REGIONAL DISTRICT OF NANAIMO

Tippet Road (new in 2020) Raw Well Water Analysis
2275 Tippet 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		Febuary 25 2021	October 28 2021	October 20 2022	October 26 2023	January 30 2025
Miscellaneous Inorganics								
Fluoride	mg/L	1.5	MAC	0.15	0.16	0.17	0.16	0.15
Alkalinity (total as CaCO)	mg/L			170	150	150	150	150
Anions								
Dissolved Sulphate	mg/L	500	AO	6.8	9.1	11	11	8.3
Dissolved Chloride	mg/L	250	AO	12	10	9.1	7.8	8.4
Nitrite	mg/L	1	MAC	<0.005	<0.005	<0.005	<0.05	<0.05
Miscellaneous								
Apparent Colour	Colour Unit			15	10	10	10	21
Nutrients								
Total Ammonia	mg/L			1.3	1.2	1.3	1.3	1.3
Physical Properties								
Conductivity	µS/cm			330	330	340	340	340
pH	pH	7.0:10.5	AO	7.07	7.83	8.05	8.19	8.06
TDS	mg/L	500	AO	170	220	180	200	190
Turbidity	NTU			0.6	0.93	1.1	1.1	1.4
Microbiological Parameters								
E.coli	MPN/100mL	<1	MAC	0	0	0	0	0
Total Coliforms	MPN/100mL	<1	MAC	1	0	0	0	0
Calculated Parameters								
Total Hardness (CaCO)	mg/L			97.9	118	125	131	132
Nitrate	mg/L	10	MAC	<0.02	<0.02	<0.02	<0.02	<0.02
Elements								
Total Mercury	mg/L	0.001	MAC	<0.0000019	<0.0000019	<0.0000019	<0.0000019	<0.0000019
Total Metals								
Total Aluminum	mg/L	0.1	OG	<0.003	<0.003	<0.003	<0.006	0.016
Total Antimony	mg/L	0.006	MAC	<0.0005	<0.0005	<0.0005	<0.001	<0.0005
Total Arsenic	mg/L	0.01	MAC	0.00362	0.00157	0.00147	0.00117	0.001
Total Barium	mg/L	1	MAC	0.0095	0.0093	0.0095	0.0095	0.0092
Total Beryllium	mg/L			<0.0001	<0.0001	<0.0001	<0.0002	<0.0001
Total Bismuth	mg/L			<0.001	<0.001	<0.001	<0.002	<0.001
Total Boron	mg/L	5	MAC	0.073	0.054	0.055	<0.1	0.06
Total Cadmium	mg/L	0.005	MAC	<0.00001	<0.00001	<0.00001	<0.00002	<0.00001
Total Chromium	mg/L	0.05	MAC	<0.001	<0.001	<0.001	<0.002	<0.001
Total Cobalt	mg/L			<0.0002	<0.0002	0.00074	<0.0004	<0.0002
Total Copper	mg/L	2	AO	0.00078	0.00319	0.00253	0.00059	0.00028
Total Iron	mg/L	0.1	AO	**0.317**	**0.543**	**0.575**	**0.606**	**0.605**
Total Lead	mg/L	0.05	MAC	<0.0002	<0.0002	<0.0002	<0.0004	<0.0002
Total Manganese	mg/L	0.02 0.12	AO MAC	**0.227**	**0.256**	**0.272**	**0.291**	**0.279**
Total Molybdenum	mg/L			<0.001	<0.001	<0.001	<0.002	<0.001
Total Nickel	mg/L			<0.001	<0.001	<0.001	<0.002	<0.001
Total Selenium	mg/L	0.05	MAC	<0.0001	<0.0001	<0.0001	<0.0002	0.00065
Total Silicon	mg/L			14.2	15.4	16.5	16.3	16.2
Total Silver	mg/L			<0.00002	<0.00002	<0.00002	<0.00004	<0.00002
Total Strontium	mg/L			0.092	0.106	0.112	0.108	0.111
Total Thallium	mg/L			<0.00001	<0.00001	<0.00001	<0.00002	<0.00001
Total Tin	mg/L			<0.005	<0.005	<0.005	<0.01	<0.005
Total Titanium	mg/L			<0.005	<0.005	<0.005	<0.01	<0.005
Total Uranium	mg/L	0.02	MAC	<0.0001	<0.0001	<0.0001	<0.0002	<0.0001
Total Vanadium	mg/L			<0.005	<0.005	<0.005	<0.01	<0.005
Total Zinc	mg/L	5	AO	<0.005	0.0053	0.0052	<0.01	<0.005
Total Zirconium	mg/L			<0.0001	<0.0001	<0.0001	<0.0002	<0.0001
Total Calcium	mg/L			22.6	28.8	30.8	31.7	32.7
Total Magnesium	mg/L			10.1	11.3	11.8	12.6	12.2
Total Potassium	mg/L			2.61	2.46	2.54	2.59	2.49
Total Sodium	mg/L	200	AO	23.4	18	19.5	19.9	18.3
Total Sulphur	mg/L			<3	<3	3.6	<6	3.5

Notes below about Iron and Manganese from: https://www.canada.ca/en/health-canada/services/environmental-workplace-health/reports-publications/water-quality/guidelines-canadian-drinking-water-quality-summary-table.html#t2

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.
I = Inorganic chemical parameter	Iron (2024)	None	AO: ≤0.1	Naturally occurring (erosion and weathering of rocks and minerals due to geological processes); Released from iron-based drinking water materials or as iron corrosion by-products and in water treatment processes. Human activities such as mine drainage water, acid mine effluents and agricultural runoff.	A guideline value is not necessary as health effects are not of concern at levels found in drinking water and at the level at which the AO is set.	AO is for total iron and is based on minimizing the occurrence of discoloured water and to improve consumer confidence in drinking water quality. Removal of iron also improves the removal of manganese, reducing the health risk associated with this metal.

REGIONAL DISTRICT OF NANAIMO

Fairwinds #1 Raw Well Water Analysis
2275 Tippet Road
(well water has been sent to the WTP since 2012)

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 26 2015	October 26 2016	September 21 2017	November 6 2018	October 24 2019
Miscellaneous Inorganics								
Fluoride	mg/L	1.5	MAC	0.16	0.14	0.16	0.16	0.17
Alkalinity (total as CaCO)	mg/L			146	152	158	151	150
Anions								
Dissolved Sulphate	mg/L	500	AO	9.38	11.8	13.3	12.9	12
Dissolved Chloride	mg/L	250	AO	10	10	10	9.8	11
Nitrite	mg/L	1	MAC	<0.0050	<0.0050	<0.0050	<0.0050	<0.005
Miscellaneous								
Apparent Colour	Colour Unit			30	20	20	15	15
Nutrients								
Total Ammonia	mg/L			1.3	1.4	1.3	1.3	1.2
Physical Properties								
Conductivity	µS/cm			331	343	345	346	340
pH	pH	7.0:10.5	AO	8.29	8.13	8.23	8.11	8.09
TDS	mg/L	500	AO	208	204	196	188	200
Turbidity	NTU			1	1.04	1.18	1.15	1.2
Microbiological Parameters								
E.coli	MPN/100mL	<1	MAC	<1.0	<1.0	<1.0	<1.0	0
Total Coliforms	MPN/100mL	<1	MAC	<1.0	<1.0	<1.0	<1.0	0
Calculated Parameters								
Total Hardness (CaCO)	mg/L			122	120	125	128	123
Nitrate	mg/L	10	MAC	<0.020	<0.020	<0.020	<0.020	<0.02
Elements								
Total Mercury	mg/L	0.001	MAC	<0.00001	<0.00001	<0.00001	<0.000002	<0.000002
Total Metals								
Total Aluminum	mg/L	0.1	OG	<0.003	<0.003	<0.003	0.0062	<0.003
Total Antimony	mg/L	0.006	MAC	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Total Arsenic	mg/L	0.01	MAC	0.0018	0.00174	0.00156	0.00166	0.00139
Total Barium	mg/L	1	MAC	0.0103	0.0109	0.0104	0.0102	0.0103
Total Beryllium	mg/L			<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Total Bismuth	mg/L			<0.001	<0.001	<0.001	<0.001	<0.001
Total Boron	mg/L	5	MAC	0.061	0.059	0.070	0.063	0.06
Total Cadmium	mg/L	0.005	MAC	<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
Total Cobalt	mg/L			<0.0005	<0.0005	<0.0002	<0.0002	<0.0002
Total Copper	mg/L	1	AO	0.00077	0.00022	<0.0002	0.00038	<0.0002
Total Iron	mg/L	0.1	AO	**0.647**	**0.632**	**0.659**	**0.649**	**0.663**
Total Lead	mg/L	0.01	MAC	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Total Manganese	mg/L	0.02 0.12	AO MAC	**0.265**	**0.275**	**0.278**	**0.282**	**0.287**
Total Molybdenum	mg/L			<0.001	<0.001	<0.001	<0.001	<0.001
Total Nickel	mg/L			<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	0.00162
Total Silicon	mg/L			17	15.5	15.9	15.3	14.6
Total Silver	mg/L			<0.00002	<0.00002	<0.00002	<0.00002	<0.00002
Total Strontium	mg/L			0.0971	0.108	0.105	0.11	0.108
Total Thallium	mg/L			<0.00005	<0.00005	<0.00001	<0.00001	<0.00001
Total Tin	mg/L			<0.005	<0.005	<0.005	<0.005	<0.005
Total Titanium	mg/L			<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
Total Vanadium	mg/L			<0.005	<0.005	<0.005	<0.005	<0.005
Total Zinc	mg/L	5	AO	<0.005	0.025	<0.005	0.0055	<0.005
Total Zirconium	mg/L			<0.0005	<0.0005	<0.0001	<0.0001	<0.0001
Total Calcium	mg/L			30.4	29.5	30.1	31.3	30.6
Total Magnesium	mg/L			11.2	11.3	12.1	12.1	11.4
Total Potassium	mg/L			2.5	2.44	2.71	2.43	2.5
Total Sodium	mg/L	200	AO	22.4	20.2	21.6	21.6	20.5
Total Sulphur	mg/L			<3.0	4	5.3	4.3	4.4

Notes below about Iron and Manganese from: https://www.canada.ca/en/health-canada/services/environmental-workplace-health/reports-publications/water-quality/guidelines-canadian-drinking-water-quality-summary-table.html#t2

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.
I = Inorganic chemical parameter	Iron (2024)	None	AO: ≤0.1	Naturally occurring (erosion and weathering of rocks and minerals due to geological processes); Released from iron-based drinking water materials or as iron corrosion by-products and in water treatment processes. Human activities such as mine drainage water, acid mine effluents and agricultural runoff.	A guideline value is not necessary as health effects are not of concern at levels found in drinking water and at the level at which the AO is set.	AO is for total iron and is based on minimizing the occurrence of discoloured water and to improve consumer confidence in drinking water quality. Removal of iron also improves the removal of manganese, reducing the health risk associated with this metal.

REGIONAL DISTRICT OF NANAIMO

Fairwinds #2 Raw Well Water Analysis
2395 Nanoose Road
(well water has been sent to the WTP since 2012)

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 26 2016	September 21 2017	November 6 2018	October 24 2019	November 5 2020
Miscellaneous Inorganics								
Fluoride	mg/L	1.5	MAC	0.19	0.19	0.19	0.23	0.18
Alkalinity (total as CaCO)	mg/L			144	153	145	140	150
Anions								
Dissolved Sulphate	mg/L	500	AO	12.4	14.6	14.1	18	21
Dissolved Chloride	mg/L	250	AO	13	13	12	13	10
Nitrite	mg/L	1	MAC	<0.0050	<0.0050	<0.0050	<0.005	<0.005
Miscellaneous								
Apparent Colour	Colour Unit			20	20	20	20	20
Nutrients								
Total Ammonia	mg/L			1.7	1.6	1.5	1.6	1.8
Physical Properties								
Conductivity	µS/cm			349	343	341	350	360
pH	pH	7.0:10.5	AO	8.09	8.22	8.13	8.06	8.25
TDS	mg/L	500	AO	196	206	174	210	220
Turbidity	NTU			0.68	0.64	0.71	1.2	0.85
Microbiological Parameters								
E.coli	MPN/100mL	<1	MAC	<1.0	<1.0	<1.0	0	0
Total Coliforms	MPN/100mL	<1	MAC	<1.0	<1.0	<1.0	0	0
Calculated Parameters								
Total Hardness (CaCO)	mg/L			110	112	109	110	115
Nitrate	mg/L	10	MAC	<0.020	<0.0020	<0.020	<0.02	<0.002
Elements								
Total Mercury	mg/L	0.001	MAC	<0.00001	<0.00001	<0.000002	<0.000002	<0.0000019
Total Metals								
Total Aluminum	mg/L	0.1	OG	<0.003	<0.003	0.0032	<0.003	<0.003
Total Antimony	mg/L	0.006	MAC	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Total Arsenic	mg/L	0.01	MAC	0.00121	0.00146	0.00127	0.00135	0.00124
Total Barium	mg/L	1	MAC	0.0077	0.0073	0.0074	0.0079	0.0075
Total Beryllium	mg/L			<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Total Bismuth	mg/L			<0.001	<0.001	<0.001	<0.001	<0.001
Total Boron	mg/L	5	MAC	0.079	0.088	0.084	0.079	0.074
Total Cadmium	mg/L	0.005	MAC	<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
Total Cobalt	mg/L			<0.0005	<0.0002	<0.0002	<0.0002	<0.0002
Total Copper	mg/L	1	AO	0.00042	0.00115	0.00057	0.00043	<0.0002
Total Iron	mg/L	0.1	AO	**0.576**	**0.513**	**0.56**	**0.677**	**0.618**
Total Lead	mg/L	0.01	MAC	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Total Manganese	mg/L	0.02 0.12	AO MAC	**0.282**	**0.292**	**0.295**	**0.326**	**0.296**
Total Molybdenum	mg/L			<0.001	<0.001	<0.001	<0.001	<0.001
Total Nickel	mg/L			<0.001	<0.001	<0.001	<0.001	<0.001
Total Selenium	mg/L	0.05	MAC	<0.0001	<0.0001	<0.0001	0.00059	0.00082
Total Silicon	mg/L			15	17.9	16	15	14.6
Total Silver	mg/L			<0.00002	<0.00002	<0.00002	<0.00002	<0.00002
Total Strontium	mg/L			0.104	0.108	0.108	0.114	0.11
Total Thallium	mg/L			<0.00005	<0.00001	<0.00001	<0.00001	<0.00001
Total Tin	mg/L			<0.005	<0.005	<0.005	<0.005	<0.005
Total Titanium	mg/L			<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
Total Vanadium	mg/L			<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
Total Zirconium	mg/L			<0.0005	<0.0001	<0.0001	<0.0001	<0.0001
Total Calcium	mg/L			27.1	27.6	26.4	27.4	28.2
Total Magnesium	mg/L			10.3	10.4	10.5	10.2	10.9
Total Potassium	mg/L			2.61	2.99	2.79	2.9	2.75
Total Sodium	mg/L	200	AO	29	28.5	28.8	26.8	24.9
Total Sulphur	mg/L			4.5	5.8	4.8	6.1	6.4

Notes below about Iron and Manganese from: https://www.canada.ca/en/health-canada/services/environmental-workplace-health/reports-publications/water-quality/guidelines-canadian-drinking-water-quality-summary-table.html#t2

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.
I = Inorganic chemical parameter	Iron (2024)	None	AO: ≤0.1	Naturally occurring (erosion and weathering of rocks and minerals due to geological processes); Released from iron-based drinking water materials or as iron corrosion by-products and in water treatment processes. Human activities such as mine drainage water, acid mine effluents and agricultural runoff.	A guideline value is not necessary as health effects are not of concern at levels found in drinking water and at the level at which the AO is set.	AO is for total iron and is based on minimizing the occurrence of discoloured water and to improve consumer confidence in drinking water quality. Removal of iron also improves the removal of manganese, reducing the health risk associated with this metal.

REGIONAL DISTRICT OF NANAIMO

West Bay #5 Raw Well Water Analysis
2391 Nanoose Road
(drilled in 2024, online in 2025, goes to WTP)

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		July 9 2024					
Miscellaneous Inorganics									
Fluoride	mg/L	1.5	MAC	0.17					
Alkalinity (total as CaCO)	mg/L			140					
Anions									
Dissolved Sulphate	mg/L	500	AO	29					
Dissolved Chloride	mg/L	250	AO	11					
Nitrite	mg/L	1	MAC	<0.0050					
Miscellaneous									
Apparent Colour	Colour Unit			13.9					
Nutrients									
Total Ammonia	mg/L			1.7					
Physical Properties									
Conductivity	µS/cm			380					
pH	pH	7.0:10.5	AO	7.98					
TDS	mg/L	500	AO	230					
Turbidity	NTU			0.69					
Microbiological Parameters									
E.coli	MPN/100mL	<1	MAC	0					
Total Coliforms	MPN/100mL	<1	MAC	0					
Calculated Parameters									
Total Hardness (CaCO)	mg/L			109					
Nitrate	mg/L	10	MAC	<0.020					
Elements									
Total Mercury	mg/L	0.001	MAC	<0.0019					
Total Metals									
Total Aluminum	mg/L	0.1	OG	0.0213					
Total Antimony	mg/L	0.006	MAC	<0.0005					
Total Arsenic	mg/L	0.01	MAC	0.0092					
Total Barium	mg/L	1	MAC	0.0083					
Total Beryllium	mg/L			<0.0001					
Total Bismuth	mg/L			<0.001					
Total Boron	mg/L	5	MAC	0.09					
Total Cadmium	mg/L	0.005	MAC	0.000014					
Total Chromium	mg/L	0.05	MAC	<0.001					
Total Cobalt	mg/L			<0.0002					
Total Copper	mg/L	2	AO	0.00052					
Total Iron	mg/L	0.1	AO	**0.31**					
Total Lead	mg/L	0.05	MAC	<0.0002					
Total Manganese	mg/L	0.02 0.12	AO MAC	**0.272**					
Total Molybdenum	mg/L			<0.001					
Total Nickel	mg/L			<0.001					
Total Selenium	mg/L	0.05	MAC	<0.0001					
Total Silicon	mg/L			17					
Total Silver	mg/L			<0.00002					
Total Strontium	mg/L			0.105					
Total Thallium	mg/L			<0.00001					
Total Tin	mg/L			<0.005					
Total Titanium	mg/L			<0.005					
Total Uranium	mg/L	0.02	MAC	<0.0001					
Total Vanadium	mg/L			<0.005					
Total Zinc	mg/L	5	AO	0.0151					
Total Zirconium	mg/L			<0.0001					
Total Calcium	mg/L			26.4					
Total Magnesium	mg/L			10.6					
Total Potassium	mg/L			3.13					
Total Sodium	mg/L	200	AO	29.4					
Total Sulphur	mg/L			9.8					

Notes below about Iron and Manganese from: https://www.canada.ca/en/health-canada/services/environmental-workplace-health/reports-publications/water-quality/guidelines-canadian-drinking-water-quality-summary-table.html#t2

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.
I = Inorganic chemical parameter	Iron (2024)	None	AO: ≤0.1	Naturally occurring (erosion and weathering of rocks and minerals due to geological processes); Released from iron-based drinking water materials or as iron corrosion by-products and in water treatment processes. Human activities such as mine drainage water, acid mine effluents and agricultural runoff.	A guideline value is not necessary as health effects are not of concern at levels found in drinking water and at the level at which the AO is set.	AO is for total iron and is based on minimizing the occurrence of discoloured water and to improve consumer confidence in drinking water quality. Removal of iron also improves the removal of manganese, reducing the health risk associated with this metal.

REGIONAL DISTRICT OF NANAIMO

Fairwinds #3 Raw Well Water Analysis
2301 Nanoose Road
(well water has been sent to the WTP since 2012)

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 26 2016	September 21 2017	November 6 2018	October 24 2019	November 5 2020	October 28 2021	October 20 2022	October 26 2023	January 30 2025
Miscellaneous Inorganics												
Fluoride	mg/L	1.5	MAC	0.12	0.13	0.14	0.15	0.13	0.14	0.14	0.14	0.12
Alkalinity (total as CaCO)	mg/L			152	164	156	150	160	160	160	140	150
Anions												
Dissolved Sulphate	mg/L	500	AO	11	13.6	11.3	12	12	14	14	13	9.6
Dissolved Chloride	mg/L	250	AO	61	52	47	57	49	51	44	47	70
Nitrite	mg/L	1	MAC	<0.0050	<0.0050	<0.0050	<0.005	<0.005	<0.005	<0.005	<0.005	<0.05
Miscellaneous												
Apparent Colour	Colour Unit			30	20	20	20	15	10	15	15	24
Nutrients												
Total Ammonia	mg/L			1.9	1.8	1.7	1.7	1.9	1.7	1.7	1.9	1.9
Physical Properties												
Conductivity	µS/cm			512	488	477	470	480	480	480	490	540
pH	pH	7.0:10.5	AO	8.14	8.23	8.06	8.08	8.26	7.84	8.05	8.17	7.95
TDS	mg/L	500	AO	284	276	252	250	270	280	250	300	280
Turbidity	NTU			1.11	1.02	0.77	1.2	0.86	0.89	1	1.2	1.6
Microbiological Parameters												
E.coli	MPN/100mL	<1	MAC	<1.0	<1.0	<1.0	0	0	0	0	0	0
Total Coliforms	MPN/100mL	<1	MAC	<1.0	<1.0	<1.0	0	0	0	0	0	0
Calculated Parameters												
Total Hardness (CaCO)	mg/L			149	144	135	138	134	136	141	150	164
Nitrate	mg/L	10	MAC	<0.020	<0.020	<0.020	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Elements												
Total Mercury	mg/L	0.001	MAC	<0.00001	<0.00001	<0.000002	<0.000002	<0.0000019	<0.0000019	<0.0000019	<0.0000019	<0.0000019
Total Metals												
Total Aluminum	mg/L	0.1	OG	<0.003	<0.003	<0.0030	<0.003	<0.003	<0.003	<0.003	<0.006	<0.003
Total Antimony	mg/L	0.006	MAC	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.001	<0.0005
Total Arsenic	mg/L	0.01	MAC	0.00395	0.00379	0.0038	0.00365	0.00344	0.00358	0.00329	0.00336	0.00304
Total Barium	mg/L	1	MAC	0.0095	0.0099	0.0091	0.0089	0.0086	0.009	0.0087	0.0095	0.0103
Total Beryllium	mg/L			<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0002	<0.0001
Total Bismuth	mg/L			<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.002	<0.001
Total Boron	mg/L	5	MAC	0.077	0.090	0.073	0.074	0.073	0.072	0.086	<0.1	0.077
Total Cadmium	mg/L	0.005	MAC	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00002	<0.00001
Total Chromium	mg/L	0.05	MAC	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.02	<0.001
Total Cobalt	mg/L			<0.0005	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0004	<0.0002
Total Copper	mg/L	1	AO	0.00035	<0.0002	0.00153	<0.0002	0.0002	0.0002	0.0005	0.00057	0.00522
Total Iron	mg/L	0.1	AO	**0.561**	**0.556**	**0.513**	**0.526**	**0.52**	**0.511**	**0.517**	**0.554**	**0.557**
Total Lead	mg/L	0.01	MAC	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0004	0.00336
Total Manganese	mg/L	0.02 0.12	AO MAC	**0.231**	**0.230**	**0.225**	**0.247**	**0.288**	**0.237**	**0.235**	**0.272**	**0.277**
Total Molybdenum	mg/L			<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.002	<0.001
Total Nickel	mg/L			<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.002	<0.001
Total Selenium	mg/L	0.05	MAC	<0.0001	<0.0001	<0.0001	<0.0001	0.00164	<0.0001	0.00048	0.00066	0.00246
Total Silicon	mg/L			14.5	16.8	14.8	14.6	13.5	15.9	17.9	17	16.4
Total Silver	mg/L			<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.00004	<0.00002
Total Strontium	mg/L			0.221	0.224	0.218	0.214	0.202	0.221	0.209	0.236	0.247
Total Thallium	mg/L			<0.00005	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00002	<0.00001
Total Tin	mg/L			<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.01	<0.005
Total Titanium	mg/L			<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.01	<0.005
Total Uranium	mg/L	0.02	MAC	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0002	<0.0001
Total Vanadium	mg/L			<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.01	<0.005
Total Zinc	mg/L	5	AO	<0.005	<0.005	0.005	<0.005	<0.005	<0.005	0.0057	<0.01	0.0079
Total Zirconium	mg/L			<0.0005	<0.0001	<0.0001	<0.0001	<0.0001	0.0001	<0.0001	<0.0002	<0.0001
Total Calcium	mg/L			37.1	35.6	33.7	34.9	32.6	33.4	35.3	36.4	41.2
Total Magnesium	mg/L			13.7	13.4	12.3	12.4	12.7	12.7	13	14.2	14.9
Total Potassium	mg/L			3.31	3.7	3.45	3.48	3.36	3.51	3.25	3.74	3.7
Total Sodium	mg/L	200	AO	42.2	39.5	37	36.3	36	35.2	36.5	38.4	36.7
Total Sulphur	mg/L			4.1	6.6	3.8	5.7	3.8	4.9	5.3	6.6	6.1

Notes below about Iron and Manganese from: https://www.canada.ca/en/health-canada/services/environmental-workplace-health/reports-publications/water-quality/guidelines-canadian-drinking-water-quality-summary-table.html#t2

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.
I = Inorganic chemical parameter	Iron (2024)	None	AO: ≤0.1	Naturally occurring (erosion and weathering of rocks and minerals due to geological processes); Released from iron-based drinking water materials or as iron corrosion by-products and in water treatment processes. Human activities such as mine drainage water, acid mine effluents and agricultural runoff.	A guideline value is not necessary as health effects are not of concern at levels found in drinking water and at the level at which the AO is set.	AO is for total iron and is based on minimizing the occurrence of discoloured water and to improve consumer confidence in drinking water quality. Removal of iron also improves the removal of manganese, reducing the health risk associated with this metal.

REGIONAL DISTRICT OF NANAIMO

West Bay #4 Raw Well Water Analysis
2473 Nanoose Road
(well water has been sent to the WTP since 2012)

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 24 2019	November 5 2020	October 28 2021	October 20 2022	October 26 2023	January 30 2025
Miscellaneous Inorganics									
Fluoride	mg/L	1.5	MAC	0.18	0.15	0.16	0.17	0.17	0.15
Alkalinity (total as CaCO)	mg/L			140	140	140	140	130	140
Anions									
Dissolved Sulphate	mg/L	500	AO	6.5	8.2	9.8	9	9.3	10
Dissolved Chloride	mg/L	250	AO	8.2	8.5	8.7	7.6	7.6	8.9
Nitrite	mg/L	1	MAC	<0.005	<0.005	<0.005	<0.05	<0.05	<0.05
Miscellaneous									
Apparent Colour	Colour Unit			20	15	15	10	10	22
Nutrients									
Total Ammonia	mg/L			1.1	1.2	1.1	1.2	1.2	1.2
Physical Properties									
Conductivity	µS/cm			300	310	310	310	320	320
pH	pH	7.0:10.5	AO	8.05	8.25	7.8	7.99	8.15	8.04
TDS	mg/L	500	AO	170	170	210	170	190	180
Turbidity	NTU			0.73	0.7	0.64	0.74	0.94	1
Microbiological Parameters									
E.coli	MPN/100mL	<1	MAC	0	0	0	0	0	0
Total Coliforms	MPN/100mL	<1	MAC	0	0	0	0	0	0
Calculated Parameters									
Total Hardness (CaCO)	mg/L			107	107	106	112	113	104
Nitrate	mg/L	10	MAC	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Elements									
Total Mercury	mg/L	0.001	MAC	<0.000002	<0.0000019	<0.0000019	0.0000034	<0.0000019	<0.0000019
Total Metals									
Total Aluminum	mg/L	0.1	OG	<0.003	<0.003	<0.003	<0.003	<0.006	<0.003
Total Antimony	mg/L	0.006	MAC	<0.0005	<0.0005	<0.0005	<0.0005	<0.001	<0.0005
Total Arsenic	mg/L	0.01	MAC	0.00043	0.00042	0.00047	0.00051	0.00042	0.00039
Total Barium	mg/L	1	MAC	0.006	0.0058	0.006	0.0063	0.006	0.0058
Total Beryllium	mg/L			<0.0001	<0.0001	<0.0001	<0.0001	<0.0002	<0.0001
Total Bismuth	mg/L			<0.001	<0.001	<0.001	<0.001	<0.002	<0.001
Total Boron	mg/L	5	MAC	0.062	0.061	0.059	0.061	<0.10	0.064
Total Cadmium	mg/L	0.005	MAC	<0.00001	<0.00001	<0.00001	<0.00001	<0.00002	<0.00001
Total Chromium	mg/L	0.05	MAC	0.0011	<0.001	<0.001	<0.001	<0.002	<0.001
Total Cobalt	mg/L			<0.0002	<0.0002	<0.0002	0.00035	<0.0004	<0.0002
Total Copper	mg/L	2	AO	0.00991	0.00203	0.00131	0.0203	0.00271	0.0026
Total Iron	mg/L	0.1	AO	**0.569**	**0.548**	**0.518**	**0.552**	**0.541**	**0.531**
Total Lead	mg/L	0.05	MAC	<0.0002	<0.0002	<0.0002	<0.0002	<0.0004	0.00066
Total Manganese	mg/L	0.02 0.12	AO MAC	**0.218**	**0.191**	**0.191**	**0.205**	**0.199**	**0.187**
Total Molybdenum	mg/L			<0.001	<0.001	<0.001	<0.001	<0.002	<0.001
Total Nickel	mg/L			<0.001	<0.001	<0.001	<0.001	<0.002	<0.001
Total Selenium	mg/L	0.05	MAC	0.00079	0.00023	<0.0001	<0.0001	<0.0002	0.00076
Total Silicon	mg/L			13.1	12.8	14.5	15.9	15.3	13.3
Total Silver	mg/L			<0.00002	<0.00002	<0.00002	<0.00002	<0.00004	<0.00002
Total Strontium	mg/L			0.103	0.0987	0.104	0.109	0.103	0.101
Total Thallium	mg/L			<0.00001	<0.00001	<0.00001	<0.00001	<0.00002	<0.00001
Total Tin	mg/L			<0.005	<0.005	<0.005	<0.005	<0.01	<0.005
Total Titanium	mg/L			<0.005	<0.005	<0.005	<0.005	<0.01	<0.005
Total Uranium	mg/L	0.02	MAC	<0.0001	<0.0001	<0.0001	<0.0001	<0.0002	<0.0001
Total Vanadium	mg/L			<0.005	<0.005	<0.005	<0.005	<0.01	<0.005
Total Zinc	mg/L	5	AO	<0.005	<0.005	0.0102	0.0062	<0.01	0.0051
Total Zirconium	mg/L			<0.0001	<0.0001	<0.0001	<0.0001	<0.0002	<0.0001
Total Calcium	mg/L			27.1	26.8	26.3	28	36.4	26.4
Total Magnesium	mg/L			9.64	9.8	9.67	10.3	14.2	9.26
Total Potassium	mg/L			2.44	2.26	2.36	2.45	3.74	2.06
Total Sodium	mg/L	200	AO	18.7	18	17.5	18.9	38.4	16.1
Total Sulphur	mg/L			<3	<3	3.2	<3	6.6	3.1

Notes below about Iron and Manganese from: https://www.canada.ca/en/health-canada/services/environmental-workplace-health/reports-publications/water-quality/guidelines-canadian-drinking-water-quality-summary-table.html#t2

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.
I = Inorganic chemical parameter	Iron (2024)	None	AO: ≤0.1	Naturally occurring (erosion and weathering of rocks and minerals due to geological processes); Released from iron-based drinking water materials or as iron corrosion by-products and in water treatment processes. Human activities such as mine drainage water, acid mine effluents and agricultural runoff.	A guideline value is not necessary as health effects are not of concern at levels found in drinking water and at the level at which the AO is set.	AO is for total iron and is based on minimizing the occurrence of discoloured water and to improve consumer confidence in drinking water quality. Removal of iron also improves the removal of manganese, reducing the health risk associated with this metal.

REGIONAL DISTRICT OF NANAIMO

NB Peninsula WTP Blended Well Water Analysis
2480 Nanoose Road
(raw well water, before treatment process)

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 26 2016	September 21 2017	Nov. 6 2018	October 24 2019	November 5 2020	October 14 2021	October 20 2022	October 26 2023	January 30 2025
Miscellaneous Inorganics												
Fluoride	mg/L	1.5	MAC	0.16	0.16	0.16	0.18	0.15	0.16	0.16	0.16	0.14
Alkalinity (total as CaCO)	mg/L			142	148	146	140	150	150	150	140	150
Anions												
Dissolved Sulphate	mg/L	500	AO	8.13	9.4	11.4	9.3	11	11	10	11	9.3
Dissolved Chloride	mg/L	250	AO	15	16	19	17	17	16	21	16	20
Nitrite	mg/L	1	MAC	<0.0050	<0.0050	<0.0050	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Miscellaneous												
Apparent Colour	Colour Unit			20	20	15	20	15	<5	10	10	24
Nutrients												
Total Ammonia	mg/L			1.5	1.3	1.4	1.5	1.4	1.3	1.1	1.2	1.4
Physical Properties												
Conductivity	µS/cm			344	342	363	340	350	350	370	360	370
pH	pH	7.0:10.5	AO	8.14	8	8.03	8.05	8.27	8.21	8.03	8.16	8.04
TDS	mg/L	500	AO	192	190	198	180	200	210	210	230	190
Turbidity	NTU			0.96	1.35	0.88	0.88	0.67	0.84	1.6	1.3	1.2
Microbiological Parameters												
E.coli	MPN/100mL	<1	MAC	<1.0	<1.0	<1.0	0	0	0	0	0	0
Total Coliforms	MPN/100mL	<1	MAC	<1.0	<1.0	<1.0	0	0	0	0	0	0
Calculated Parameters												
Total Hardness (CaCO)	mg/L			118	118	121	119	114	124	122	124	132
Nitrate	mg/L	10	MAC	<0.020	<0.020	<0.020	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Elements												
Total Mercury	mg/L	0.001	MAC	<0.00001	<0.00001	<0.000002	<0.000002	<0.0000019	<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	<0.003	<0.006	<0.003
Total Antimony	mg/L	0.006	MAC	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.001	<0.0005
Total Arsenic	mg/L	0.01	MAC	0.00129	0.00137	0.00178	0.00124	0.00113	0.00144	0.00149	0.00124	0.00108
Total Barium	mg/L	1	MAC	0.0076	0.0082	0.0087	0.0074	0.0064	0.0079	0.0087	0.0079	0.0086
Total Beryllium	mg/L			<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0002	<0.0001
Total Bismuth	mg/L			<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.002	<0.001
Total Boron	mg/L	5	MAC	0.065	0.074	0.067	0.065	0.068	0.064	0.06	<0.10	0.066
Total Cadmium	mg/L	0.005	MAC	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00002	<0.00001
Total Chromium	mg/L	0.05	MAC	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.002	<0.001
Total Cobalt	mg/L			<0.0005	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0004	<0.0002
Total Copper	mg/L	1	AO	0.00029	0.001	<0.0005	<0.0002	0.00024	<0.0002	0.00124	<0.0004	0.00022
Total Iron	mg/L	0.1	AO	**0.588**	**0.678**	**0.611**	**0.622**	**0.548**	**0.566**	**0.706**	**0.576**	**0.585**
Total Lead	mg/L	0.01	MAC	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0004	<0.0002
Total Manganese	mg/L	0.02 0.12	AO MAC	**0.23**	**0.238**	**0.252**	**0.243**	**0.212**	**0.238**	**0.312**	**0.233**	**0.251**
Total Molybdenum	mg/L			<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.002	<0.001
Total Nickel	mg/L			<0.001	0.0011	<0.001	<0.001	<0.001	<0.001	<0.001	<0.002	<0.001
Total Selenium	mg/L	0.05	MAC	<0.0001	<0.0001	<0.0001	0.00126	0.00054	<0.0001	<0.0001	0.00024	0.001
Total Silicon	mg/L			13.7	15.6	14.9	14.4	13.2	15.9	16.3	15.9	15.8
Total Silver	mg/L			<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.00004	<0.00002
Total Strontium	mg/L			0.113	0.122	0.136	0.122	0.12	0.13	0.126	0.123	0.134
Total Thallium	mg/L			<0.00005	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00002	<0.00001
Total Tin	mg/L			<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.01	<0.005
Total Titanium	mg/L			<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.01	<0.0054
Total Uranium	mg/L	0.02	MAC	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0002	<0.0001
Total Vanadium	mg/L			<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.01	<0.005
Total Zinc	mg/L	5	AO	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.01	<0.005
Total Zirconium	mg/L			<0.0005	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0002	<0.0001
Total Calcium	mg/L			29.7	28.2	30.4	30.1	27.8	30.9	30.2	30.6	32.9
Total Magnesium	mg/L			10.7	11.4	10.9	10.6	10.7	11.4	11.4	11.5	12
Total Potassium	mg/L			2.36	2.78	2.68	2.67	2.57	2.64	2.69	2.66	2.62
Total Sodium	mg/L	200	AO	23.9	24	25	22.5	23.1	21.2	26.6	22.3	21.3
Total Sulphur	mg/L			<3.0	3.8	4	3.3	<3	3.5	3.3	<6	4.5

Notes below about Iron and Manganese from: https://www.canada.ca/en/health-canada/services/environmental-workplace-health/reports-publications/water-quality/guidelines-canadian-drinking-water-quality-summary-table.html#t2

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.
I = Inorganic chemical parameter	Iron (2024)	None	AO: ≤0.1	Naturally occurring (erosion and weathering of rocks and minerals due to geological processes); Released from iron-based drinking water materials or as iron corrosion by-products and in water treatment processes. Human activities such as mine drainage water, acid mine effluents and agricultural runoff.	A guideline value is not necessary as health effects are not of concern at levels found in drinking water and at the level at which the AO is set.	AO is for total iron and is based on minimizing the occurrence of discoloured water and to improve consumer confidence in drinking water quality. Removal of iron also improves the removal of manganese, reducing the health risk associated with this metal.

REGIONAL DISTRICT OF NANAIMO

Parker Road Raw Well Water Analysis
Parker Road (*well not in use at this time)

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 26 2016*	September 21 2017	October 22 2019	November 19 2020	November 4 2021	November 11 2022	November 9 2023	October 24 2024
Miscellaneous Inorganics											
Fluoride	mg/L	1.5	MAC	1.4	**1.6**	1.5	1.5	1.5	1.5	1.5	1.4
Alkalinity (total as CaCO)	mg/L			143	155	140	140	150	140	140	140
Anions											
Dissolved Sulphate	mg/L	500	AO	12.1	20.9	16	14	14	15	12	12
Dissolved Chloride	mg/L	250	AO	5.1	18	8.7	7.2	6.9	7.6	4.9	4.9
Nitrite	mg/L	1	MAC	<0.0050	<0.0050	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Miscellaneous											
Apparent Colour	Colour Unit			15	10	<5	10	<5	<5	5	13
Nutrients											
Total Ammonia	mg/L			0.31	0.21	0.25	0.21	0.2	0.21	0.21	0.21
Physical Properties											
Conductivity	µS/cm			314	381	330	330	310	320	320	320
pH	pH	6.5:8.5	AO	8.24	8.3	8.05	8.17	7.97	7.83	7.94	8.04
TDS	mg/L	500	AO	182	204	180	160	180	190	180	170
Turbidity	NTU			9.84	0.63	4.3	1.4	0.83	1.5	1.4	1.7
Microbiological Parameters											
E.coli	MPN/100mL	<1	MAC	<1.0	<1.0	0	0	0	0	0	0
Total Coliforms	MPN/100mL	<1	MAC	<1.0	<1.0	0	0	0	0	0	0
Calculated Parameters											
Total Hardness (CaCO)	mg/L			82.7	97.6	83.3	81.3	83.5	84.4	82	88.5
Nitrate	mg/L	10	MAC	<0.020	<0.020	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Elements											
Total Mercury	mg/L	0.001	MAC	<0.00001	<0.00001	<0.000002	<0.0000019	<0.0000019	<0.0000019	<0.0000019	<0.0000019
Total Metals											
Total Aluminum	mg/L	0.1	OG	**0.174**	<0.003	0.108	0.0457	0.0141	0.004	0.0036	0.0036
Total Antimony	mg/L	0.006	MAC	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Total Arsenic	mg/L	0.01	MAC	0.00094	0.00096	0.0009	0.00095	0.00094	0.00085	0.00086	0.00078
Total Barium	mg/L	1	MAC	0.139	0.166	0.144	0.138	0.134	0.127	0.127	0.132
Total Beryllium	mg/L			<0.0001	<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	<0.001
Total Boron	mg/L	5	MAC	0.327	0.444	0.359	0.371	0.335	0.366	0.316	0.286
Total Cadmium	mg/L	0.005	MAC	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.0001
Total Chromium	mg/L	0.05	MAC	0.0015	<0.001	0.0012	<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	<0.0002
Total Copper	mg/L	1	AO	0.00123	0.00022	0.00057	0.00116	0.00178	0.00067	0.00044	0.00045
Total Iron	mg/L	0.1	AO	**0.346**	**0.18**	**0.326**	**0.217**	**0.198**	**0.196**	**0.18**	**0.217**
Total Lead	mg/L	0.005	MAC	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Total Manganese	mg/L	0.02 0.12	AO MAC	0.0173	0.0147	0.0149	0.0129	0.0123	0.0131	0.0125	0.0134
Total Molybdenum	mg/L			0.0025	0.0022	0.0024	0.0027	0.0027	0.0025	0.0025	0.0028
Total Nickel	mg/L			0.001	<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	<0.0001
Total Silicon	mg/L			7.75	7.14	6.99	7.39	7.32	7.12	7.76	7.67
Total Silver	mg/L			<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002
Total Strontium	mg/L			0.465	0.546	0.504	0.493	0.482	0.462	0.453	0.49
Total Thallium	mg/L			<0.00005	<0.00001	<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	<0.005
Total Titanium	mg/L			0.007	<0.005	0.0074	<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	<0.0001
Total Vanadium	mg/L			<0.005	<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	<0.005	<0.005
Total Zirconium	mg/L			<0.0005	<0.0001	0.0002	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Total Calcium	mg/L			23.5	27.2	24.1	23.3	24	24.3	23.6	25.6
Total Magnesium	mg/L			5.82	7.2	5.65	5.61	5.74	5.77	5.58	5.99
Total Potassium	mg/L			2.23	2.61	2.38	2.39	2.34	2.18	2.2	2.39
Total Sodium	mg/L	200	AO	33	42.6	35.5	35	35.2	35.6	35.5	36.3
Total Sulphur	mg/L			4.1	7.7	4.8	4.4	4.6	3.9	4.2	4.3

Notes below about Iron and Manganese from: https://www.canada.ca/en/health-canada/services/environmental-workplace-health/reports-publications/water-quality/guidelines-canadian-drinking-water-quality-summary-table.html#t2

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.
I = Inorganic chemical parameter	Iron (2024)	None	AO: ≤0.1	Naturally occurring (erosion and weathering of rocks and minerals due to geological processes); Released from iron-based drinking water materials or as iron corrosion by-products and in water treatment processes. Human activities such as mine drainage water, acid mine effluents and agricultural runoff.	A guideline value is not necessary as health effects are not of concern at levels found in drinking water and at the level at which the AO is set.	AO is for total iron and is based on minimizing the occurrence of discoloured water and to improve consumer confidence in drinking water quality. Removal of iron also improves the removal of manganese, reducing the health risk associated with this metal.

REGIONAL DISTRICT OF NANAIMO

Madrona #4 Raw Well Water Analysis
Northwest Bay Logging 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 26 2016	September 20 2017	Nov. 6 2018	October 24 2019	November 5 2020	October 28 2021	October 20 2022	October 26 2023	October 10 2024
Miscellaneous Inorganics												
Fluoride	mg/L	1.5	MAC	0.13	0.12	0.14	0.16	0.12	0.12	0.13	0.14	0.096
Alkalinity (total as CaCO)	mg/L			132	132	135	130	140	130	130	130	130
Anions												
Dissolved Sulphate	mg/L	500	AO	6.38	6.4	6.3	6.1	6.2	6.9	6.3	5.9	5.9
Dissolved Chloride	mg/L	250	AO	20	19	22	23	22	17	21	20	19
Nitrite	mg/L	1	MAC	<0.0050	<0.0050	<0.0050	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Miscellaneous												
Apparent Colour	Colour Unit			15	10	10	15	10	<5	5	5	6.3
Nutrients												
Total Ammonia	mg/L			0.34	0.28	0.24	0.31	0.27	0.26	0.27	0.28	0.27
Physical Properties												
Conductivity	µS/cm			334	322	327	340	340	300	340	340	330
pH	pH	7.0:10.5	AO	8.35	8.33	8.23	8.17	8.47	7.93	8.31	8.27	8.26
TDS	mg/L	500	AO	186	170	170	180	190	190	180	190	160
Turbidity	NTU			5.68	0.76	2.25	0.17	0.15	0.19	0.13	0.23	0.18
Microbiological Parameters												
E.coli	MPN/100mL	<1	MAC	<1.0	<1.0	<1.0	0	0	0	0	0	0
Total Coliforms	MPN/100mL	<1	MAC	<1.0	<1.0	<1.0	0	0	0	0	0	0
Calculated Parameters												
Total Hardness (CaCO)	mg/L			42.7	43.4	40.9	39	42	48.5	43.2	42.8	47.4
Nitrate	mg/L	10	MAC	<0.020	<0.020	<0.020	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Elements												
Total Mercury	mg/L	0.001	MAC	<0.00001	<0.00001	<0.000002	<0.000002	<0.0000019	<0.0000019	0.0000024	<0.0000019	<0.0000019
Total Metals												
Total Aluminum	mg/L	0.1	OG	**0.203**	0.0107	0.023	0.0038	<0.003	0.0037	0.0047	<0.003	0.004
Total Antimony	mg/L	0.006	MAC	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Total Arsenic	mg/L	0.01	MAC	0.00962	0.00912	0.00867	0.00871	0.00884	0.0097	0.009	0.00879	0.00914
Total Barium	mg/L	1	MAC	0.0135	0.0111	0.0111	0.0114	0.011	0.0117	0.0112	0.0111	0.0114
Total Beryllium	mg/L			<0.0001	<0.0001	<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	<0.0001	<0.001
Total Boron	mg/L	5	MAC	0.165	0.147	0.156	0.155	0.153	0.122	0.171	0.153	0.144
Total Cadmium	mg/L	0.005	MAC	<0.00001	<0.00001	<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	<0.001	<0.001
Total Cobalt	mg/L			<0.0005	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Total Copper	mg/L	1	AO	0.00104	0.00041	0.0012	0.00048	0.00027	0.00174	0.00049	0.0006	0.00021
Total Iron	mg/L	0.1	AO	**0.219**	0.0179	0.043	0.0113	0.007	0.0164	0.0083	<0.005	0.0147
Total Lead	mg/L	0.01	MAC	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Total Manganese	mg/L	0.02 0.12	AO MAC	**0.0257**	**0.0232**	**0.0208**	0.0188	**0.0204**	**0.0257**	**0.021**	**0.0218**	**0.025**
Total Molybdenum	mg/L			0.0038	0.003	0.0037	0.0037	0.0034	0.0026	0.0034	0.0033	0.0028
Total Nickel	mg/L			<0.001	<0.001	<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	<0.0001	<0.0001
Total Silicon	mg/L			7.12	8.01	7.04	6.59	6.61	7.97	8.34	7.67	7.68
Total Silver	mg/L			<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002
Total Strontium	mg/L			0.0751	0.0764	0.0784	0.0786	0.0777	0.0887	0.0807	0.0777	0.0767
Total Thallium	mg/L			<0.00005	<0.00001	<0.00001	<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	<0.005	<0.005
Total Titanium	mg/L			0.0138	<0.005	<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	<0.0001	<0.0001
Total Vanadium	mg/L			<0.005	<0.005	<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	0.008	<0.005	<0.005	<0.005
Total Zirconium	mg/L			<0.0005	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Total Calcium	mg/L			11.4	11.8	11.1	10.6	11.5	13.3	11.5	11.6	13
Total Magnesium	mg/L			3.46	3.41	3.19	3.06	3.23	3.71	3.53	3.36	3.63
Total Potassium	mg/L			1.57	1.61	1.61	1.7	1.62	1.72	1.58	1.69	1.66
Total Sodium	mg/L	200	AO	59.1	53.3	55.9	57.3	54.6	45.2	56.5	53.9	49.5
Total Sulphur	mg/L			<3.0	<3.0	<3.0	<3	<3	<3	<3	<3	<3

Notes below about Iron and Manganese from: https://www.canada.ca/en/health-canada/services/environmental-workplace-health/reports-publications/water-quality/guidelines-canadian-drinking-water-quality-summary-table.html#t2

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.
I = Inorganic chemical parameter	Iron (2024)	None	AO: ≤0.1	Naturally occurring (erosion and weathering of rocks and minerals due to geological processes); Released from iron-based drinking water materials or as iron corrosion by-products and in water treatment processes. Human activities such as mine drainage water, acid mine effluents and agricultural runoff.	A guideline value is not necessary as health effects are not of concern at levels found in drinking water and at the level at which the AO is set.	AO is for total iron and is based on minimizing the occurrence of discoloured water and to improve consumer confidence in drinking water quality. Removal of iron also improves the removal of manganese, reducing the health risk associated with this metal.

REGIONAL DISTRICT OF NANAIMO

Madrona #8 Raw Well Water Analysis
1565 Stonelake Drive

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 26 2016	Sept 20 2017	Nov. 6 2018	October 17 2019	October 20 2020	October 28 2021	October 20 2022	October 26 2023	October 10 2024
Miscellaneous Inorganics												
Fluoride	mg/L	1.5	MAC	0.056	0.052	0.056	<0.05	<0.05	0.052	0.055	0.05	<0.05
Alkalinity (total as CaCO)	mg/L			189	194	192	190	210	200	190	180	170
Anions												
Dissolved Sulphate	mg/L	500	AO	11.6	12.9	13.3	15	17	17	16	16	15
Dissolved Chloride	mg/L	250	AO	13	15	19	20	23	23	20	21	22
Nitrite	mg/L	1	MAC	<0.0050	<0.0050	<0.0050	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Miscellaneous												
Apparent Colour	Colour Unit			<5.0	5	<5.0	5	10	<5	<5	5	<2
Nutrients												
Total Ammonia	mg/L			0.084	<0.020	<0.020	0.065	<0.015	<0.015	<0.015	<0.015	<0.015
Physical Properties												
Conductivity	µS/cm			475	486	505	520	550	530	530	530	500
pH	pH	7.0:10.5	AO	8.16	8.38	8.06	8.17	8.3	7.82	8.06	8.17	8.06
TDS	mg/L	500	AO	260	270	276	320	350	340	310	310	280
Turbidity	NTU			0.12	<0.10	0.12	<0.10	<0.1	<0.1	0.13	0.79	<0.1
Microbiological Parameters												
E.coli	MPN/100mL	<1	MAC	<1.0	<1.0	<1.0	0	0	0	0	0	0
Total Coliforms	MPN/100mL	<1	MAC	<1.0	<1.0	<1.0	0	0	0	0	0	0
Calculated Parameters												
Total Hardness (CaCO)	mg/L			232	229	243	234	263	238	242	235	218
Nitrate	mg/L	10	MAC	5.98	7.45	8.78	8.19	9.31	9.2	9.49	8.46	8.36
Elements												
Total Mercury	mg/L	0.001	MAC	<0.00001	<0.00001	<0.000002	<0.000002	<0.0000019	<0.0000019	0.0000022	<0.0000019	<0.0000019
Total Metals												
Total Aluminum	mg/L	0.1	OG	0.003	<0.003	0.0049	<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	<0.0005	<0.0005
Total Arsenic	mg/L	0.01	MAC	0.00124	0.00115	0.00109	0.00102	0.0011	0.0015	0.00115	0.0011	0.00105
Total Barium	mg/L	1	MAC	0.0114	0.0124	0.0129	0.0125	0.014	0.0136	0.0125	0.0136	0.012
Total Beryllium	mg/L			<0.0001	<0.0001	<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	<0.001	<0.001
Total Boron	mg/L	5	MAC	<0.050	<0.050	<0.050	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Total Cadmium	mg/L	0.005	MAC	<0.00001	<0.00001	<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	0.0012	<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	<0.0002	<0.0002
Total Copper	mg/L	1	AO	0.00347	0.00449	0.00789	0.00299	0.00258	0.00846	0.00335	0.00444	0.00365
Total Iron	mg/L	0.1	AO	0.006	<0.005	0.013	<0.005	<0.005	0.0062	<0.005	0.0068	<0.005
Total Lead	mg/L	0.01	MAC	0.00041	0.00034	0.00071	0.00022	<0.00020	0.00045	<0.0002	<0.0002	<0.0002
Total Manganese	mg/L	0.02 0.12	AO MAC	0.0013	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Total Molybdenum	mg/L			<0.001	<0.001	<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	<0.001	<0.001
Total Selenium	mg/L	0.05	MAC	0.00043	0.00042	0.00039	0.00044	0.0005	0.00045	0.00046	0.0005	0.00032
Total Silicon	mg/L			10.1	11.6	10.4	10.2	10.9	10.6	12.3	10.9	10.4
Total Silver	mg/L			<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002
Total Strontium	mg/L			0.12	0.132	0.141	0.133	0.152	0.15	0.136	0.141	0.124
Total Thallium	mg/L			<0.00005	<0.00001	<0.00001	<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	<0.005	<0.005
Total Titanium	mg/L			<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Total Uranium	mg/L	0.02	MAC	0.00015	0.00016	0.00015	0.00016	0.00018	0.00019	0.00016	0.00017	0.00014
Total Vanadium	mg/L			0.0069	0.0071	0.0068	0.0061	0.0066	0.0064	0.0062	0.0062	0.0058
Total Zinc	mg/L	5	AO	<0.005	<0.005	0.0071	<0.005	<0.005	0.0064	<0.005	0.006	<0.005
Total Zirconium	mg/L			<0.0005	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Total Calcium	mg/L			63.7	60.9	66.9	65.2	71.8	64.7	66.5	63.2	59
Total Magnesium	mg/L			17.6	18.8	18.4	17.3	20.4	18.5	18.5	18.7	17.2
Total Potassium	mg/L			0.768	0.881	0.873	0.85	0.987	0.901	0.809	0.856	0.825
Total Sodium	mg/L	200	AO	9.17	9.55	9.74	8.67	10	9.19	9.19	9.24	9.02
Total Sulphur	mg/L			3.9	4.3	3.9	4.5	5.3	5.5	5.8	5.9	4.6

Notes below about Iron and Manganese from: https://www.canada.ca/en/health-canada/services/environmental-workplace-health/reports-publications/water-quality/guidelines-canadian-drinking-water-quality-summary-table.html#t2

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.
I = Inorganic chemical parameter	Iron (2024)	None	AO: ≤0.1	Naturally occurring (erosion and weathering of rocks and minerals due to geological processes); Released from iron-based drinking water materials or as iron corrosion by-products and in water treatment processes. Human activities such as mine drainage water, acid mine effluents and agricultural runoff.	A guideline value is not necessary as health effects are not of concern at levels found in drinking water and at the level at which the AO is set.	AO is for total iron and is based on minimizing the occurrence of discoloured water and to improve consumer confidence in drinking water quality. Removal of iron also improves the removal of manganese, reducing the health risk associated with this metal.

REGIONAL DISTRICT OF NANAIMO

Nanoose #2 Raw Well Water Analysis
1987 Claudet Road
(Well not in use since October 2012)

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 26 2016	October 18 2017	Nov. 16 2018	October 24 2019	November 5 2020	November 4 2021	November 17 2022	November 9 2023	October 24 2024
Miscellaneous Inorganics												
Fluoride	mg/L	1.5	MAC	0.14	0.14	0.15	0.17	0.14	0.15	0.15	0.15	0.14
Alkalinity (total as CaCO)	mg/L			140	144	143	140	150	150	150	140	150
Anions												
Dissolved Sulphate	mg/L	500	AO	9.1	7.8	6.9	6.8	6.7	8.9	9.8	8.6	11
Dissolved Chloride	mg/L	250	AO	11	9.7	9.8	9.4	9.3	9.8	11	7.8	8
Nitrite	mg/L	1	MAC	<0.0050	<0.0050	<0.0050	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Miscellaneous												
Apparent Colour	Colour Unit			15	15	10	10	15	<5	<5	5	12
Nutrients												
Total Ammonia	mg/L			1	0.94	1	1	1.1	1.1	1.1	1.1	1.1
Physical Properties												
Conductivity	µS/cm			325	319	310	310	330	310	320	330	330
pH	pH	7.0:10.5	AO	8.2	8.28	8.08	8.05	8.34	8.09	8	7.92	8.1
TDS	mg/L	500	AO	176	162	170	160	190	180	170	180	180
Turbidity	NTU			0.77	0.55	0.45	0.69	0.37	0.31	0.34	0.61	0.54
Microbiological Parameters												
E.coli	MPN/100mL	<1	MAC	<1.0	<1.0	<1.0	0	0	0	0	0	0
Total Coliforms	MPN/100mL	<1	MAC	<1.0	<1.0	<1.0	0	0	0	0	0	0
Calculated Parameters												
Total Hardness (CaCO)	mg/L			133	129	135	127	122	127	132	129	140
Nitrate	mg/L	10	MAC	<0.020	<0.020	<0.020	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Elements												
Total Mercury	mg/L	0.001	MAC	<0.00001	<0.00001	<0.000002	<0.000002	<0.0000019	<0.000019	<0.0000019	<0.0000019	<0.0000019
Total Metals												
Total Aluminum	mg/L	0.1	OG	<0.003	<0.003	0.0034	<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	<0.005	<0.0005	<0.0005
Total Arsenic	mg/L	0.01	MAC	0.00043	0.00037	0.00034	0.00037	0.00032	0.00033	0.00032	0.00028	0.00024
Total Barium	mg/L	1	MAC	0.0177	0.019	0.0178	0.0175	0.0178	0.018	0.0177	0.0177	0.0198
Total Beryllium	mg/L			<0.0001	<0.0001	<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	<0.001	<0.001
Total Boron	mg/L	5	MAC	0.058	0.053	0.068	0.06	0.059	0.067	0.062	0.064	0.09
Total Cadmium	mg/L	0.005	MAC	<0.00001	<0.00001	<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	<0.001	<0.001
Total Cobalt	mg/L			<0.0005	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Total Copper	mg/L	1	AO	0.00028	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Total Iron	mg/L	0.1	AO	**0.198**	**0.194**	**0.198**	**0.206**	**0.187**	**0.193**	**0.2**	**0.194**	**0.221**
Total Lead	mg/L	0.01	MAC	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Total Manganese	mg/L	0.02 0.12	AO MAC	**0.109**	**0.114**	**0.115**	**0.113**	**0.112**	**0.111**	**0.108**	**0.111**	**0.116**
Total Molybdenum	mg/L			<0.001	<0.001	<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	<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	<0.0001	<0.0001
Total Silicon	mg/L			10.3	11	11.1	10.1	9.93	10.9	10.8	11.7	11.2
Total Silver	mg/L			<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002
Total Strontium	mg/L			0.137	0.139	0.141	0.136	0.137	0.145	0.135	0.14	0.147
Total Thallium	mg/L			<0.00005	<0.00001	<0.00001	<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	<00.005	<0.005	<0.005
Total Titanium	mg/L			<0.005	<0.005	<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	<0.0001	<0.0001
Total Vanadium	mg/L			<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Total Zinc	mg/L	5	AO	<0.005	<0.005	0.0076	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Total Zirconium	mg/L			<0.0005	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Total Calcium	mg/L			37.7	36.2	37.6	36	33.9	35.7	37.3	36.2	39.6
Total Magnesium	mg/L			9.45	9.49	9.92	8.92	8.96	9.27	9.4	9.3	9.93
Total Potassium	mg/L			2.32	2.57	2.58	2.51	2.47	2.62	2.48	2.49	2.8
Total Sodium	mg/L	200	AO	14.5	14.3	15.3	14	13.9	14.6	15.2	14.9	15.9
Total Sulphur	mg/L			3.5	<3.0	<3.0	<3	<3	<3	3.1	<3	4

Notes below about Iron and Manganese from: https://www.canada.ca/en/health-canada/services/environmental-workplace-health/reports-publications/water-quality/guidelines-canadian-drinking-water-quality-summary-table.html#t2

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.
I = Inorganic chemical parameter	Iron (2024)	None	AO: ≤0.1	Naturally occurring (erosion and weathering of rocks and minerals due to geological processes); Released from iron-based drinking water materials or as iron corrosion by-products and in water treatment processes. Human activities such as mine drainage water, acid mine effluents and agricultural runoff.	A guideline value is not necessary as health effects are not of concern at levels found in drinking water and at the level at which the AO is set.	AO is for total iron and is based on minimizing the occurrence of discoloured water and to improve consumer confidence in drinking water quality. Removal of iron also improves the removal of manganese, reducing the health risk associated with this metal.

REGIONAL DISTRICT OF NANAIMO

Nanoose #3 Raw Well Water Analysis
1900 Delanice Way
(Well not in use since October 2012)

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 26 2016	October 18 2017	Nov 16 2018	October 24 2019	November 5 2020	November 4 2021	November 17 2022	November 9 2023	October 10 2024
Miscellaneous Inorganics												
Fluoride	mg/L	1.5	MAC	0.13	0.13	0.13	0.15	0.13	0.14	0.14	0.14	0.11
Alkalinity (total as CaCO)	mg/L			160	166	166	160	170	170	170	160	170
Anions												
Dissolved Sulphate	mg/L	500	AO	<0.50	<1.0	<1.0	<1	<1	<1	<1.0	<1	<1
Dissolved Chloride	mg/L	250	AO	7.7	7.8	8.4	8.4	8.5	9.1	10	7.1	7.2
Nitrite	mg/L	1	MAC	<0.0050	<0.0050	<0.0050	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Miscellaneous												
Apparent Colour	Colour Unit			30	30	15	30	20	10	15	15	39
Nutrients												
Total Ammonia	mg/L			1.1	0.95	0.96	1	1	0.98	1.1	1	0.92
Physical Properties												
Conductivity	µS/cm			330	332	330	330	330	330	340	340	330
pH	pH	7.0:10.5	AO	8.14	8.26	8.14	8.1	8.34	8.07	7.97	7.89	8.07
TDS	mg/L	500	AO	188	174	192	170	200	200	180	180	180
Turbidity	NTU			3.75	3.15	3.81	4.2	3.2	2.9	3.2	3.6	3.3
Microbiological Parameters												
E.coli	MPN/100mL	<1	MAC	<1.0	<1.0	<1.0	0	0	0	0	0	0
Total Coliforms	MPN/100mL	<1	MAC	**4.2**	**4.2**	<1.0	0	0	0	0	0	0
Calculated Parameters												
Total Hardness (CaCO)	mg/L			133	130	137	129	126	125	131	128	135
Nitrate	mg/L	10	MAC	<0.020	<0.020	<0.020	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Elements												
Total Mercury	mg/L	0.001	MAC	<0.00001	<0.00001	<0.000002	<0.000002	<0.0000019	<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	<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	<0.0005	<0.0005
Total Arsenic	mg/L	0.01	MAC	0.00113	0.00116	0.00086	0.00118	0.00105	0.00106	0.0011	0.001	0.00078
Total Barium	mg/L	1	MAC	0.0149	0.0164	0.0155	0.0159	0.016	0.0154	0.0154	0.015	0.0156
Total Beryllium	mg/L			<0.0001	<0.0001	<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	<0.001	<0.001
Total Boron	mg/L	5	MAC	0.05	0.05	0.061	0.054	0.053	0.058	0.056	0.058	0.074
Total Cadmium	mg/L	0.005	MAC	<0.00001	<0.00001	<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	<0.001	<0.001
Total Cobalt	mg/L			<0.0005	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Total Copper	mg/L	1	AO	0.00115	0.002	0.00055	0.00872	0.00181	0.00164	0.00029	<0.0002	<0.0002
Total Iron	mg/L	0.1	AO	**1.13**	**1.14**	**1.19**	**1.15**	**1.15**	**1.08**	**1.16**	**1.11**	**1.24**
Total Lead	mg/L	0.005	MAC	0.00035	0.00021	<0.0002	0.00066	0.00085	<0.0002	<0.0002	<0.0002	<0.0002
Total Manganese	mg/L	0.02 0.12	AO MAC	**0.249**	**0.261**	**0.266**	**0.279**	**0.261**	**0.257**	**0.244**	**0.249**	**0.253**
Total Molybdenum	mg/L			<0.001	<0.001	<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	<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	<0.0001	0.00016
Total Silicon	mg/L			12.6	13.5	13.5	12.4	12.6	13.4	13.3	14.8	13.9
Total Silver	mg/L			<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002
Total Strontium	mg/L			0.107	0.112	0.113	0.111	0.106	0.113	0.104	0.106	0.107
Total Thallium	mg/L			<0.00005	<0.00001	<0.00001	<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	<0.005	<0.005
Total Titanium	mg/L			<0.005	<0.005	<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	<0.0001	<0.0001
Total Vanadium	mg/L			<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Total Zinc	mg/L	5	AO	0.0182	0.0107	<0.005	0.009	0.0097	<0.005	<0.005	<0.005	<0.005
Total Zirconium	mg/L			<0.0005	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Total Calcium	mg/L			33.2	32.5	34	32.8	31.5	30.9	33	31.8	34.4
Total Magnesium	mg/L			12.1	12	12.7	11.4	11.6	11.7	11.7	11.7	11.8
Total Potassium	mg/L			1.96	2.13	2.17	2.14	2.09	2.19	2.01	2.06	2.25
Total Sodium	mg/L	200	AO	18.6	18.4	20.2	18.8	18.8	19.3	19.5	19.8	20.5
Total Sulphur	mg/L			<3.0	<3.0	<3.0	<3.0	<3	<3	<3	<3	<3

Notes below about Iron and Manganese from: https://www.canada.ca/en/health-canada/services/environmental-workplace-health/reports-publications/water-quality/guidelines-canadian-drinking-water-quality-summary-table.html#t2

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.
I = Inorganic chemical parameter	Iron (2024)	None	AO: ≤0.1	Naturally occurring (erosion and weathering of rocks and minerals due to geological processes); Released from iron-based drinking water materials or as iron corrosion by-products and in water treatment processes. Human activities such as mine drainage water, acid mine effluents and agricultural runoff.	A guideline value is not necessary as health effects are not of concern at levels found in drinking water and at the level at which the AO is set.	AO is for total iron and is based on minimizing the occurrence of discoloured water and to improve consumer confidence in drinking water quality. Removal of iron also improves the removal of manganese, reducing the health risk associated with this metal.

REGIONAL DISTRICT OF NANAIMO

Nanoose #4 Raw Well Water Analysis
2311 Northwest Bay Road
(Well not in use since October 2012)

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 26 2016	October 18 2017	November 16 2018	October 24 2019	November 5 2020	November 4 2021	November 17 2022	November 9 2023	October 24 2024
Miscellaneous Inorganics												
Fluoride	mg/L	1.5	MAC	0.18	0.17	0.18	0.2	0.16	0.18	0.18	0.17	0.16
Alkalinity (total as CaCO)	mg/L			158	164	161	160	170	170	160	160	170
Anions												
Dissolved Sulphate	mg/L	500	AO	<0.50	<1.0	<1.0	<1.0	<1	<1	<1.0	<1	<1
Dissolved Chloride	mg/L	250	AO	3.7	3.8	3.5	3.4	3.6	3.8	4.6	3.6	3.1
Nitrite	mg/L	1	MAC	<0.0050	<0.0050	<0.0050	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Miscellaneous												
Apparent Colour	Colour Unit			15	30	15	15	20	10	15	15	23
Nutrients												
Total Ammonia	mg/L			1.2	1.1	1.1	1.1	1.2	1.1	1.2	1.1	1.1
Physical Properties												
Conductivity	µS/cm			313	314	308	310	320	300	320	320	320
pH	pH	7.0:10.5	AO	8.1	8.26	8.15	8.14	8.33	8.1	8	8.15	8.04
TDS	mg/L	500	AO	190	166	154	180	190	180	180	190	180
Turbidity	NTU			1.68	1	1.35	1.1	1.5	1.6	1.3	4.2	1.6
Microbiological Parameters												
E.coli	MPN/100mL	<1	MAC	<1.0	<1.0	<1.0	0	0	0	0	0	0
Total Coliforms	MPN/100mL	<1	MAC	<1.0	<1.0	<1.0	0	0	0	0	0	0
Calculated Parameters												
Total Hardness (CaCO)	mg/L			117	113	123	113	113	116	118	115	124
Nitrate	mg/L	10	MAC	<0.020	<0.020	<0.020	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Elements												
Total Mercury	mg/L	0.001	MAC	<0.00001	<0.00001	<0.000002	<0.000002	<0.0000019	<0.0000019	<0.0000019	<0.0000019	<0.0000019
Total Metals												
Total Aluminum	mg/L	0.1	OG	<0.003	<0.003	0.0036	0.0041	<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	<0.0005	<0.0005
Total Arsenic	mg/L	0.01	MAC	0.00233	0.00247	0.00228	0.00231	0.00239	0.00246	0.00235	0.00234	0.00218
Total Barium	mg/L	1	MAC	0.0082	0.0088	0.0084	0.0082	0.0083	0.0084	0.008	0.008	0.0083
Total Beryllium	mg/L			<0.0001	<0.0001	<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	<0.001	<0.001
Total Boron	mg/L	5	MAC	0.062	0.062	0.068	0.061	0.057	0.064	0.061	0.061	0.075
Total Cadmium	mg/L	0.005	MAC	<0.00001	<0.00001	<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	0.0012	<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	<0.0002	<0.0002
Total Copper	mg/L	1	AO	0.00175	0.00086	0.00122	0.00198	0.00078	0.00042	0.00058	0.00023	<0.0002
Total Iron	mg/L	0.1	AO	**0.599**	**0.619**	**0.663**	**0.682**	**0.627**	**0.642**	**0.644**	**0.626**	**0.732**
Total Lead	mg/L	0.01	MAC	0.00022	0.00025	<0.0002	0.00025	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Total Manganese	mg/L	0.02 0.12	AO MAC	**0.231**	**0.242**	**0.251**	**0.256**	**0.237**	**0.246**	**0.229**	**0.232**	**0.243**
Total Molybdenum	mg/L			<0.001	<0.001	<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	<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	<0.0001	<0.0001
Total Silicon	mg/L			15.2	15.4	16.3	14.5	15.3	16.3	15.7	17.4	16.7
Total Silver	mg/L			<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002
Total Strontium	mg/L			0.100	0.104	0.106	0.102	0.101	0.108	0.0992	0.0973	0.102
Total Thallium	mg/L			<0.00005	<0.00001	<0.00001	<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	<0.005	<0.005
Total Titanium	mg/L			<0.005	<0.005	<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	<0.0001	<0.0001
Total Vanadium	mg/L			<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Total Zinc	mg/L	5	AO	0.0084	<0.005	0.0085	0.0057	0.0074	<0.005	<0.005	<0.005	<0.005
Total Zirconium	mg/L			<0.0005	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Total Calcium	mg/L			28.5	27	29.6	27.8	27.5	27.9	28.9	27.7	30.5
Total Magnesium	mg/L			11.1	11.2	11.9	10.6	10.7	11.3	11.1	11.2	11.6
Total Potassium	mg/L			2.05	2.22	2.32	2.224	2.21	2.35	2.14	2.17	2.41
Total Sodium	mg/L	200	AO	20.6	20.2	22	19.6	19.4	20.5	20.3	20.3	21.4
Total Sulphur	mg/L			<3.0	<3.0	<3.0	<3.0	<3	<3	<3	<3	<3

Notes below about Iron and Manganese from: https://www.canada.ca/en/health-canada/services/environmental-workplace-health/reports-publications/water-quality/guidelines-canadian-drinking-water-quality-summary-table.html#t2

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.
I = Inorganic chemical parameter	Iron (2024)	None	AO: ≤0.1	Naturally occurring (erosion and weathering of rocks and minerals due to geological processes); Released from iron-based drinking water materials or as iron corrosion by-products and in water treatment processes. Human activities such as mine drainage water, acid mine effluents and agricultural runoff.	A guideline value is not necessary as health effects are not of concern at levels found in drinking water and at the level at which the AO is set.	AO is for total iron and is based on minimizing the occurrence of discoloured water and to improve consumer confidence in drinking water quality. Removal of iron also improves the removal of manganese, reducing the health risk associated with this metal.

REGIONAL DISTRICT OF NANAIMO

West Bay #3 Raw Well Water Analysis
2473 Nanoose Road
Well water was sent to the WTP from 2012-2019. Well is no longer in use.

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		November 5 2014	October 26 2015	October 26 2016	September 21 2017	November 6 2018
Miscellaneous Inorganics								
Fluoride	mg/L	1.5	MAC	0.25	0.16	0.16	0.16	0.16
Alkalinity (total as CaCO)	mg/L			140	135	139	146	138
Anions								
Dissolved Sulphate	mg/L	500	AO	3.3	3.67	4.49	6.5	6.4
Dissolved Chloride	mg/L	250	AO	7	7.7	7.6	7.9	8
Nitrite	mg/L	1	MAC	<0.05	<0.0050	<0.0050	<0.0050	<0.0050
Miscellaneous								
Apparent Colour	Colour Unit			21	20	20	20	15
Nutrients								
Total Ammonia	mg/L			1.11	1.2	1.2	1.1	1.1
Physical Properties								
Conductivity	µS/cm			293	296	303	296	300
pH	pH	7.0:10.5	AO	7.9	8.22	8.09	8.23	8.08
TDS	mg/L	500	AO	240	168	176	174	148
Turbidity	NTU			0.9	0.56	1.06	1.14	0.61
Microbiological Parameters								
E.coli	MPN/100mL	<1	MAC	<1.0	<1.0	<1.0	<1.0	<1.0
Total Coliforms	MPN/100mL	<1	MAC	<1.0	<1.0	<1.0	<1.0	<1.0
Calculated Parameters								
Total Hardness (CaCO)	mg/L			110	105	103	109	108
Nitrate	mg/L	10	MAC	<0.05	<0.020	<0.020	<0.020	<0.020
Elements								
Total Mercury	mg/L	0.001	MAC	<0.00001	<0.00001	<0.00001	<0.00001	<0.000002
Total Metals								
Total Aluminum	mg/L	0.1	OG	<0.005	<0.003	0.013	<0.003	<0.003
Total Antimony	mg/L	0.006	MAC	<0.0001	<0.0005	<0.0005	<0.0005	<0.0005
Total Arsenic	mg/L	0.01	MAC	0.00043	0.00038	0.00041	0.0004	0.00034
Total Barium	mg/L	1	MAC	0.006	0.0053	0.006	0.0057	0.006
Total Beryllium	mg/L			<0.00005	<0.0001	<0.0001	<0.0001	<0.0001
Total Bismuth	mg/L			<0.0001	<0.001	<0.001	<0.001	<0.001
Total Boron	mg/L	5	MAC	0.066	0.065	0.062	0.071	0.062
Total Cadmium	mg/L	0.005	MAC	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001
Total Chromium	mg/L	0.05	MAC	<0.0005	<0.001	<0.001	<0.001	<0.001
Total Cobalt	mg/L			<0.0001	<0.0005	<0.0005	<0.0002	<0.0002
Total Copper	mg/L	1	AO	0.0011	0.00051	0.0241	0.00215	<0.0005
Total Iron	mg/L	0.1	AO	**0.533**	**0.527**	**0.551**	**0.568**	**0.54**
Total Lead	mg/L	0.01	MAC	0.0003	<0.0002	0.00037	0.00032	<0.0002
Total Manganese	mg/L	0.02 0.12	AO MAC	**0.209**	**0.2**	**0.203**	**0.196**	**0.203**
Total Molybdenum	mg/L			0.00022	<0.001	<0.001	<0.001	<0.001
Total Nickel	mg/L			<0.0002	<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
Total Silicon	mg/L			14.2	16	14.3	16.1	14.2
Total Silver	mg/L			<0.00005	<0.00002	<0.00002	<0.00002	<0.00002
Total Strontium	mg/L			0.102	0.0929	0.102	0.101	0.106
Total Thallium	mg/L			<0.00001	<0.00005	<0.00005	<0.00001	<0.00001
Total Tin	mg/L			<0.0001	<0.005	<0.005	<0.005	<0.005
Total Titanium	mg/L			0.0006	<0.005	<0.005	<0.005	<0.005
Total Uranium	mg/L	0.02	MAC	<0.00001	<0.0001	<0.0001	<0.0001	<0.0001
Total Vanadium	mg/L			0.0007	<0.005	<0.005	<0.005	<0.005
Total Zinc	mg/L	5	AO	0.0076	<0.005	0.0134	0.0157	<0.005
Total Zirconium	mg/L				<0.0005	<0.0005	<0.0001	<0.0001
Total Calcium	mg/L			27.6	26.9	25.8	28	27.5
Total Magnesium	mg/L			9.53	9.2	9.41	9.46	9.57
Total Potassium	mg/L			2.4	2.35	2.26	2.36	2.28
Total Sodium	mg/L	200	AO	20.6	20.5	18.5	18.5	18.7
Total Sulphur	mg/L				<3.0	<3.0	<3.0	<3.0

Notes below about Iron and Manganese from: https://www.canada.ca/en/health-canada/services/environmental-workplace-health/reports-publications/water-quality/guidelines-canadian-drinking-water-quality-summary-table.html#t2

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.
I = Inorganic chemical parameter	Iron (2024)	None	AO: ≤0.1	Naturally occurring (erosion and weathering of rocks and minerals due to geological processes); Released from iron-based drinking water materials or as iron corrosion by-products and in water treatment processes. Human activities such as mine drainage water, acid mine effluents and agricultural runoff.	A guideline value is not necessary as health effects are not of concern at levels found in drinking water and at the level at which the AO is set.	AO is for total iron and is based on minimizing the occurrence of discoloured water and to improve consumer confidence in drinking water quality. Removal of iron also improves the removal of manganese, reducing the health risk associated with this metal.

REGIONAL DISTRICT OF NANAIMO

Wall Brook #1 Raw Well Water Analysis
1610 Northwest Bay 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		September 20 2017	November 6 2018	October 17 2019	November 19 2020	November 4 2021
Miscellaneous Inorganics								
Fluoride	mg/L	1.5	MAC	0.082	0.089	0.054	0.082	0.086
Alkalinity (total as CaCO)	mg/L			139	147	140	170	180
Anions								
Dissolved Sulphate	mg/L	500	AO	17.5	15.8	22	17	16
Dissolved Chloride	mg/L	250	AO	23	11	19	6.8	7
Nitrite	mg/L	1	MAC	<0.0050	<0.0050	<0.005	<0.005	<0.005
Miscellaneous								
Apparent Colour	Colour Unit			10	5	5	10	<5
Nutrients								
Total Ammonia	mg/L			0.092	0.086	0.18	0.1	0.096
Physical Properties								
Conductivity	µS/cm			366	344	380	380	360
pH	pH	7.0:10.5	AO	8.29	8.07	8.08	8.22	7.99
TDS	mg/L	500	AO	198	180	230	220	210
Turbidity	NTU			0.19	0.11	<0.1	0.18	0.18
Microbiological Parameters								
E.coli	MPN/100mL	<1	MAC	<1.0	<1.0	0	0	0
Total Coliforms	MPN/100mL	<1	MAC	<1.0	<1.0	0	0	0
Calculated Parameters								
Total Hardness (CaCO)	mg/L			140	142	138	152	157
Nitrate	mg/L	10	MAC	<0.020	<0.020	<0.02	<0.02	<0.02
Elements								
Total Mercury	mg/L	0.001	MAC	<0.00001	<0.000002	0.000027	<0.0000019	<0.0000019
Total Metals								
Total Aluminum	mg/L	0.1	OG	<0.003	<0.003	<0.003	0.0041	<0.003
Total Antimony	mg/L	0.006	MAC	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Total Arsenic	mg/L	0.01	MAC	0.00273	0.00268	0.00232	0.00292	0.00297
Total Barium	mg/L	1	MAC	0.0162	0.0171	0.0172	0.0194	0.0185
Total Beryllium	mg/L			<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Total Bismuth	mg/L			<0.001	<0.001	<0.001	<0.001	<0.001
Total Boron	mg/L	5	MAC	<0.050	<0.050	0.055	<0.05	<0.05
Total Cadmium	mg/L	0.005	MAC	<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
Total Cobalt	mg/L			<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Total Copper	mg/L	1	AO	0.00024	0.00271	0.00034	0.0004	0.0015
Total Iron	mg/L	0.1	AO	0.0117	0.011	0.0198	0.0572	0.0356
Total Lead	mg/L	0.005	MAC	<0.0002	0.00043	<0.0002	<0.0002	<0.0002
Total Manganese	mg/L	0.02 0.12	AO MAC	**0.115**	**0.118**	**0.123**	**0.138**	**0.143**
Total Molybdenum	mg/L			<0.001	0.0011	<0.001	<0.001	<0.001
Total Nickel	mg/L			<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
Total Silicon	mg/L			11.7	10.4	9.64	10.9	11.4
Total Silver	mg/L			<0.00002	<0.00002	<0.00002	<0.00002	<0.00002
Total Strontium	mg/L			0.116	0.124	0.119	0.132	0.136
Total Thallium	mg/L			<0.00001	<0.00001	<0.00001	<0.00001	<0.00001
Total Tin	mg/L			<0.005	<0.005	<0.005	<0.005	<0.005
Total Titanium	mg/L			<0.005	<0.005	<0.005	<0.005	<0.005
Total Uranium	mg/L	0.02	MAC	0.00014	0.00018	0.00017	0.00027	0.00028
Total Vanadium	mg/L			<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
Total Zirconium	mg/L			<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Total Calcium	mg/L			36.1	36.9	36.8	39.1	40.1
Total Magnesium	mg/L			12.1	12.1	11.3	13.3	13.8
Total Potassium	mg/L			1.36	1.39	1.38	1.52	1.57
Total Sodium	mg/L	200	AO	18.4	17.8	18.7	17.2	17
Total Sulphur	mg/L			5.7	5.3	5.4	5.5	4.9

Notes below about Iron and Manganese from: https://www.canada.ca/en/health-canada/services/environmental-workplace-health/reports-publications/water-quality/guidelines-canadian-drinking-water-quality-summary-table.html#t2

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.
I = Inorganic chemical parameter	Iron (2024)	None	AO: ≤0.1	Naturally occurring (erosion and weathering of rocks and minerals due to geological processes); Released from iron-based drinking water materials or as iron corrosion by-products and in water treatment processes. Human activities such as mine drainage water, acid mine effluents and agricultural runoff.	A guideline value is not necessary as health effects are not of concern at levels found in drinking water and at the level at which the AO is set.	AO is for total iron and is based on minimizing the occurrence of discoloured water and to improve consumer confidence in drinking water quality. Removal of iron also improves the removal of manganese, reducing the health risk associated with this metal.