island health

DRINKING WATER SYSTEM ANNUAL REPORT

Reporting Period: January 1st to December 31st, 2023 (year)

Water System Bald Mountain Water System

Water System Owner Cowichan Valley Regional District

Primary Contact Name (Operator or Manager) Vanessa Thomson

Phone Number (Operator or Manager) 250-746-2535

E-mail (Operator or Manager) Vanessa.Thomson@cvrd.bc.ca

DESCRIBE YOUR WATER SUPPLY SYSTEM

What is the Source(s) of Raw Water?

☒ Deep Well ☐ Shallow Well ☐ Surface Water ☐ Other

If other, specify details:

Does the Drinking Water System have Primary Disinfection? ☒ Yes ☐ No

☒ Chlorination ☒ Ultraviolet Light ☐ Ozone ☐ Other

If other, specify details:

Does the Drinking Water System have Secondary Disinfection? ☒ Yes ☐ No

☒ Chlorination ☐ Other

If other, specify details:

Does the Drinking Water System have Filtration? ☐ Yes ☒ No

Check all boxes that apply

☐ Cartridge Filter(s) ☐ Carbon Filter ☐ Sand Filtration ☐ Reverse Osmosis ☐ Other

If other, specify details: CVRD Operation Department, 175 Ingram Street, Duncan, BC

PUBLIC REPORTING

Emergency Response & Contingency Plan (ERCP)

Is your ERCP up to Date? ☒ Yes ☐ No

How do you Inform the System Users of the ERCP?

☐ Hand Delivered ☐ Bulletin Board ☐ Newspaper ☐ Utility Bill Insert ☐ Website

☒ Other (specify details)

Drinking Water System Annual Report

How do you Inform the System Users of the Annual Report?

☐ Hand Delivered ☐ Bulletin Board ☐ Newspaper ☐ Utility Bill Insert ☒ Website

☐ Other (specify details)

COMPLIANCE WITH OPERATING PERMIT

List the conditions of your Operating Permit (Contact the DWO for a copy if needed):

Are you in compliance with your Operating Permit? ☒ Yes ☐ No

BACTERIOLOGICAL TESTING AND DRINKING WATER PROTECTION REGULATION WATER QUALITY STANDARDS

How many bacteriological samples were collected during this reporting period? 56

What is the minimum required sampling frequency for this system? (#samples/month) 4 samples/month

Additional sampling details:

Was the minimum required sampling frequency achieved? ☒ Yes ☐ No

Comments: CVRD is committed to 4 samples/month

Bacteriological summary attached to this report? ☒ Yes ☐ No

If no, how do the users of the system view the results?

WATER QUALITY STANDARDS FOR POTABLE WATER

Parameter:	***Standard:***	**Did this system meet standard?**	
Escherichia coli (for all samples)	No detectable *Escherichia coli* per 100ml	☒ Yes	☐ No
Total Coliform Bacteria *(if only 1 sample collected in a 30 day period)*	No detectable total coliform bacteria per 100ml	☒ Yes	☐ No
Total Coliform Bacteria *(if more than 1 sample collected in a 30 day period)*	No more than 10% of samples contain total coliform bacteria, **and** No sample has more than 10 total coliform bacteria per 100ml	☒ Yes	☐ No

If the system did not meet any of above Drinking Water Protection Regulation standards, record the results in the table below; attach additional sheets if necessary.

Date	TC/100ml	E.coli/100ml	Reason	Corrective Action

CHEMICAL SAMPLING COMPLETED DURING THIS REPORTING PERIOD

Was any chemical sampling conducted during reporting period?	■ Yes	☐ No
If no, when were the last chemical samples conducted for this system? (date)		☐ Don't know
If yes, attach a list of the chemical results	Full Spectrum Report for Source and Distribution	
If any water samples did not meet the Guidelines for Canadian Drinking Water Quality, record the results in the table below; attach additional sheets if necessary.		
Next scheduled full chemical test (date)	Source and Distribution - March 2024	

Parameter	Result	Corrective Action / Treatment / Comments
Manganese	23.5	April 12: Middle Well (Raw) - Above AO, but below MAC. Re-sampled.
Manganese	21.2	April 27: Middle Well (Raw) (second sample) - Above AO, but below MAC. Lower than first sample.
Lead	29.4	April 27: East End Well (Raw) (second samples) - Above MAC. Re-sampled
		Re-sampled result (May 4) was well below MAC (0.99).

ADDITIONAL TESTING

Does the system have analyzers for continuous monitoring? ■ Yes ☐ No

If yes, check all boxes that apply:

■ Chlorine ☐ Turbidity ☐ Other (details)

Are the results available on request? Yes

If any additional testing or sampling was conducted, record results in the table below; attach additional sheets if necessary.

Additional Testing & Reason for Sampling	Corrective Action Taken

WATER QUALITY COMPLAINTS

Were there any water quality complaints in this reporting period? (e.g. taste, odour, colour etc.) ☐ Yes ■ No

If yes, complete the table below; attach additional sheets if necessary.

Date	Water Quality Complaint	Corrective Action / Treatment

OPERATIONAL PROBLEMS

Were there any operational problems during this reporting period? (e.g. insufficient water supply, malfunction of disinfection equipment, line breaks, elevated turbidity etc.). ☐ Yes ■ No

If yes, complete the table below; attach additional sheets if necessary.

Incident Date	Type of Operational Problem	Corrective Action Taken

MAJOR UPGRADES/REPAIRS & EXPENSES

Were there any major upgrades/repairs or any major costs incurred during this reporting period? ■ Yes ☐ No

If yes, complete the table below; attach additional sheets if necessary.

Major Upgrades/Expenses	Details
Improvements required by DWO	
Additions/changes to system	
Purchase or install new equipment	
Equipment repair or replacement	
Annual maintenance of system	System flushing, hydrant/genset maintenance, UV bulb replacement
Specialist report	
Other	

FUTURE IMPROVEMENTS

Are there any plans for future improvements? ■ Yes ☐ No

If yes, complete the table below; attach additional sheets if necessary.

Future Upgrades or Improvements	Estimated Date of Completion

Click here to enter a date. February 8, 2024 **DATE COMPLETED:**	Tai Williams **COMPLETED BY:**

BALD MOUNTAIN WATER SYSTEM

Facility Information

Location 175 Ingram Street Duncan

Type 301 - 10,0000 Connections

Facility Sampling History

Location	Date	Total Coliform	E. Coli/Enterococci
S3 Lot 63	19-Dec-2023	LT1	LT1
S1 Reservoir	11-Dec-2023	LT1	LT1
S4 Lot 8	11-Dec-2023	LT1	LT1
S3 Lot 63	05-Dec-2023	LT1	LT1
S1 Reservoir	27-Nov-2023	LT1	LT1
S3 Lot 63	22-Nov-2023	LT1	LT1
S1 Reservoir	15-Nov-2023	LT1	LT1
S3 Lot 63	06-Nov-2023	LT1	LT1
S4 Lot 8	31- Oct-2023	LT1	LT1
S1 Reservoir	24- Oct-2023	LT1	LT1
S2 RAW WATER 9455 Marble Bay Road	24- Oct-2023	LT1	LT1
S3 Lot 63	17- Oct-2023	LT1	LT1
S4 Lot 8	10- Oct-2023	LT1	LT1
S3 Lot 63	03- Oct-2023	LT1	LT1
S1 Reservoir	26-Sep-2023	LT1	LT1
S3 Lot 63	19-Sep-2023	LT1	LT1
S4 Lot 8	12-Sep-2023	LT1	LT1
S3 Lot 63	05-Sep-2023	LT1	LT1
S1 Reservoir	29-Aug-2023	LT1	LT1
S3 Lot 63	21-Aug-2023	LT1	LT1
S4 Lot 8	15-Aug-2023	LT1	LT1
S3 Lot 63	09-Aug-2023	LT1	LT1
S1 Reservoir	31-Jul-2023	LT1	LT1
S3 Lot 63	24-Jul-2023	LT1	LT1
S4 Lot 8	17-Jul-2023	LT1	LT1
S1 Reservoir	10-Jul-2023	LT1	LT1
S7 Lot 74, Lot 71 Marble Bay Road	10-Jul-2023	LT1	LT1
S3 Lot 63	05-Jul-2023	LT1	LT1
S7 Lot 74, Lot 71 Marble Bay Road	05-Jul-2023	LT1	LT1
S1 Reservoir	26-Jun-2023	LT1	LT1
S3 Lot 63	19-Jun-2023	QRWRT	QRWRT
S2 RAW WATER 9455 Marble Bay Road	13-Jun-2023	LT1	LT1
S4 Lot 8	13-Jun-2023	LT1	LT1
S3 Lot 63	06-Jun-2023	QRWRT	QRWRT
S1 Reservoir	30-May-2023	LT1	LT1
S3 Lot 63	24-May-2023	LT1	LT1
S1 Reservoir	16-May-2023	LT1	LT1
S3 Lot 63	08-May-2023	LT1	LT1
S4 Lot 8	02-May-2023	LT1	LT1
S1 Reservoir	24-Apr-2023	LT1	LT1
S3 Lot 63	18-Apr-2023	LT1	LT1
S4 Lot 8	11-Apr-2023	LT1	LT1
S3 Lot 63	04-Apr-2023	LT1	LT1

BALD MOUNTAIN WATER SYSTEM

Facility Information

Location 175 Ingram Street Duncan

Type 301 - 10,0000 Connections

Facility Sampling History

Location	Date	Total Coliform	E. Coli/Enterococci
S1 Reservoir	28-Mar-2023	QRWRT	QRWRT
S3 Lot 63	20-Mar-2023	LT1	LT1
S4 Lot 8	13-Mar-2023	LT1	LT1
S3 Lot 63	06-Mar-2023	LT1	LT1
S1 Reservoir	01-Mar-2023	LT1	LT1
S1 Reservoir	27-Feb-2023	QRWRT	QRWRT
S4 Lot 8	14-Feb-2023	LT1	LT1
S3 Lot 63	06-Feb-2023	LT1	LT1
S1 Reservoir	30-Jan-2023	LT1	LT1
S3 Lot 63	23-Jan-2023	LT1	LT1
S4 Lot 8	16-Jan-2023	LT1	LT1
S3 Lot 63	09-Jan-2023	LT1	LT1
S1 Reservoir	04-Jan-2023	LT1	LT1

BALD MOUNTAIN WATER

SOURCE - East, Middle and West Wells

DISTRIBUTION - S3

			Sample ID	S5-Lot 69-Well 1 (WTX 27AC4)	S6-Lot 70-Well 2 (WTX 27AC5)	S7-Lot 71-Well 3 (WTX 27AC6)	S3-LOT 63 MARBLE BAY RD (WTX 27AC7)
			Sampling Date	04/12/23	04/12/23	04/12/23	04/27/23
			Sampling Time	09:05 AM	09:18 AM	09:42 AM	08:50 AM
Parameter Name	***MAC***	***AO***	***Units***	***Result***	***Result2***	***Result3***	***Result4***
Nitrite (N)	1		mg/L	<0.0050	0.0083	<0.0050	<0.0050
Nitrate (N)	10		mg/L	4.08	4.77	1.21	4.47
Conductivity			uS/cm	260	260	140	260
pH			pH	7.42	7.24	7.01	7.21
Total Dissolved Solids		500	mg/L	130	150	72	160
Alkalinity (PP as CaCO3)			mg/L	<1.0	<1.0	<1.0	<1.0
Alkalinity (Total as CaCO3)			mg/L	110	98	57	100
Bicarbonate (HCO3)			mg/L	130	120	69	130
Carbonate (CO3)			mg/L	<1.0	<1.0	<1.0	<1.0
Hydroxide (OH)			mg/L	<1.0	<1.0	<1.0	<1.0
Chloride (Cl)		250	mg/L	5.9	7.9	2.2	8.8
Sulphate (SO4)		500	mg/L	1.7	1.2	1.9	1.7
True Colour		15	Col. Unit	<5.0	<5.0	<5.0	<5.0
Nitrate plus Nitrite (N)			mg/L	4.08	4.78	1.21	4.47
Langelier Index (@ 20C)			N/A	-0.377	-0.598	-1.35	-0.632
Langelier Index (@ 4C)			N/A	-0.628	-0.849	-1.6	-0.883
Saturation pH (@ 20C)			N/A	7.8	7.84	8.36	7.84
Saturation pH (@ 4C)			N/A	8.05	8.09	8.61	8.09
Dissolved Fluoride (F)	1.5		mg/L	0.059	<0.050	<0.050	<0.050
Tannins and Lignins			mg/L	<0.2	<0.2	<0.2	<0.2
Turbidity	see remark	see remark	NTU	1.1	1.7	1.7	0.11
Total Hardness (CaCO3)			mg/L	126	120	59.7	117
Total Aluminum (Al)	2900		ug/L	<3.0	<3.0	7.1	<3.0
Total Antimony (Sb)	6		ug/L	<0.50	<0.50	<0.50	<0.50
Total Arsenic (As)	10		ug/L	<0.10	0.17	<0.10	0.13

BALD MOUNTAIN WATER

SOURCE - East, Middle and West Wells

DISTRIBUTION - S3

			Sample ID	S5-Lot 69-Well 1 (WTX 27AC4)	S6-Lot 70-Well 2 (WTX 27AC5)	S7-Lot 71-Well 3 (WTX 27AC6)	S3-LOT 63 MARBLE BAY RD (WTX 27AC7)
			Sampling Date	04/12/23	04/12/23	04/12/23	04/27/23
			Sampling Time	09:05 AM	09:18 AM	09:42 AM	08:50 AM
Parameter Name	***MAC***	***AO***	***Units***	***Result***	***Result2***	***Result3***	***Result4***
Total Barium (Ba)	2000		ug/L	9.8	10	3.4	9.7
Total Beryllium (Be)			ug/L	<0.10	<0.10	<0.10	<0.10
Total Bismuth (Bi)			ug/L	<1.0	<1.0	<1.0	<1.0
Total Boron (B)	5000		ug/L	<50	<50	<50	<50
Total Cadmium (Cd)	7		ug/L	0.061	0.018	0.012	<0.010
Total Chromium (Cr)	50		ug/L	<1.0	<1.0	<1.0	<1.0
Total Cobalt (Co)			ug/L	<0.20	<0.20	<0.20	<0.20
Total Copper (Cu)	2000	1000	ug/L	0.39	1.12	2.14	6.94
Total Iron (Fe)		300	ug/L	230	280	267	10.7
Total Lead (Pb)	5		ug/L	4.45	0.98	<0.20	0.28
Total Manganese (Mn)	120	20	ug/L	13.4	**23.5**	15.9	3.3
Total Molybdenum (Mo)			ug/L	<1.0	<1.0	<1.0	<1.0
Total Nickel (Ni)			ug/L	<1.0	<1.0	<1.0	<1.0
Total Selenium (Se)	50		ug/L	<0.10	<0.10	<0.10	<0.10
Total Silicon (Si)			ug/L	11600	12800	10800	11800
Total Silver (Ag)			ug/L	<0.020	<0.020	<0.020	<0.020
Total Strontium (Sr)	7000		ug/L	107	102	59.1	103
Total Thallium (Tl)			ug/L	<0.010	<0.010	<0.010	<0.010
Total Tin (Sn)			ug/L	<5.0	<5.0	<5.0	<5.0
Total Titanium (Ti)			ug/L	<5.0	<5.0	<5.0	<5.0
Total Uranium (U)	20		ug/L	<0.10	<0.10	<0.10	<0.10
Total Vanadium (V)			ug/L	<5.0	<5.0	<5.0	<5.0
Total Zinc (Zn)		5000	ug/L	43.2	83.2	33.1	10.4
Total Zirconium (Zr)			ug/L	<0.10	<0.10	<0.10	<0.10
Total Calcium (Ca)			mg/L	34.2	34.4	16.2	32.5

BALD MOUNTAIN WATER

SOURCE - East, Middle and West Wells

DISTRIBUTION - S3

			Sample ID	S5-Lot 69-Well 1 (WTX 27AC4)	S6-Lot 70-Well 2 (WTX 27AC5)	S7-Lot 71-Well 3 (WTX 27AC6)	S3-LOT 63 MARBLE BAY RD (WTX 27AC7)
			Sampling Date	04/12/23	04/12/23	04/12/23	04/27/23
			Sampling Time	09:05 AM	09:18 AM	09:42 AM	08:50 AM
Parameter Name	***MAC***	***AO***	***Units***	***Result***	***Result2***	***Result3***	***Result4***
Total Magnesium (Mg)			mg/L	9.89	8.32	4.68	8.57
Total Potassium (K)			mg/L	0.466	0.476	0.39	0.463
Total Sodium (Na)		200	mg/L	4.95	4.62	3.79	5.3
Total Sulphur (S)			mg/L	<3.0	<3.0	<3.0	<3.0
Total Mercury (Hg)	1		ug/L	<0.0019	<0.0019	<0.0019	<0.0019
Total Total Kjeldahl Nitrogen (Calc)			mg/L	<0.10	<0.20	<0.020	<0.10
Total Organic Carbon (C)			mg/L	<0.50	<0.50	<0.50	<0.50
Total Nitrogen (N)			mg/L	3.75	4.44	1.21	4.03
Total Ammonia (N)			mg/L	<0.015	<0.015	<0.015	0.016
Sulphide (as H2S)		0.05	mg/L	<0.0020	<0.0020	<0.0020	<0.0020
Total Sulphide		0.05	mg/L	<0.0018	<0.0018	<0.0018	<0.0018
Total Coliforms	0		CFU/100mL	0	0	0	0
E. coli	0		CFU/100mL	0	0	0	0
Heterotrophic Plate Count			CFU/mL	1	<1	1	<1.0
Fecal Coliforms			CFU/100mL	<1	<1	<1	0
Non-Coliform (Background)			CFU/100mL	<1	<1	<1	<1
Iron Bacteria			CFU/mL	25	<25	<25	<25
Sulphate reducing bacteria			CFU/mL	<75	<75	<75	<75

BALD MOUNTAIN WATER

SOURCE - East, Middle and West Wells

			Sample ID	S6-LOT 70-WELL 2 (WTX 27AC5)	S5-LOT 69-WELL 1 (WTX 27AC4)	S7-LOT 71-WELL 3 (WTX 27AC6)	Well Middle (S6) (WTX 27AC5)	Well East End (S5) (WTX 27AC4)	Well West End (S7) (WTX 27AC6)
			Sampling Date	04/27/23	04/27/23	04/27/23	05/04/23	05/04/23	05/04/23
			Sampling Time	09:45 AM	10:00 AM	10:20 AM	09:35 AM	09:50 AM	10:05 AM
Parameter Name	***MAC***	***AO***	***Units***	***Result5***	***Result6***	***Result7***	***Result8***	***Result9***	***Result10***
Nitrite (N)	1		mg/L	0.0076	<0.0050	<0.0050			
Nitrate (N)	10		mg/L	4.73	3.89	1.18			
Nitrate plus Nitrite (N)			mg/L	4.73	3.89	1.18			
Total Hardness (CaCO3)			mg/L	114	112	59			
Total Aluminum (Al)	2900		ug/L	<3.0	<3.0	4.3			
Total Antimony (Sb)	6		ug/L	<0.50	<0.50	<0.50			
Total Arsenic (As)	10		ug/L	0.19	0.11	<0.10			
Total Barium (Ba)	2000		ug/L	9.9	9.1	3.5			
Total Beryllium (Be)			ug/L	<0.10	<0.10	<0.10			
Total Bismuth (Bi)			ug/L	<1.0	<1.0	<1.0			
Total Boron (B)	5000		ug/L	<50	<50	<50			
Total Cadmium (Cd)	7		ug/L	0.012	0.144	0.01			
Total Chromium (Cr)	50		ug/L	<1.0	<1.0	<1.0			
Total Cobalt (Co)			ug/L	<0.20	<0.20	<0.20			
Total Copper (Cu)	2000	1000	ug/L	0.84	4.66	0.95			
Total Iron (Fe)		300	ug/L	64.4	251	186			
Total Lead (Pb)	5		ug/L	0.7	**29.4**	0.74	0.8	0.99	1.12
Total Manganese (Mn)	120	20	ug/L	**21.2**	10.9	15.1			
Total Molybdenum (Mo)			ug/L	<1.0	<1.0	<1.0			
Total Nickel (Ni)			ug/L	<1.0	<1.0	<1.0			
Total Selenium (Se)	50		ug/L	<0.10	<0.10	<0.10			
Total Silicon (Si)			ug/L	12100	10900	10500			
Total Silver (Ag)			ug/L	<0.020	<0.020	<0.020			
Total Strontium (Sr)	7000		ug/L	102	98.9	59.2			
Total Thallium (Tl)			ug/L	<0.010	<0.010	<0.010			
Total Tin (Sn)			ug/L	<5.0	<5.0	<5.0			
Total Titanium (Ti)			ug/L	<5.0	<5.0	<5.0			
Total Uranium (U)	20		ug/L	<0.10	<0.10	<0.10			
Total Vanadium (V)			ug/L	<5.0	<5.0	<5.0			
Total Zinc (Zn)		5000	ug/L	50.2	60.1	41.5			
Total Zirconium (Zr)			ug/L	<0.10	<0.10	<0.10			
Total Calcium (Ca)			mg/L	32.2	30.4	15.9			
Total Magnesium (Mg)			mg/L	8.21	8.77	4.67			
Total Potassium (K)			mg/L	0.477	0.436	0.382			
Total Sodium (Na)		200	mg/L	4.49	4.46	3.64			
Total Sulphur (S)			mg/L	<3.0	<3.0	<3.0			
Total Mercury (Hg)	1		ug/L	<0.0019	<0.0019	<0.0019			