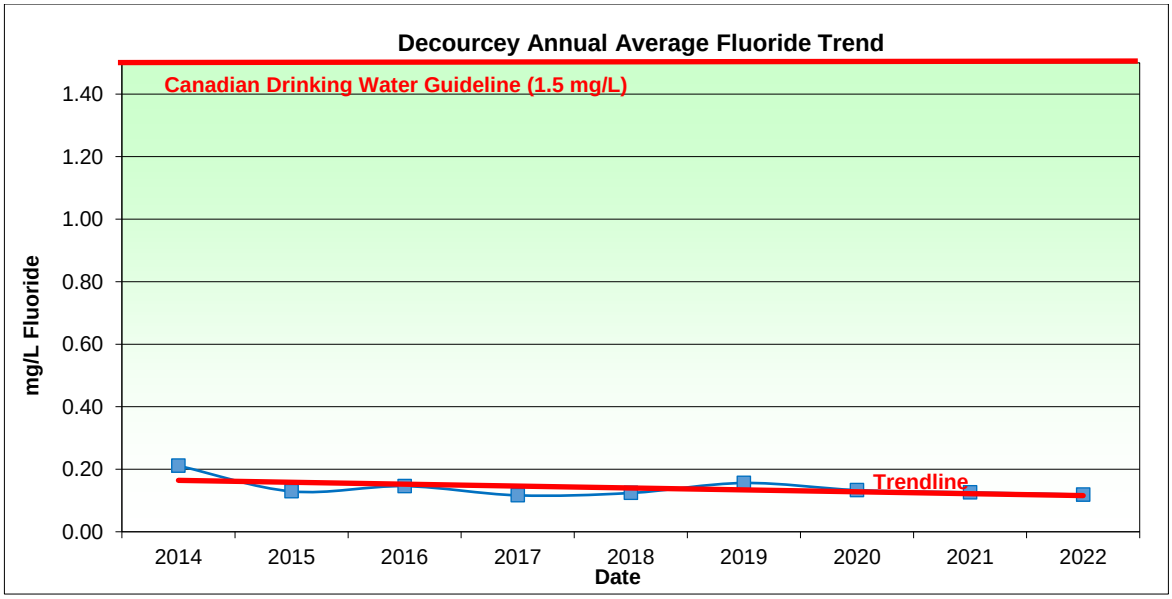
REGIONAL DISTRICT OF NANAIMO

Decourcey Monthly Well Testing

Fluoride (mg/L)

Month	2014	2015	2016	2017	2018	2019	2020	2021	2022
Jan			0.051	0.056	0.093	0.062	0.12	0.12	0.074
Feb	0.07	0.12	0.068	0.086	0.078	0.14	0.055	0.13	0.1
Mar	0.13	0.11	0.12	0.065	0.081	0.13	0.15	0.14	0.12
Apr	0.16	0.14	0.13	0.068	0.14	0.11	0.15	0.13	0.12
May	0.13	0.16	0.16	0.17	0.14	0.14	0.15	0.13	0.094
Jun	0.20	0.17	0.18	0.15	0.14	0.17	0.14	0.15	0.1
Jul	0.17	0.15	0.19	0.14	0.16	0.19	0.14	0.13	0.13
Aug	<0.05	0.022	0.26	0.15	0.18	0.26	0.16	0.14	0.15
Sep	0.71	0.16	0.27	0.17	0.18	0.21	0.15	0.15	0.14
Oct	0.24	0.18	0.2	0.16	0.15	0.15	0.14	0.1	0.14
Nov	<0.05	0.13	0.049	0.043	0.1	0.15	<0.05	0.13	0.14
Dec	0.09	0.08	0.073	0.14	0.047	0.16	0.11	0.059	<0.05
Avg	**0.21**	**0.13**	**0.15**	**0.12**	**0.12**	**0.16**	**0.13**	**0.13**	**0.12**





REGIONAL DISTRICT OF NANAIMO

Annual THM Data 2014-2022

2014	Chloroform (mg/L)	Dibromochloromethane (mg/L)	Bromodichloromethane (mg/L)	Bromoform (mg/L)	Total THM (mg/L)
M	<0.001	0.004	0.001	0.141	0.146
J	0.001	0.005	<0.001	0.048	0.054
S	<0.001	<0.001	<0.001	0.025	0.025
D	0.001	0.003	<0.001	0.042	0.046
2015					
M	0.003	0.0046	0.0019	0.038	0.048
J	<0.001	0.002	<0.001	0.017	0.019
S	<0.001	0.0025	<0.001	0.014	0.017
D	0.0013	0.0054	0.0015	0.065	0.0732
2016					
M	0.0039	0.012	0.0029	0.12	0.139
J	<0.001	0.001	<0.001	0.0063	0.0073
S	<0.001	0.0021	<0.001	0.0042	0.0063
D	0.002	0.0043	0.0015	0.014	0.0218
2017					
M	0.0034	0.0044	0.0018	0.027	0.0366
J	0.0021	0.0047	0.0014	0.043	0.0512
S	<0.001	0.0011	<0.001	0.0076	0.0087
D	0.0021	0.004	0.0014	0.065	0.0725
2018					
M	<0.001	0.0051	<0.001	0.13	0.1351
J	<0.001	0.0029	<0.001	0.02	0.0229
S	<0.001	0.0019	<0.001	0.014	0.016
D	<0.001	0.0022	<0.001	0.014	0.016
2019					
M	0.0023	0.0033	0.001	0.019	0.026
J	<0.001	0.0015	<0.001	0.0093	0.011
S	<0.001	0.0027	<0.001	0.015	0.017
D	0.001	0.003	0.0014	0.023	0.029
2020					
M	0.0019	0.0028	0.0012	0.032	0.037
J	<0.001	0.0028	0.001	0.036	0.04
S	<0.001	0.0022	<0.001	0.014	0.016
D	0.001	0.0023	<0.001	0.031	0.035
2021					
M	0.0025	0.0026	<0.001	0.032	0.037
J	<0.001	0.0027	<0.001	0.028	0.031
S	<0.001	0.0022	<0.001	0.025	0.027
D	0.0023	0.0053	0.0017	0.078	0.087
2022					
M	0.0027	0.0046	0.002	0.083	0.093
J	0.0012	0.0032	<0.001	0.071	0.075
S	<0.001	0.0022	<0.001	0.027	0.029
D	0.0019	0.0038	<0.001	0.084	0.089

REGIONAL DISTRICT OF NANAIMO

Decourcey Quarterly Testing — THM's (mg/L)

Month	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Jan										
Feb										
Mar	0.345	0.146	0.048	0.1388	0.0366	0.167	0.026	0.037	0.037	0.093
Apr										
May						0.1351				
Jun	0.027	0.054	0.019	0.0073	0.0512	0.0229	0.011	0.04	0.031	
Jul										0.075
Aug										
Sep	0.024	0.025	0.017	0.0063	0.0087	0.016	0.017	0.016	0.027	0.029
Oct										
Nov										
Dec	0.044	0.046	0.0732	0.0218	0.0725	0.016	0.029	0.035	0.087	0.089
Avg	0.110	0.068	0.039	0.0436	0.0423	0.0556	0.02075	0.032	0.0455	0.0703