



Drinking Water Quality and Compliance
SaskWater Wakaw-Humboldt
Potable Water Supply System and Treatment Plant
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 Wakaw-Humboldt Regional Water Supply System (RWSS) and Treatment Plant 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 Submitted |
|---------------------|----------------------|--------------------------|----------------------------|---------------------------------|
| Total Coliform | 0 Organisms/100 mL | 156 | 156 | 0 |
| E. Coli | 0 Organisms/100 mL | 156 | 156 | 0 |
| Background Bacteria | Less than 200/100 mL | 156 | 156 | 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 in Distribution System – From Test 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 | 0.44 – 2.13 | 156 | 156 | 156 |
| Total Chlorine | 0.5 mg/L | 0.68 – 2.23 | 156 | 156 | |

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. An 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.

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 1.3 | 1.22 – 2.39 | Continuous | Continuous | 99.6 |

Low residuals occurred on May 9, May 25, and July 23, 2019. The only occurrence that lasted more than two hours was on May 25, where it was below 1.3 mg/L for 6 hours and the minimum of 1.22 mg/L was reached. The EPO was notified.

Residuals are monitored continuously and multiple tests are performed on a daily basis by waterworks operators and are recorded in operation records.

Wakaw-Humboldt Water Supply System

TURBIDITY

Turbidity for Water Leaving the Filter

| Parameter | Limit (NTU) | Range (NTU) | 95 th Percentile (NTU) | # Tests Required | # Tests Performed | # months Exceeding Limit |
|-----------|---|---------------|-----------------------------------|------------------|-------------------|--------------------------|
| Turbidity | < 0.30 – 95% of time each month and; not to be > 0.3 for > 12 consecutive hours; never >1.0 | 0.023 – 0.320 | 0.068 | Continuous | Continuous | 0 |

Turbidity in the Distribution System – From Test Results Submitted with Bacteriological Samples

| Parameter | Limit (NTU) | Range (NTU) | # Tests Required | # Tests Performed | # Exceeding Limit |
|-----------|-------------|-------------|------------------|-------------------|-------------------|
| Turbidity | No standard | 0.04 – 0.23 | 156 | 156 | 0 |

Turbidity in Water Entering the Distribution System

| Parameter | Limit (NTU) | Range (NTU) | Average (NTU) | # Tests Required | # Tests Performed | # Exceeding Limit |
|-----------|-------------|-------------|---------------|------------------|-------------------|-------------------|
| Turbidity | No standard | 0.01 – 0.20 | 0.09 | Continuous | Continuous | 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 analyser.

FLUORIDE

From Treated Water at the Water Treatment Plant

| Parameter | Limit (mg/L) | Average (mg/L) | Maximum (mg/L) | # Samples Required | # Samples Submitted | # Exceeding Limit |
|-----------|--------------|----------------|----------------|--------------------|---------------------|-------------------|
| Fluoride | 1.5 | 0.52 | 1.05 | 365 | 718 | 0 |

Additional testing was done for informational purposes.

From Water in the Distribution System – From Test Results Submitted with Bacteriological Samples

| Parameter | Limit (mg/L) | Average (mg/L) | Maximum (mg/L) | # Samples Required | # Samples Submitted | # Exceeding Limit |
|-----------|--------------|----------------|----------------|--------------------|---------------------|-------------------|
| Fluoride | 1.5 | 0.39 | 0.50 | 52 | 51 | 0 |

The fluoride sample was missed the week of July 15, 2019. The EPO was notified.

Wakaw-Humboldt Water Supply System

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.

| Parameter | Limit (mg/L) | Average (mg/L) | # Samples Required | # Samples Submitted |
|------------------|--------------|----------------|--------------------|---------------------|
| Haloacetic Acids | 0.080 | 0.043 | 8 | 8 |

TRIHALOMETHANES (THM)

Trihalomethanes are formed when chlorine reacts with organic matter in water. The four THM compounds are: chloroform, dibromochloromethane, bromodichloromethane (BDCM) 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 | 0.053 | 8 | 8 |

CHEMICAL – GENERAL

SaskWater Wakaw-Humboldt Potable Water Supply System is required to submit water samples for the WSA's General Chemical category once per three months every year.

| Parameter | MAC (mg/L) | AO * (mg/L) | Sample Results | # of Samples Required | # of Samples Submitted |
|-------------------------------|--------------|-------------|----------------|-----------------------|------------------------|
| Total Alkalinity (mg/L) | | 500 | 130 | 4 | 4 |
| Bicarbonate (mg/L) | No Objective | | 158 | 4 | 4 |
| Calcium (mg/L) | No Objective | | 45 | 4 | 4 |
| Carbonate (mg/L) | No Objective | | <1 | 4 | 4 |
| Chloride (mg/L) | | 250 | 16 | 4 | 4 |
| Fluoride (mg/L) | 1.5 | | 0.40 | 4 | 4 |
| Total Hardness (mg/L) | | 800 | 183 | 4 | 4 |
| Hydroxide (mg/L) | No Objective | | <1 | 4 | 4 |
| Magnesium (mg/L) | | 200 | 17 | 4 | 4 |
| Nitrate (mg/L) | 45 | | 1.7 | 4 | 4 |
| pH (pH units) | | 6.5 - 9.0 | 7.92 | 4 | 4 |
| Potassium (mg/L) | No Objective | | 3.9 | 4 | 4 |
| Sodium (mg/L) | | 300 | 28 | 4 | 4 |
| Specific Conductivity (µs/cm) | No Objective | | 478 | 4 | 4 |
| Sulphate (mg/L) | | 500 | 93 | 4 | 4 |
| Sum of Ions | No Objective | | 362 | 4 | 4 |
| Total Dissolved Solids (mg/L) | | 1500 | 281 | 4 | 4 |

MAC – Maximum Acceptable Concentration

AO – Aesthetic Objective

Wakaw-Humboldt Water Supply System

CHEMICAL – HEALTH

SaskWater Wakaw-Humboldt Potable Water Supply System is required to submit water samples for the WSA's Chemical Health category once every year.

| Parameter | MAC (mg/L) | IMAC (mg/L) | AO * | Sample Results (mg/L) | # of Samples Required | # of Samples Submitted |
|-----------|------------|--------------|------|-----------------------|-----------------------|------------------------|
| Aluminum | | No Objective | | 0.021 | 1 | 1 |
| Antimony | 0.006 | | | <0.0002 | 1 | 1 |
| Arsenic | 0.010 | | | 0.0002 | 1 | 1 |
| Barium | 1.0 | | | 0.070 | 1 | 1 |
| Boron | | 5.0 | | 0.03 | 1 | 1 |
| Cadmium | 0.005 | | | 0.00001 | 1 | 1 |
| Chromium | 0.05 | | | <0.0005 | 1 | 1 |
| Copper | | | 1.0 | 0.0024 | 1 | 1 |
| Iron | | | 0.3 | 0.0011 | 1 | 1 |
| Lead | 0.01 | | | 0.0001 | 1 | 1 |
| Manganese | | | 0.05 | <0.0005 | 1 | 1 |
| Selenium | 0.01 | | | 0.0005 | 1 | 1 |
| Silver | | No Objective | | <0.00005 | 1 | 1 |
| Uranium | 0.02 | | | 0.0005 | 1 | 1 |
| Zinc | | | 5 | 0.0010 | 1 | 1 |

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. Compliance with drinking water aesthetic objectives (AO) is not mandatory as these objectives are in the range where they do not constitute a health hazards. The AO for several parameters (including hardness, magnesium, sodium and total dissolved solids) consider regional differences in sources and quality.

CYANIDE AND MERCURY

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.

| Parameter | Limit (mg/L) | Sample Results (mg/L) | # Samples Required | # Samples Submitted |
|-----------|--------------|-----------------------|--------------------|---------------------|
| Cyanide | 0.2 | 0.004 | 1 | 1 |
| Mercury | 0.001 | <0.000001 | 1 | 1 |

Wakaw-Humboldt Water Supply System

CHEMICAL – PESTICIDES

SaskWater Wakaw-Humboldt Potable Water Supply System is required to submit water samples for the WSA's Pesticide category once every 2 years. 2019 is not a required sampling year. The 2018 results are included below for informational purposes.

| Parameter | MAC (mg/L) | IMAC (mg/L) | 2018 Sample Results (mg/L) | # of Samples Required | # of Samples Submitted |
|-------------------|-------------|-------------|----------------------------|-----------------------|------------------------|
| Atrazine | | 0.005 | <0.0002 | 0 | 0 |
| Bromoxynil | | 0.005 | <0.001 | 0 | 0 |
| Carbofuran | 0.09 | | <0.0002 | 0 | 0 |
| Chlorpyrifos | 0.09 | | <0.0002 | 0 | 0 |
| Dicamba | 0.12 | | <0.001 | 0 | 0 |
| 2, 4-D | | 0.10 | <0.001 | 0 | 0 |
| Diclofop-methyl | 0.009 | | <0.001 | 0 | 0 |
| Dimethoate | | 0.02 | <0.002 | 0 | 0 |
| Malathion | 0.19 | | <0.0002 | 0 | 0 |
| MCPA | No standard | | <0.001 | 0 | 0 |
| Pentachlorophenol | 0.06 | | <0.0005 | 0 | 0 |
| Picloram | | 0.19 | <0.001 | 0 | 0 |
| Trifluralin | | 0.045 | <0.0002 | 0 | 0 |

MAC – Maximum Acceptable Concentrations

IMAC – Interim Maximum Acceptable Concentrations

MICROCYSTIN LR and/or TOTAL MICROCYSTIN TOXINS

SaskWater Wakaw-Humboldt Potable Water Supply System is required to sample for microcystin once every month from the treated water at the water treatment plant during the algal bloom period.

| Parameter | Limit (mg/L) | Average (mg/L) | # Samples Required | # Samples Submitted |
|-------------|--------------|----------------|--------------------|---------------------|
| Microcystin | No Standard | <0.0001 | 4 | 4 |

CHEMICAL – ORGANICS

SaskWater Wakaw-Humboldt Potable Water Supply System is required to submit water samples for the WSA's Synthetic Organic category once every 2 years. 2019 is not a required sampling year. The 2018 results are included below for informational purposes.

| Parameter | MAC (mg/L) | IMAC (mg/L) | AO* (mg/L) | 2018 Sample Results (mg/L) | # of Samples Required | # of Samples Submitted |
|---------------------------|------------|-------------|------------|----------------------------|-----------------------|------------------------|
| Benzene | 0.005 | | | <0.0002 | 0 | 0 |
| Benzo(a)pyrene | 0.00001 | | | <0.00001 | 0 | 0 |
| Carbon tetrachloride | 0.005 | | | <0.002 | 0 | 0 |
| Dichlorobenzene 1,2 | 10.2 | | | <0.0005 | 0 | 0 |
| Dichlorobenzene 1,4 | 0.005 | | | <0.0005 | 0 | 0 |
| Dichloroethane 1,2 | | 0.005 | | <0.0005 | 0 | 0 |
| Dichloroethylene 1,1 | 0.014 | | | <0.0005 | 0 | 0 |
| Dichloromethane | 0.05 | | | <0.0005 | 0 | 0 |
| Dichlorophenol 2,4 | 0.9 | | | <0.0002 | 0 | 0 |
| Ethylbenzene | | | 0.0024 | <0.0002 | 0 | 0 |
| Monochlorobenzene | 0.080 | | | <0.0005 | 0 | 0 |
| Tetrachlorophenol 2,3,4,6 | 0.10 | | | <0.001 | 0 | 0 |
| Toluene | 0.05 | | | <0.0002 | 0 | 0 |
| Trichloroethylene | | | 0.024 | <0.0005 | 0 | 0 |
| Trichlorophenol 2,4,6 | 0.005 | | | <0.002 | 0 | 0 |
| Vinyl Chloride | 0.002 | | | <0.0005 | 0 | 0 |
| Xylene | | | 0.3 | <0.0002 | 0 | 0 |

MAC – Maximum Acceptable Concentrations

AO – Aesthetic Objective

IMAC – Interim Maximum Acceptable Concentrations

Wakaw-Humboldt Water Supply System

RADIOLOGICAL

Gross alpha and beta activity is a measure of radioactivity within water. The activity is the frequency of release of alpha and beta particles after the nuclear decay of radionuclides. Should gross alpha or beta activity exceed a particular standard, further testing is required to identify the specific radionuclides present in water. Radionuclides can enter water from both natural sources and human activities.

| Parameter | Limit (Bq/L) | Result (Bq/L) | # Samples Required | # Samples Submitted |
|------------------|---------------------|----------------------|---------------------------|----------------------------|
| Gross alpha | 0.5 | <0.16 | 1 | 1 |
| Gross beta | 1.0 | 0.12 +/- 0.03 | 1 | 1 |

GIARDIA AND CRYPTOSPORIDIUM – RAW WATER

SaskWater Wakaw-Humboldt Potable Water Supply System is required to sample from the raw water entering the water treatment plant for giardia & cryptosporidium semi-annually (early spring and fall) and following upsets or significant events that may affect raw water quality.

| Parameter | Limit | Average (cysts or oocysts / 100 L) | # Samples Required | # Samples Submitted |
|------------------|--------------|---|---------------------------|----------------------------|
| Giardia | No Standard | 1.3 (cysts) | 2 | 2 |
| Cryptosporidium | No Standard | 0.0 (oocysts) | 2 | 2 |

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

SaskWater
200-111 Fairford Street East
Moose Jaw SK S6H 1C8
Toll Free: 1-888-230-1111
Fax: 306-694-3207
Email: customerservice@saskwater.com