



City of Prince Albert Drinking Water Quality and Compliance

The Water Security Agency and Ministry of Environment requires that at least once each year waterworks owners provide notification to consumers of the quality of water produced and supplied as well as information on the performance of the waterworks in submitting samples as required by a Minister's Order or Permit to Operate a Waterworks. The following is a summary of the City of Prince Albert's water quality and sample submission compliance record from January 1, 2022 to December 31, 2022. This report was completed on April 5, 2023. Readers should refer to the Saskatchewan Water Security Agency's [Municipal Drinking Water Quality Monitoring Guidelines, June 2015, EPB 502](#) for more information on minimum sample submission requirements. Permit requirements for a specific waterworks may require more sampling than outlined in the department's monitoring guidelines. If consumers need more information on the nature and significance of specific water tests, for example, "what is the significance of selenium in a water supply", more detailed information is available from: http://www.hc-sc.gc.ca/ewh-semt/pubs/water-eau/index_e.html.

Water Quality Standards

Bacteriological Quality

Parameter/Location	Limit	Regular Samples Required	Regular Samples Submitted	# of Positive Regular Submitted (Percentage)
Total Coliform	0 organisms/100 mL	520	520	1 sample tested positive for total coliforms February 9 = 99.8 % compliance.
E. coli	0 organisms/100 ml			
Background Bacteria	Less than 200 organisms/100 mL			

The owner/operator is responsible to ensure that one hundred percent of all bacteriological samples are submitted as required. Generally, analysis is performed on a single sample for all parameters mentioned above. All waterworks are required to submit samples for bacteriological water quality; the frequency of monitoring depends on the population served by the waterworks. The City of Prince Albert is required to submit eleven (11) bacteriological samples per week for analysis January 1 2022 to June 30, 2022. From July 1 to December 31, 2022 the samples required per week was amended to nine (9).

Water Disinfection – Chlorine Residual for Test Results Submitted with Bacteriological Samples

Parameter	Minimum Limit (mg/L)	Free Chlorine Residual Range	Total Chlorine Residual Range	# Tests Required	# Tests Submitted	# Adequate Chlorine (%)
Chlorine Residual in Distribution System	0.1 mg/L free OR 0.5 mg/L total	0.36 mg/l to 1.82 mg/l	0.40 mg/l to 2.18 mg/l	520	520	(100%)

*A minimum of 0.1 milligrams per litre (mg/L) free chlorine residual **OR** 0.5 mg/L total chlorine residual is required at all times throughout the distribution system unless otherwise approved. A proper chlorine submission is defined as a bacteriological sample submission form with both the free and total chlorine residual fields filled out. Adequate chlorine is a result that indicates that the chlorine level is above the regulated minimums. Adequate chlorine may be counted even if the chlorine results were submitted incorrectly. A waterworks is required to submit chlorine residual test results on every bacteriological sample they submit.*

Water Disinfection – Free Chlorine Residual of the water leaving the River Street Reservoir – From Water Treatment Plant Records

Parameter	Limit (mg/L)	Test Level Range	# Tests Performed	# Tests Not Meeting Requirements
Free Chlorine Residual	0.10	0.59 mg/l to 1.64 mg/l	Continuous on line monitoring & grab samples	0

A minimum of 0.1 milligrams per litre (mg/L) free chlorine residual is required for water leaving the River Street Reservoir before the next chlorine injection point. Potable water is monitored continuously for free chlorine residual and tests are normally performed on a daily basis by the waterworks operators and are recorded into the operation records. This data includes the number of free chlorine residual tests performed, the overall range of free chlorine residual (highest and lowest recorded values) and the number of tests and percentage of results not meeting the minimum requirement of 0.1 mg/L free chlorine residual.

Turbidity

Parameter	Limit (NTU)	Test Level Range	# Tests Not Meeting Requirements	Maximum Turbidity (NTU)	# Tests Required
Filter A Turbidity	1.0	0.017 - 0.30	0	0.30	Continuous Monitoring & grab sample comparisons
Filter B Turbidity	1.0	0.017 - 0.30	0	0.30	Continuous Monitoring & grab sample comparisons
Filter C Turbidity	1.0	0.002 - 0.30	0	0.30	Continuous Monitoring & grab sample comparisons
Filter D Turbidity	1.0	0.002 - 0.30	0	0.30	Continuous Monitoring & grab sample comparisons
Filter E Turbidity	1.0	0.012 - 0.30	0	0.30	Continuous Monitoring & grab sample comparisons
Filter F Turbidity	1.0	0.012 - 0.30	0	0.30	Continuous Monitoring & grab sample comparisons
Filter G Turbidity	1.0	0.014 - 0.30	0	0.30	Continuous Monitoring & grab sample comparisons
Filter H Turbidity	1.0	0.013 - 0.30	0	0.30	Continuous Monitoring & grab sample comparisons
Water entering the Distribution	5.0	0.04 – 0.52	0	0.52	Continuous Monitoring & grab sample comparisons

Turbidity is a measure of water treatment efficiency. Turbidity measures the “clarity” of the drinking water and is generally reported in Nephelometric Turbidity Units (NTU). All waterworks are required to monitor turbidity at the water treatment plant. The frequency of measurement varies from daily for small systems to continuous for larger waterworks. The City of Prince Albert is required to continuously monitor the filter effluent from each filter.

“<” means less than

Chemical – Health Category			June 10, 2022	July 18, 2022	Oct 19, 2022	Samples Exceeding MAC/IMAC	# Samples Required	# Samples Submitted
Parameter	Limit MAC (mg/L)	Limit IMAC (mg/L)	Sample Results (mg/l)	Sample Results (mg/l)	Sample Results (mg/l)			
Aluminum			0.043	0.068	0.0531	0	2 per year	3
Antimony	0.006		0.00016	0.00018	<0.00010	0	2 per year	3
Arsenic	0.010		0.00030	0.00017	0.00014	0	2 per year	3
Barium	1.0		0.0741	0.0652	0.0500	0	2 per year	3
Beryllium	no current standard		<0.000020	<0.00020	<0.00020	0	0 per year	3
Boron		5.0	0.059	0.029	0.024	0	2 per year	3
Cadmium	0.005		0.0000100	0.0000158	0.0000084	0	2 per year	3
Chromium	0.050		<0.00050	<0.00050	<0.00050	0	2 per year	3
Cobalt	no current standard		<0.00010	<0.00010	<0.00010	0	0 per year	3
Copper	2 mg/l		0.0109	0.0275	0.00096	0	2 per year	3
Fluoride (avg.*)	1.5 mg/l		Max result = 1.19 mg/l; Average for Year = 0.67 mg/l			0	417	765
Iron	Aesthetic objective	0.3 mg/l	<0.010	<0.010	<0.010	0	2 per year	3
Lead	0.005		0.000064	0.000481	<0.000050	0	2 per year	3
Manganese	0.05 mg/l		0.00571	<0.00500	<0.00500	0	2 per year	3
Molybdenum	no current standard		0.00161	0.000815	0.00112	0	0 per year	3
Nickel	no current standard		0.00188	0.00162	0.00072	0	0 per year	3
Nitrate-N	10		<0.020	0.020	0.184	0	0 per year	3
Nitrite-N	1.0		<0.010	<0.010	<0.010	0	0 per year	3
Selenium	0.010		0.000189	0.000303	0.000162	0	2 per year	3
Silver	no current standard		<0.000010	<0.000010	<0.000010	0	2 per year	3
Thallium	no current standard		<0.000010	0.000012	<0.000010	0	0 per year	3
Uranium	0.020		0.000165	0.000026	0.000165	0	2 per year	3
Zinc	Aesthetic objective	5 mg/l	0.0045	0.0039	<0.0030	0	2 per year	3

Substances within the chemical health category may be naturally occurring in drinking water sources or may be the result of human activities. These substances may represent a long-term health risk if the Maximum Acceptable Concentration (MAC) or Interim Maximum Acceptable Concentration (IMAC) is exceeded. All drinking water supplies are required to monitor for substances in the “Chemical-Health” category, the frequency of monitoring depends on the population served by the waterworks. Some waterworks add fluoride to drinking water as a means to aid in the prevention of dental decay.

* Results expressed as average values for communities or waterworks which fluoridate drinking water supplies or those with elevated concentrations of fluoride or nitrates.

Chemical – Cyanide and Mercury

Parameter	Limit MAC (mg/L)	June 9, 2022 Sample Results	July 18, 2022 Sample Results	# Samples Exceeding MAC	# Samples Required	# Samples Submitted
Cyanide	0.200	<0.005	<0.005	0	2 per year	2
Mercury	0.001	<0.000005	<0.000005	0	2 per year	2

“<” means less than

Mercury enters water supplies naturally and as a result of human activities. Cyanide can enter source waters as a result of industrial effluent or spill events. These substances may represent a long-term health risk if the Maximum Acceptable Concentration (MAC) is exceeded. Mandatory sampling requirements depend on the population served by the waterworks.

Chemical – Pesticides

Parameter	Limit MAC(mg/L)	Limit IMAC (mg/L)	July 6, 2022	Samples Exceeding MAC/IMAC	# Samples Required	# Samples Submitted
			Sample Results (mg/l)			
Atrazine		0.005	<0.00010	0	1 every 2 years	1
Bromoxynil		0.005	<0.000010	0	1 every 2 years	1
Carbofuran	0.09		<0.00020	0	1 every 2 years	1
Chlorpyrifos	0.09		<0.00010	0	1 every 2 years	1
Dicamba	0.12		<0.00010	0	1 every 2 years	1
2,4-D*		0.1	<0.0000532	0	1 every 2 years	1
Diclofop-methyl	0.009		<0.00010	0	1 every 2 years	1
Dimethoate		0.02	<0.00010	0	1 every 2 years	1
Malathion	0.19		<0.00010	0	1 every 2 years	1
MCPA	0.10		<0.00010	0	1 every 2 years	1
Pentachlorophenol	0.06		<0.00050	0	1 every 2 years	1
Picloram		0.19	<0.000020	0	1 every 2 years	1
Trifluralin		0.045	<0.00010	0	1 every 2 years	1

Pesticides in drinking water may occur as a result of the use of these substances by humans. These substances may represent a long-term health risk if the Maximum Acceptable Concentration (MAC) or Interim Maximum Acceptable Concentration (IMAC) is exceeded. Mandatory sampling requirements depend on the population served by the waterworks.

Chemical – Trihalomethanes & Haloacetic Acids – Samples submitted February 16, May 4, July 22 & October 19, 2022

Parameter	Limit (mg/L)	Sample Result (average)	# Samples Required	# Samples Submitted
Trihalomethanes	0.100	0.0570	8 (two every 3 months)	9
Haloacetic Acids	0.080	0.0308	8 (two every 3 months)	9

Trihalomethanes and Haloacetic Acids are generated during the water disinfection process, a by-product of reactions between chlorine and organic material. Trihalomethanes are generally found only in drinking water obtained from surface water supplies. Trihalomethanes and Haloacetic Acids are to be monitored on a quarterly basis and the Maximum Acceptable Concentration is expressed as an average of 4 quarterly samples. Only water supplies derived from surface water or groundwater under the influence of surface water are required to monitor Trihalomethane and Haloacetic Acids unless otherwise specified in the waterworks permit to operate.

General Chemical

(February 15, June 10, July 18, October 19, 2022)

Parameter	Aesthetic Objectives* (mg/L)	Sample Results (average mg/l)	# Samples Required	# Samples Submitted
T – Alkalinity (as CaCO ₃)	500	130	4 per year	4
Bicarbonate	No Objective	159	4 per year	4
Dissolved Calcium	No Objective	49.1	4 per year	4
Carbonate	No Objective	<1.0	4 per year	4
Chloride	250	37.4	4 per year	4
Conductivity	No Objective	504 uS/cm	4 per year	4
Hardness mg CaCO ₃ /L	800	196	4 per year	4
Dissolved Magnesium	200	17.8	4 per year	4
Potassium	No Objective	3.83	Supplementary Sampling	4
PH	No Objective	7.58	4 per year	4
Dissolved Sodium	300	25	4 per year	4
Sulphate	500	71.7	4 per year	4
Total dissolved solids	1500	288	4 per year	4

All waterworks serving more than 5000 persons are required to submit water samples for the General Chemical category as per their permit to operate. The General Chemical category includes analysis for alkalinity, bicarbonate, calcium, carbonate, chloride, conductivity, hardness (as CaCO₃), magnesium, sodium, sulphate and total dissolved solids. The last sets of quarterly samples for General Chemical analysis were required to be submitted (Jan-March, April-June, July-September, October-December of 2022). Sample results indicated that there were no exceedances of the provincial aesthetic objectives for the General Chemical category.

**Objectives apply to certain characteristics of or substances found in water for human consumptive or hygienic use. The presence of these substances will affect the acceptance of water by consumers and/or interfere with the practice of supplying good quality water. Compliance with drinking water aesthetic objectives is not mandatory as these objectives are in the range where they do not constitute a health hazards. The aesthetic objectives for several parameters (including hardness as CaCO₃, magnesium, sodium and total dissolved solids) consider regional differences in drinking water sources and quality.*

Cryptosporidium & Giardia – For Raw Untreated River Water

Yearly Sampling requirements depend on permit specific requirements. The Raw river water sampling outlined in the City of Prince Alberts Permit to Operate a Waterworks, was conducted April 25 & September 15, 2022.

Microcystin-LR and/or Total Microcystin Toxins

Parameter	Limit MAC (mg/l)	June 9 Sample Results	July 6 Sample Results	August 9 Sample Results	September 15 Sample Results	October 19 Sample Results	# Samples Exceeding Limit	# Samples Required	# Samples Submitted
Microcystin	0.0015	<0.00020	no result	<0.00020	<0.00020	<0.00020	0	(variable)	5
			<i>“<” means less than</i>			during algal bloom period			

Sampling requirements depend on permit specific requirements. The July 6 sample was submitted to the certified laboratory. The laboratory lost the sample and it was not tested. The Water Security Agency was informed of the laboratory mistake.

Radiological

Parameter	November 16, 2022				
	Limit Becquerels/L	Sample Results	# Samples Exceeding Limit	# Samples Required	# Samples Submitted
Gross Alpha	0.50	<0.16	0	1 per year	1
Gross Beta	1.0	0.12	0	1 per year	1

“<” means less than

Radiological constituents in drinking water may be the result of natural conditions or as a result of human activities. Gross alpha and Gross Beta are initial water quality screening tests used to determine the overall quality of drinking water for a larger set of specific radiological parameters. Further sampling may be required if Gross Alpha or Beta exceedences are found. Sampling requirements depend on permit specific requirements.

Parameter	“< means less than” August 10, 2022					
	Limit MAC (mg/L)	Limit IMAC (mg/L)	Sample Results (mg/l)	# Samples Exceeding Limit	# Samples Required	# Samples Submitted
Carbon Tetrachloride	0.005		<0.00050	0	1	1
1,2 Dichlorobenzene	0.200		<0.00050	0	1	1
1,4 Dichlorobenzene	0.005		<0.00050	0	1	1
1,2 Dichloroethane		0.005	<0.00050	0	1	1
1,1 Dichloroethylene	0.014		<0.00050	0	1	1
Dichloromethane	0.050		<0.0010	0	1	1
2,4 Dichlorophenol	0.900		<0.000532	0	1	1
Monochlorobenzene	0.080		<0.00050	0	1	1
Perfluorooctane Sulfonate	0.0006		<0.00050	0	1	1
Perfluorooctanoic Acid	0.0002		<0.000001	0	1	1
2,3,4,6 Tetrachlorophenol	0.100		<0.00050	0	1	1
Trichloroethylene	0.050		<0.00050	0	1	1
2,4,6 Trichlorophenol	0.005		<0.00050	0	1	1
Vinyl Chloride	0.002		<0.00050	0	1	1

The sample was submitted for analysis on August 10, 2022. Contamination of drinking water by synthetic organic chemicals only results from pollution events. Contamination of drinking water in excess of Maximum Acceptable Concentration (MAC) or Interim Maximum Acceptable Concentration (IMAC) may represent a health risk. Mandatory sampling requirements depends on the population served by the waterworks.

More information on water quality and sample submission performance may be obtained from:

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