

**Drinking Water Quality and Compliance
Lac La Ronge Regional Water Corporation
Regional 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 Minister's Order or Permit to Operate. The following is a summary of the Lac La Ronge Regional Water Corporation (LLRWC) Regional Water Supply System 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 MOE'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 department's monitoring guidelines. If consumers need to 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 | Regular Samples Submitted | # Positive of Regular Submitted |
|---------------------|----------------------|--------------------------|---------------------------|---------------------------------|
| Total Coliform | 0 Organisms/100 mL | 104 | 104 | 0 |
| E. Coli | 0 Organisms/100 mL | 104 | 104 | 0 |
| Background Bacteria | Less than 200/100 mL | 104 | 104 | 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 | 0.36 – 1.43 | 104 | 104 | 104 |
| Total Chlorine | 0.5 mg/L | 0.69 – 1.84 | 104 | 104 | |

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 0.22 | 0.48 – 1.56 | Continuous | Continuous | 100 |

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

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PRESSURE DECAY TESTING

Testing done daily on each UF Bank recorded as log removal values

| Parameter | Limit | Range | # Tests Required | # Tests Performed | # Inadequate LRV |
|-----------|---------|-------------|------------------|-------------------|------------------|
| LRV | LRV ≥ 3 | 4.07 - 5.94 | 1131 | 1131 | 0 |

In order to receive the log removal credits for both Giardia and Cryptosporidium, a removal efficiency equal to or greater than 3 has to be maintained through daily pressure decay testing on each UF bank in production.

TURBIDITY

Turbidity for Water Leaving the UF System

| Parameter | Limit (NTU) | Range (NTU) | 99 th Percentile (NTU) | # Tests Required | # Tests Performed | # months Exceeding Limit |
|-----------|--|-------------|-----------------------------------|------------------|-------------------|--------------------------|
| Turbidity | < 0.10 – 99% of time each month and; not to be > 0.1 for > 15 minutes and; never > 0.3 | 0.04 – 0.10 | 0.09 | Continuous | Continuous | 0 |

Turbidity for Water Entering the Distribution System

| Parameter | Limit (NTU) | Range (NTU) | # Tests Required | # Tests Performed |
|-----------|-------------|-------------|------------------|-------------------|
| Turbidity | No standard | 0.05 – 0.10 | Continuous | Continuous |

Turbidity values are monitored continuously with an on-line analyzer and tests normally performed on a daily basis by waterworks operators and are recorded in operation records.

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 | 0.05 – 0.09 | 104 | 104 | 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.

FLUORIDE

Fluoride – From Treated Water at the Water Treatment Plant (on-site testing)

| Parameter | Limit (mg/L) | Average (mg/L) | Maximum (mg/L) | # Samples Required | # Samples Submitted | # Exceeding Limit |
|-----------|--------------|----------------|----------------|--------------------|---------------------|-------------------|
| Fluoride | 1.5 | 0.67 | 0.98 | 365 | 361 | 0 |

A testing equipment break down resulted in no results for Feb. 24 to Feb. 27. The EPO was notified of the missed testing. All of the tested fluoride results were under the regulatory limit 100% of the time.

Fluoride – From Test Results Submitted with Bacteriological Samples (off-site testing)

| Parameter | Limit (mg/L) | Average (mg/L) | Maximum (mg/L) | # Samples Required | # Samples Submitted | # Exceeding Limit |
|-----------|--------------|----------------|----------------|--------------------|---------------------|-------------------|
| Fluoride | 1.5 | 0.41 | 0.52 | 52 | 52 | 0 |

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CHEMICAL – 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 | 0.069 | 4 | 4 |

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.

| Parameter | Limit (mg/L) | Average (mg/L) | # Samples Required | # Samples Submitted |
|------------------|--------------|----------------|--------------------|---------------------|
| Haloacetic Acids | 0.080 | 0.046 | 4 | 4 |

CHEMICAL – HEALTH

The LLRRWC is required to submit water samples for the WSA's Chemical Health category once every year.

| Parameter | MAC (mg/L) | IMAC (mg/L) | AO* (mg/L) | Sample Results (mg/L) | # of Samples Required | # of Samples Submitted |
|-----------|--------------|-------------|------------|-----------------------|-----------------------|------------------------|
| Aluminum | No Objective | | | 0.0012 | 1 | 1 |
| Antimony | 0.006 | | | <0.0002 | 1 | 1 |
| Arsenic | 0.010 | | | 0.0004 | 1 | 1 |
| Barium | 1.0 | | | 0.033 | 1 | 1 |
| Boron | | 5.0 | | 0.01 | 1 | 1 |
| Cadmium | 0.005 | | | <0.00001 | 1 | 1 |
| Chromium | 0.05 | | | <0.0005 | 1 | 1 |
| Copper | | | 1.0 | 0.19 | 1 | 1 |
| Iron | | | 0.3 | 0.0180 | 1 | 1 |
| Lead | 0.01 | | | 0.0002 | 1 | 1 |
| Manganese | | | 0.05 | 0.0190 | 1 | 1 |
| Selenium | 0.01 | | | <0.0001 | 1 | 1 |
| Silver | No Objective | | | <0.00005 | 1 | 1 |
| Uranium | 0.02 | | | <0.0001 | 1 | 1 |
| Zinc | | | 5 | 0.012 | 1 | 1 |

MAC – Maximum Acceptable Concentrations

AO – Aesthetic Objective

IMAC – Interim Maximum Acceptable Concentrations

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CHEMICAL – GENERAL

The LLRRWC is required to submit water samples for the WSA's General Chemical category once per three months every year.

| Parameter | MAC | AO * | Sample Results | # Of Samples Required | # Of Samples Submitted |
|-------------------------------|--------------|-----------|----------------|-----------------------|------------------------|
| Total Alkalinity (mg/L) | | 500 | 118 | 4 | 4 |
| Bicarbonate (mg/L) | No Objective | | 144 | 4 | 4 |
| Calcium (mg/L) | No Objective | | 31 | 4 | 4 |
| Carbonate (mg/L) | No Objective | | <1 | 4 | 4 |
| Chloride (mg/L) | | 250 | 7.1 | 4 | 4 |
| Fluoride (mg/L) | 1.5 | | 0.48 | 4 | 4 |
| Total Hardness (mg/L) | | 800 | 118 | 4 | 4 |
| Hydroxide (mg/L) | No Objective | | <1 | 4 | 4 |
| Magnesium (mg/L) | | 200 | 9.9 | 4 | 4 |
| Nitrate (mg/L) | 45 | | 0.29 | 4 | 4 |
| pH (pH units) | | 6.5 - 9.0 | 7.93 | 4 | 4 |
| Potassium (mg/L) | No Objective | | 1.8 | 4 | 4 |
| Sodium (mg/L) | | 300 | 4.1 | 4 | 4 |
| Specific Conductivity (µs/cm) | No Objective | | 241 | 4 | 4 |
| Sulphate (mg/L) | | 500 | 1.6 | 4 | 4 |
| Sum of Ions | No Objective | | 200 | 4 | 4 |
| Total Dissolved Solids (mg/L) | | 1500 | 150 | 4 | 4 |

MAC – Maximum Acceptable Concentration

AO – Aesthetic Objective

*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.

CHEMICAL – PESTICIDES

The LLRRWC is required to submit water samples for the WSA's Pesticide category once every second year. 2019 is not a required sampling year. The 2018 results are included 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

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CHEMICAL – ORGANICS

The LLRRWC 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 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

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. The LLRRWC is required to sample for cyanide and mercury once every year.

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

MICROCYSTIN LR and/or TOTAL MICROCYSTIN TOXINS

The LLRRWC 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 |

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GIARDIA AND CRYPTOSPORIDIUM (Raw Water)

The LLRRWC is required to sample for giardia & cryptosporidium semi-annually (early spring and fall) and following upsets or significant events that may affect raw water quality from the raw water entering the water treatment plant.

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

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

Lac La Ronge Regional Water Corporation
Box 100
Air Ronge SK S0J 3G0
Phone: 306-420-7749; Email: llrrwc@gmail.com