Physical and Chemical Analysis of Water Supply

Greater Vancouver Water District

2014 - Seymour Water System

Parameter	Untreated	Treated				
	Average	Average	Range	Days Guideline Exceeded	Canadian Guideline Limit	Reason Guideline Established
Alkalinity as $CaCO_3$ (mg/L)	3.7	8.1	5.8-10.3		none	
Aluminium Dissolved (µg/L)	64	31	15-61		none	
Aluminium Total (µg/L)	130	36	17-70	0	200	aesthetic
Antimony Total (µg/L)	<0.5	<0.5	<0.5	0	6	health
Arsenic Total (µg/L)	<0.5	<0.5	<0.5	0	10	health
Barium Total (µg/L)	3.9	3	2.9-3.0	0	1000	health
Boron Total (mg/L)	<10	<10	<10		5	
Bromate (mg/L)	<0.01	<0.01	<0.01	0	0.01	health
Bromide (mg/L)	<0.01	<0.01	<0.01	0	none	health
Cadmium Total (µg/L)	<0.2	<0.2	<0.2	0	5	health
Calcium Total (mg/L)	1.8	3.89	3.00-4.58		none	
Carbon Organic Dissolved (mg/L)	1.6	0.67	0.5 - 1.1		none	
Carbon Organic Total (mg/L)	2.00	0.74	0.56 -1.37		none	
Chlorate (mg/L)	<0.01	0.04	0.01 - 0.10	0	1.0	health
Chloride Total (mg/L)	<0.5	<0.5	<0.5	0	≤ 250	aesthetic
Chromium Total (µg/L)	0.08	<0.05	<0.05 - 0.05	0	50	health
Color Apparent (ACU)	18	<1	<1		none	
Color True (TCU)	12	<1	<1	0	≤ 15	aesthetic
Conductivity (umhos/cm)	14	29	22-36		none	
Copper Total (µg/L)	9	<0.5	<0.5	0	≤1000	aesthetic
Cyanide Total (mg/L)	<0.02	<0.02	<0.02	0	0.2	health
Fluoride (mg/L)	<0.05	<0.05	<0.05	0	1.5	health
Hardness as $CaCO_3$ (mg/L)	5.2	10.4	8-12.2		none	
Iron Dissolved (µg/L)	71	<5	<5		none	
Iron Total (µg/L)	211	6	<5-14		≤ 300	aesthetic
Lead Total (µg/L)	<0.5	<0.5	<0.5	0	10	health
Magnesium Total (µg/L)	169	167	125-196		none	
Manganese Dissolved (µg/L)	5.2	4.3	2.3-7.2		none	
Manganese Total (µg/L)	7.3	5.7	2.6-9.6	0	≤ 50	aesthetic
Mercury Total (µg/L)	<0.05	<0.05	<0.05	0	1.0	health
Nickel Total (µg/L)	<0.5	<0.5	<0.5		none	
Nitrogen - Ammonia as N (mg/L)	<0.02	<0.02	<0.02		none	
Nitrogen - Nitrate as N (mg/L)	0.07	0.07	0.01 - 0.11	0	45	health
Nitrogen - Nitrite as N (mg/L)	<0.01	<0.01	<0.01	0	3.0	health
pH	6.6	7.2	7.0-7.4	0	6.5 to 8.5	aesthetic
Phenols (µg/L)	<5	<5	<5		none	
Phosphorus Total (µg/L)	<5	<5	<5		none	
Potassium Total (µg/L)	156	142	140-143		none	
Residue Total (mg/L)	20	24	20-27		none	
Residue Total Dissolved (mg/L)	15	20	14-27	0	≤ 500	aesthetic
Residue Total Fixed (mg/L)	13	18	14-21		none	
Residue Total Volatile (mg/L)	7	6	4-8		none	
Selenium Total (µg/L)	<0.5	<0.5	<0.5	0	50	health
Silica as SiO_2 (mg/L)	3.3	3.3	2.8-3.8		none	
Silver Total (µg/L)	<0.5	<0.5	<0.5		none	
Sodium Total (mg/L)	0.56	1.43	1.22-1.68	0	≤ 200	aesthetic
Sulphate (mg/L)	1.4	2.5	0.9-3.3	0	≤ 500	aesthetic
Turbidity (NTU)	1.21	0.11	0.06-0.22		≤0.3	
Uranium Total (µg/L)	0.022	0.014			20	health
UV254 {cm^{-1} (% Trans)} App					none	
UV254 (cm^{-1}) True	0.071	0.01	0.008-0.016		none	
Zinc Total (µg/L)	<3	<3	<3	0	≤ 5000	aesthetic

These figures are average values from a number of laboratory analyses done throughout the year. Where the range is a single value no variation was measured for the samples analysed. Methods and terms are based on those of "Standard Methods of Water and Waste Water" 22nd Edition 2012. Less than (<) denotes not detectable with the technique used for determination. Untreated water is from the intake or a sample site prior to coagulation, treated water is from a sample site downstream of SCFP clearwell. Guidelines are taken from "Guidelines for Canadian Drinking Water Quality - Sixth Edition" Health and Welfare Canada 1996, updated to Oct 2014. Seymour source water is filtered, disinfected with UV light and sodium hypochlorite for primary disinfection, respectively; lime is added to increase pH and alkalinity while CO_2 is added to adjust pH. Turbidity and pH for raw and treated waters were taken from SCADA. TOC and UV254 (cm^{-1} and % Transmittance) were taken from SCFP WQC Lab data. Seymour Source was operational for 365 days in 2014. In parenthesis ( ) analytical results from a private lab.

Corrections made Aug 5, 2015

Physical and Chemical Analysis of Water Supply

Greater Vancouver Water District

2014 - Capilano Water System

Parameter	Untreated	Treated				
	Average	Average	Range	Days Guideline Exceeded	Canadian Guideline Limit	Reason Guideline Established
Alkalinity as $CaCO_3$ (mg/L)	3.1	3.7	3.2-4.3		none	
Aluminium Dissolved (µg/L)	67	65	56-74		none	
Aluminium Total (µg/L)	88	97	84-110		none	
Antimony Total (µg/L)	<0.5 (0.021)	<0.5	<0.5	0	6	health
Arsenic Total (µg/L)	<0.5 (0.095)	<0.5	<0.5	0	10	health
Barium Total (µg/L)	6.3	2.2	2.2	0	1000	health
Boron Total (mg/L)	<0.01	<0.01	<0.01		5	
Bromate (mg/L)	<0.01	<0.01	<0.01	0	0.01	health
Bromide (mg/L)	<0.01	<0.01	<0.01	0	none	health
Cadmium Total (µg/L)	<0.2 (0.008)	<0.2	<0.2	0	5	health
Calcium Total (mg/L)	1.29	1.28	1.19-1.39		none	
Carbon Organic Dissolved (mg/L)	1.4	1.4	1.1-1.5		none	
Carbon Organic Total (mg/L)	1.3	1.4	1.2-1.5		none	
Chlorate (mg/L)	<0.01	0.08	<0.06-0.10	0	1.0	health
Chloride Total (mg/L)	0.5	2.0	1.8-21	0	≤ 250	aesthetic
Chromium Total (µg/L)	<0.05	<0.05	<0.05	0	50	health
Color Apparent (ACU)	12	8	6-10		none	
Color True (TCU)	8	3	<1-5	0	≤ 15	aesthetic
Conductivity (umhos/cm)	12	18	16-19		none	
Copper Total (µg/L)	32 (0.503)			0	≤ 1000	aesthetic
Cyanide Total (mg/L)	<0.02	<0.02	<0.02	0	0.2	health
Fluoride (mg/L)	<0.05	<0.05	<0.05	0	1.5	health
Hardness as $CaCO_3$ (mg/L)	3.88	3.85	3.62-4.15		none	
Iron Dissolved (µg/L)	45	46	24-75		none	
Iron Total (µg/L)	127	143	66-230	0	≤ 300	aesthetic
Lead Total (µg/L)	<0.5 (0.095)	<0.5	<0.5	0	10	health
Magnesium Total (mg/L)	162	160	154-168		none	
Manganese Dissolved (µg/L)	4.7	3.7	1.9-6.1		none	
Manganese Total (µg/L)	5.5	4.6	2.8-7.2	0	≤ 50	aesthetic
Mercury Total (µg/L)	<0.05	<0.05	<0.05	0	1.0	health
Molybdenum Total (µg/L)	(0.148)					
Nickel Total (µg/L)	<0.5 (0.100)	<0.5	<0.5		none	
Nitrogen - Ammonia as N (mg/L)	0.02	<0.02	<0.02		none	
Nitrogen - Nitrate as N (mg/L)	0.07	0.08	0.07-0.09	0	45	health
Nitrogen - Nitrite as N (mg/L)	<0.01	<0.01	<0.01	0	3.0	health
pH	6.5	6.6	6.6	0	6.5 to 8.5	aesthetic
Phenols (µg/L)	<5	<5	<5		none	
Phosphorus Total (µg/L)	<5	<5	<5		none	
Potassium Total (mg/L)	178	138	138		none	
Residue Total (mg/L)	16	18	16-19		none	
Residue Total Dissolved (mg/L)	12	14	12-16	0	≤ 500	aesthetic
Residue Total Fixed (mg/L)	10	11	10-12		none	
Residue Total Volatile (mg/L)	6	7	6-7		none	
Selenium Total (µg/L)	<0.5 (<0.040)	<0.5	<0.5	0	50	health
Silica as SiO_2 (mg/L)	3.3	3.3	3.3		none	
Silver Total (µg/L)	<0.5 (<0.005)	<0.5	<0.5		none	
Sodium Total (mg/L)	5.66	1.82	1.81-1.83	0	≤ 200	aesthetic
Sulphate (mg/L)	0.8	0.8	0.80	0	≤ 500	aesthetic
Turbidity (NTU)	0.35	0.36	0.20-0.60			
Uranium Total (µg/L)	0.027			0	20	health
UV254 (Abs/cm)	0.055	0.042	0.034-0.053		none	
UV254 App. (Abs/cm)					none	
Zinc Total (µg/L)	<3 (0.91)	<3	<3	0	≤ 5000	aesthetic

These figures are average values from a number of laboratory analyses done throughout the year. Where the range is a single value no variation was measured for the samples analysed. Methods and terms are based on those of "Standard Methods of Water and Waste Water" 22nd Edition 2012. Less than (<) denotes not detectable with the technique used for determination. Untreated water is from the intake prior to chlorination, treated water is from a single site in the GVWD distribution system downstream of chlorination. Guidelines are taken from "Guidelines for Canadian Drinking Water Quality - Sixth Edition" Health and Welfare Canada 1996, updated to Oct 2014. Capilano water is treated with chlorine for primary and secondary disinfections which increases pH and alkalinity. Capilano source was out of service from January 1- May 27, and September 24 -December 31. It was operational for only 119 days in 2014. In parenthesis ( ) analytical results
Corrections made Aug 5, 2015

Physical and Chemical Analysis of Water Supply

Greater Vancouver Water District

2014 - Coquitlam Water System

Parameter	Average	Average	Range	Days Guideline Exceeded	Canadian Guideline Limit	Reason Guideline Established
Alkalinity as $CaCO_3$ (mg/L)	1.8	8.7	6.4-10.4		none	
Aluminium Dissolved (µg/L)	59	58	44-80		none	
Aluminium Total (µg/L)	86	86	69-117		none	
Antimony Total (µg/L)	<0.5	<0.5	<0.5	0	6	health
Arsenic Total (µg/L)	<0.5 (0.026)	<0.5	<0.5	0	10	health
Barium Total (µg/L)	2.33	2.3	2.1-2.4	0	1000	health
Boron Total (mg/L)	<0.01	<0.01	<0.01	0	5	health
Bromate (mg/L)	<0.01	<0.01	<0.01	0	0.01	health
Bromide (mg/L)	<0.01	<0.01	<0.01		none	
Cadmium Total (µg/L)	<0.2 (0.006)	<0.2	<0.2	0	5	health
Calcium Total (mg/L)	0.91	0.91	0.86-0.93		none	
Carbon Organic Dissolved (mg/L)	1.6	1.5	1.1-2.3		none	
Carbon Organic Total (mg/L)	1.58	1.51	1.20-2.30		none	
Chlorate (mg/L)	<0.01	<0.01	<0.01	0	1.0	health
Chloride Total (mg/L)	0.5	2.1	1.9-2.6	0	≤ 250	aesthetic
Chromium Total (µg/L)	<0.05	<0.05	<0.05	0	50	health
Color Apparent (ACU)	13	2	<1-3		none	
Color True (TCU)	9	1	<1-2	0	≤ 15	aesthetic
Conductivity (umhos/cm)	8	28	24-34		none	
Copper Total (µg/L)	5.1	<0.5	<0.5		≤ 1000	aesthetic
Cyanide Total (mg/L)	<0.02	<0.02	<0.02	0	0.2	health
Fluoride (mg/L)	<0.05	<0.05	<0.05	0	1.5	health
Hardness as $CaCO_3$ (mg/L)	2.68	2.67	2.56-2.76		none	
Iron Dissolved (µg/L)	17	19	9-27		none	
Iron Total (µg/L)	49	49	36-73	0	≤ 300	aesthetic
Lead Total (µg/L)	<0.5	<0.5	<0.5		10	health
Magnesium Total (µg/L)	0.10	0.10	0.9-0.11		none	
Manganese Dissolved (µg/L)	3.4	2.3	1.6-3.5		none	
Manganese Total (µg/L)	3.9	3.0	2.1-3.9	0	≤50	aesthetic
Mercury Total (µg/L)	<0.05	<0.05	<0.05	0	1.0	health
Molybdenum Total (µg/L)	0.062					
Nickel Total (µg/L)	<0.5 (0.062)	<0.5	<0.5		none	
Nitrogen - Ammonia as N (mg/L)	<0.02	<0.02	<0.02		none	
Nitrogen - Nitrate as N (mg/L)	0.09	0.1	0.07-0.12	0	45	health
Nitrogen - Nitrite as N (mg/L)	<0.01	<0.01	<0.01	0	3.0	health
pH	6.3	7.5	6.4-8.6	0	6.5 to 8.5	aesthetic
Phenols (µg/L)	<5	<5	<5		none	
Phosphorus Total (µg/L)	<5	<5	<5		none	
Potassium Total (µg/L)	107	113	104-123		none	
Residue Total (mg/L)	13	26	23-28		none	
Residue Total Dissolved (mg/L)	10	22	11-25	0	≤ 500	aesthetic
Residue Total Fixed (mg/L)	8	19	16-21		none	
Residue Total Volatile (mg/L)	5	8	7-9		none	
Selenium Total (µg/L)	<0.5 (<0.040)	<0.5	<0.5	0	50	health
Silica as SiO_2 (mg/L)	2.5	2.5	2.3-2.6		none	
Silver Total (µg/L)	<0.5 (<0.005)	<0.5	<0.5		none	
Sodium Total (mg/L)	0.46	0.50	0.44-0.58	0	≤200	aesthetic
Sulphate (mg/L)	0.7	0.7	0.6-0.7	0	≤500	aesthetic
Turbidity (NTU)	0.49	0.42	0.18-2.5			
Uranium Total (µg/L)	0.039			0	20	health
UV254 (Abs/cm)	0.065	0.019	0.011-0.038		none	
UV254 App (Abs/cm)	0.072	0.024	0.016-0.045			
Zinc Total (µg/L)	<3 (1.54)	<3	<3	0	≤ 5000	aesthetic

These figures are average values from a number of laboratory analyses done throughout the year. Where the range is a single value no variation was measured for the samples analysed. Methods and terms are based on those of "Standard Methods of Water and Waste Water" 22nd Edition 2012. Less than (<) denotes not detectable with the technique used for determination. Untreated water is from the intake prior to chlorination, treated water is from a sample line after 10 minutes chlorine contact time. Guidelines are taken from "Guidelines for Canadian Drinking Water Quality - Sixth Edition" Health and Welfare Canada 1996, updated to Oct 2014. Coquitlam water is treated with ozone for primary disinfection, chlorine for secondary disinfection, soda ash to increase pH and alkalinity. UV disinfection for primary treatment was in service starting June 10th. Coquitlam was operational for 365 days in 2014. In parenthesis ( ) analytical results from a private lab.

Corrections made Aug 5, 2015