



**Drinking Water Quality and Compliance**  
**SaskWater Gravelbourg Water Supply System**  
**2019 Notification to Consumers**

The Water Security Agency (WSA) 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 Permit to Operate a waterworks. The following is a summary of the SaskWater Gravelbourg Water Supply System water quality and sample submission compliance record for the January 1, 2019 to December 31, 2019 time period. This report was completed on February 10, 2020. Readers should refer to the WSA's Municipal Drinking Water Quality Monitoring Guidelines, October 2012, EPB 202 for more information on minimum sample submission requirements and types of samples. Permit requirements for a specific waterworks may require more sampling than outlined in the Agency's monitoring guidelines. If consumers need to know more about drinking water in Saskatchewan, more detailed information is available from: <http://www.hc-sc.gc.ca/ewh-semt/pubs/water-eau/index-eng.php>.

**BACTERIOLOGICAL QUALITY**

Parameter	Limit	Regular Samples Required	Required Samples Submitted	# of Positive Regular Samples Submitted
Total Coliform	0 Organisms/100 mL	52	52	0
E. Coli	0 Organisms/100 mL	52	52	0
Background Bacteria	Less than 200/100 mL	52	52	0

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.

**WATER DISINFECTION**

**Chlorine Residual for Water Entering Distribution System – From results submitted with Bacteriological Samples**

Parameter	Minimum Limit (either/or)	Range (mg/L)	# Tests Required	# Tests Submitted	# Adequate Chlorine
Free Chlorine	0.1 mg/L	0.60 – 1.05	52	52	52
Total Chlorine	0.5 mg/L	0.70 – 1.10	52	52	

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. Adequate chlorine is a result that indicates that the chlorine level is above the regulated minimums. A waterworks is required to submit chlorine residual test results on every bacteriological sample they submit.

**Gravelbourg Water Supply System**

**Free Chlorine Residual for Water Entering Distribution System**

Parameter	Limit (mg/L)	Range (mg/L)	# Tests Required	# Tests Performed	% Adequate Chlorine
Free Chlorine	At least 0.1	0.45 – 1.33	730	Continuous	100

Residuals are continuously monitored and recorded. Tests performed daily by waterworks operators are recorded in operation records.

**TURBIDITY**

**Turbidity for Water Entering Distribution System – From Test Results Submitted with Bacteriological Samples**

Parameter	Limit (NTU)	Range (NTU)	# Tests Required	# Tests Performed	# Exceeding Limit
Turbidity	No standard	0.03 – 0.15	52	52	0

**Turbidity for Water Leaving the Nanofiltration Unit**

Parameter	Limit (NTU)	Range (NTU)	95 <sup>th</sup> Percentile (NTU)	# Tests Required	# Tests Performed	# Exceeding Limit
Turbidity (Membrane Filtration)	<0.1 – 95% of time and; never > 0.3	0.011 – 0.275	0.035	Continuous	Continuous	0

Turbidity is continuously monitored and recorded. Tests are performed on a daily basis by waterworks operators and are recorded in operation records.

**Turbidity for Water Entering the Distribution System**

Parameter	Limit (NTU)	Range (NTU)	Average (NTU)	# Tests Required	# Tests Performed	# Exceeding Limit
Turbidity	No Standard	0.02 – 0.15	0.06	730	730	0

Turbidity is a measure of water treatment efficiency. Turbidity measures the “clarity” of the drinking water and is reported in Nephelometric Turbidity Units (NTU). All waterworks are required to monitor turbidity at the water treatment plant. The turbidity is done daily with bench testing instrument, as well as continuously with an on-line analyzer.

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**CONDUCTIVITY**

**For Water Leaving the Nanofiltration Unit**

Parameter	Limit	Range	# Tests Required	# Tests Submitted	# Exceeding Objective
Conductivity (µs/cm)	No Standard	10.8 – 208.8	Continuous	Continuous	0

Conductivity is monitored continuously and tests normally performed on a daily basis by waterworks operators and are recorded in operation records.

**pH**

**For Water Entering the Distribution System**

Parameter	Objective	Range	# Tests Required	# Tests Submitted	# Outside of Objective
pH	6.5 – 9.0	6.45 – 9.06	365	365	3

The pH was in the range for 362 of the 365 tests performed. The one result below the required limit was 6.45. The two results above the 9.0 limit were 9.05 and 9.06. The EPO was notified.

**CHEMICAL – GENERAL**

Gravelbourg Water Supply System is required to submit water samples for the WSA's General Chemical category once per three months every second year. 2019 is not a required sampling year. Additional sampling was done for informational purposes.

Parameter	MAC	AO *	Sample Results	# of Samples Required	# of Samples Submitted
Total Alkalinity (mg/L)		500	22.6	0	4
Bicarbonate (mg/L)	No Objective		26	0	4
Calcium (mg/L)	No Objective		<1	0	4
Carbonate (mg/L)	No Objective		1	0	4
Chloride (mg/L)		250	2.6	0	4
Fluoride (mg/L)	1.5		<0.05	0	4
Total Hardness (mg/L)		800	7	0	4
Hydroxide (mg/L)	No Objective		0	0	4
Magnesium (mg/L)		200	<1	0	4
Nitrate (mg/L)	45		0.6	0	4
pH (pH units)		6.5 - 9.0	8.4	0	4
Potassium (mg/L)	No Objective		<1	0	4
Sodium (mg/L)		300	13	0	4
Specific Conductivity (µs/cm)	No Objective		77	0	4
Sulphate (mg/L)		500	10.5	0	4
Total Dissolved Solids (mg/L)		1500	56	0	4

MAC – Maximum Acceptable Concentration

AO – Aesthetic Objective

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**CHEMICAL – HEALTH**

Gravelbourg Water Treatment Plant is required to submit water samples for the WSA’s Chemical Health category once every 2 years. 2019 is not a required sampling year. Additional sampling was done for informational purposes.

Parameter	MAC (mg/L)	IMAC (mg/L)	AO* (mg/L)	Sample Results (mg/L)	# of Samples Required	# of Samples Submitted
Aluminum		No Objective		<0.00696	0	4
Antimony	0.006			<0.00016	0	4
Arsenic	0.010			0.00025	0	4
Barium	1.0			<0.00071	0	4
Boron		5.0		0.1	0	4
Cadmium	0.005			<0.00015	0	4
Chromium	0.05			<0.00019	0	4
Copper			1.0	<0.00829	0	4
Iron			0.3	<0.1	0	4
Lead	0.01			0.00010	0	4
Manganese			0.05	<0.01	0	4
Selenium	0.01			<0.00113	0	4
Silver		No Objective		<0.00020	0	4
Uranium	0.02			<0.00011	0	4
Zinc			5	<0.00400	0	4

MAC – Maximum Acceptable Concentrations

AO – Aesthetic Objective

IMAC – Interim Maximum Acceptable Concentrations

\*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 CaCO<sub>3</sub>, magnesium, sodium and total dissolved solids) consider regional differences in drinking water sources and quality.

**CHEMICAL – TRIHALOMETHANES (THM)**

Trihalomethanes are formed when chlorine reacts with organic matter in water. The four THM compounds are: chloroform, dibromochloromethane, bromodichloromethane (BCDM) and bromoform. The sum of the concentrations of these four components is referred to as Total Trihalomethanes. The limit for THM is a long term objective based on an annual average of seasonal samples.

Parameter	Limit (mg/L)	Average (mg/L)	# Samples Required	# Samples Submitted
Trihalomethane	0.100 mg/L	0.012	4	4

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**CHEMICAL – HALOACETIC ACIDS (HAAs)**

Haloacetic acids are formed when chlorine reacts with organic matter in water. The five regulated haloacetic acids are: monochloroacetic acid, dichloroacetic acid, trichloroacetic acid, monobromoacetic acid, and dibromoacetic acid. The sum of the concentrations of these five components is referred to as HAA5. The limit for HAAs is a long term objective based on an annual average of quarterly samples.

<b>Parameter</b>	<b>Limit (mg/L)</b>	<b>Average (mg/L)</b>	<b># Samples Required</b>	<b># Samples Submitted</b>
Haloacetic Acids 5	0.080	<0.009	4	4

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

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