REGIONAL DISTRICT OF NANAIMO

Englishman River PW2 Raw Well Water Analysis
2231 Rascal Lane

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

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

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

	Units	CDWG		October 29 2018	October 17 2019	October 20 2020	July 14 2021	October 14 2021	October 20 2022	October 12 2023	October 10 2024
Miscellaneous Inorganics											
Fluoride	mg/L	1.5	MAC	0.09	0.085	0.082	0.08	0.089	0.088	0.083	0.52
Alkalinity (total as CaCO)	mg/L			126	130	130	130	130	120	120	120
Anions											
Dissolved Sulphate	mg/L	500	AO	6.8	7.5	8	9.4	9.3	7.4	7.8	7.8
Dissolved Chloride	mg/L	250	AO	56	67	83	92	82	93	91	110
Nitrite	mg/L	1	MAC	<0.0050	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Miscellaneous											
Apparent Colour	Colour Unit			5	5	10	<5	<5	<5	<5	<2
Nutrients											
Total Ammonia	mg/L			0.045	0.13	0.061	0.049	0.049	0.068	0.067	0.066
Physical Properties											
Conductivity	µS/cm			446	460	510	530	500	580	550	650
pH	pH	7.0:10.5	OG	8.17	8	8.2	7.9	8.24	8.11	8	8.11
TDS	mg/L	500	AO	266	270	240	350	330	350	380	380
Turbidity	NTU			0.18	<0.1	<0.1	0.19	0.12	<0.1	0.8	0.14
Microbiological Parameters											
E.coli	MPN/100mL	1	MAC	<1.0	0	0	0	0	0	0	0
Total Coliforms	MPN/100mL	1	MAC	<1.0	0	0	0	0	0	0	0
Calculated Parameters											
Total Hardness (CaCO)	mg/L			169	168	190	194	188	208	201	219
Nitrate	mg/L	10	MAC	<0.020	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Elements											
Total Mercury	mg/L	0.001	MAC	<0.000002	<0.000002	<0.0000019	<0.0000019	<0.0000019	<0.0000019	<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	0.0032
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	0.00172	0.00163	0.0017	0.00164	0.0017	0.0017	0.00159	0.00158
Total Barium	mg/L	1	MAC	0.0263	0.0269	0.0307	0.0329	0.0306	0.0341	0.0323	0.0368
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	<0.050	<0.05	<0.05	<0.05	<0.05	0.056	0.052	0.057
Total Cadmium	mg/L	0.005	MAC	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	0.000032	<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
Total Cobalt	mg/L			<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Total Copper	mg/L	1	AO	0.00137	0.00043	0.0004	0.00699	0.00267	0.00045	0.00086	0.00057
Total Iron	mg/L	0.1	AO	0.0247	0.0216	0.0055	0.0544	0.025	0.0087	0.0228	0.0169
Total Lead	mg/L	0.01	MAC	0.00037	<0.0002	<0.0002	0.0004	<0.0002	<0.0002	0.00241	<0.0002
Total Manganese	mg/L	0.02 0.12	AO MAC	**0.0311**	**0.0304**	**0.0339**	**0.0365**	**0.034**	**0.0375**	**0.0344**	**0.0396**
Total Molybdenum	mg/L			0.0014	0.0012	0.0013	0.0014	0.0014	0.0012	0.0013	0.0013
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			6.9	6.5	6.72	5.86	7.03	7.89	7.31	6.71
Total Silver	mg/L			<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	0.00002	<0.00002
Total Strontium	mg/L			0.315	0.317	0.371	0.373	0.382	0.428	0.379	0.422
Total Thallium	mg/L			<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
Total Titanium	mg/L			<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Total Uranium	mg/L	0.02	MAC	0.00032	0.00031	0.00033	0.00032	0.00032	0.00031	0.0003	0.0003
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	0.0091	0.0052	<0.005	0.0059	0.0095	<0.005	0.0378	<0.005
Total Zirconium	mg/L			<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Total Calcium	mg/L			43.8	43.6	47.9	49	48.1	53.6	52.7	56.3
Total Magnesium	mg/L			14.4	14.4	17	17.5	16.4	18	16.9	19.1
Total Potassium	mg/L			1.35	1.36	1.5	1.53	1.5	1.44	1.53	1.62
Total Sodium	mg/L	200	AO	17.4	18	21.5	22.2	20.8	23.4	23.3	25.2
Total Sulphur	mg/L			<3.0	<3	<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.

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	Units	CDWG		October 29 2018	October 17 2019	October 20 2020	July 14 2021	October 14 2021	October 20 2022	October 12 2023	October 10 2024
Miscellaneous Inorganics											
Fluoride	mg/L	1.5	MAC	0.094	0.084	0.086	0.087	0.091	0.095	0.087	0.056
Alkalinity (total as CaCO)	mg/L			129	130	130	130	140	130	130	130
Anions											
Dissolved Sulphate	mg/L	500	AO	7.5	8.1	8.5	10	9	7.6	8.1	8
Dissolved Chloride	mg/L	250	AO	85	98	99	100	100	92	100	100
Nitrite	mg/L	1	MAC	<0.0050	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Miscellaneous											
Apparent Colour	Colour Unit			5	10	10	<5	<5	<5	<5	<2
Nutrients											
Total Ammonia	mg/L			0.058	0.13	0.069	0.058	0.05	0.065	0.068	0.067
Physical Properties											
Conductivity	µS/cm			554	570	570	550	580	580	610	600
pH	pH	7.0:10.5	OG	8.16	7.96	8.21	7.97	8.29	8.13	8.05	8.09
TDS	mg/L	500	AO	326	330	330	340	370	280	390	340
Turbidity	NTU			0.35	0.41	0.13	0.21	1.1	0.1	0.58	0.17
Microbiological Parameters											
E.coli	MPN/100mL	<1	MAC	<1.0	0	0	0	0	0	0	0
Total Coliforms	MPN/100mL	<1	MAC	<1.0	0	0	0	0	0	0	0
Calculated Parameters											
Total Hardness (CaCO)	mg/L			182	186	197	180	193	195	195	188
Nitrate	mg/L	10	MAC	<0.020	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Elements											
Total Mercury	mg/L	0.001	MAC	<0.000002	<0.000002	<0.0000019	<0.0000019	<0.0000019	0.0000034	<0.0000019	<0.0000019
Total Metals											
Total Aluminum	mg/L	0.1	OG	<0.003	<0.03	<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
Total Arsenic	mg/L	0.01	MAC	0.00146	0.00148	0.00154	0.00151	0.00162	0.00168	0.00152	0.00153
Total Barium	mg/L	1	MAC	0.032	0.0331	0.034	0.034	0.0353	0.0351	0.0351	0.0348
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	0.068	0.075	0.08	0.073	0.081	0.095	0.089	0.095
Total Cadmium	mg/L	0.005	MAC	<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	0.0018	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Total Cobalt	mg/L			<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Total Copper	mg/L	1	AO	0.00175	0.00065	0.00048	0.00324	0.00358	0.00061	0.00076	0.0009
Total Iron	mg/L	0.1	AO	0.0477	0.0541	0.0286	0.0492	**0.101**	0.0284	0.0591	0.0269
Total Lead	mg/L	0.01	MAC	0.00031	<0.0002	<0.0002	<0.0002	0.0003	<0.0002	<0.0002	<0.0002
Total Manganese	mg/L	0.02 0.12	AO MAC	**0.0481**	**0.0475**	**0.0452**	**0.0456**	**0.0467**	**0.0473**	**0.0447**	**0.0452**
Total Molybdenum	mg/L			<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
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			6.97	6.83	7.57	6.1	7.38	8.37	7.73	6.84
Total Silver	mg/L			<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002
Total Strontium	mg/L			0.357	0.377	0.388	0.365	0.426	0.428	0.4	0.392
Total Thallium	mg/L			<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
Total Titanium	mg/L			<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Total Uranium	mg/L	0.02	MAC	0.00034	0.00035	0.00035	0.000034	0.00034	0.00034	0.00032	0.00031
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	0.0123	0.0174	<0.005	<0.005	0.0258	<0.005	0.0141	<0.005
Total Zirconium	mg/L			<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Total Calcium	mg/L			47.6	49.2	52.4	46.1	50.5	51.4	52.2	49.5
Total Magnesium	mg/L			15.4	15.3	16.1	15.7	16.2	16.3	15.8	15.7
Total Potassium	mg/L			1.48	1.47	1.53	1.53	1.54	1.48	1.5	1.55
Total Sodium	mg/L	200	AO	27.3	29.6	31.9	32.1	31.7	33.8	33.9	33
Total Sulphur	mg/L			3.1	<3	<3	<3	<3	<3	<3	<3

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