Policy Type:	Utilities
Policy Title:	Quality Assurance/Quality Control Policy
Policy Number:	800-04

Authority:	
Council Resolution #	~~*167/21*~~ *25/24*

1. Policy Statement

The Village of Loon Lake as the owner / operator of the drinking water system servicing the Village of Loon Lake residents understand that supplying good quality drinking water is essential to the continued growth, prosperity, and well being of our citizens. We are committed to managing all aspects of our water system effectively to provide safe and aesthetically appealing water that tastes good and is free from objectionable colour or odour. It is our policy that the drinking water we provide will be produced in accordance with and meet or exceeds the quality standards required by *The Waterworks and Sewage Works Regulations*.

To achieve our goals, we will:

- Cooperate with the provincial government to protect our waterworks and water sources from contamination.
- Ensure the potential risks associated with water quality are identified and assessed.
- Ensure that our water supply, treatment, storage, and distribution infrastructure is properly designed, constantly maintained, and regularly evaluated and improved.
- Include the drinking water quality and quantity priorities, needs, and expectations of our citizens, the provincial authorities, and our water system employees into our planning.
- Develop a mechanism to ensure adequate funds are available for the water utility to maintain and improve the infrastructure, implement best practices, and ensure our water treatment employees are educated about their responsibilities and adequately trained and certified.
- Establish regular verification of the quality of drinking water provided to our citizens and monitoring of the water treatment process that produce the water.
- Provide community awareness about the water supply and its management by establishing and maintaining effective reporting of the water quality and timely information about the water system to our citizens.
- Develop contingency plans and incident response capabilities in cooperation with provincial authorities.
- Where possible participate in activities to ensure continued understanding or drinking water quality issues and performance.
- Regularly assess our performance and continually improve our practices to produce good quality water.

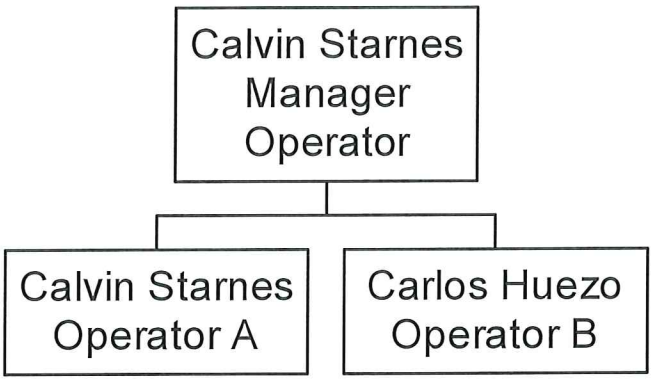
We will develop a Drinking Water Quality Management System including an implementation plan to achieve these goals and adequately manage the risks to our drinking water quality.

All of our officials, managers, and employees involved with the supply of drinking water are responsible for understanding, implementing, maintaining, and continuously improving the Drinking Water Quality Management System.

2. Organizational Structure

In this section, an organizational chart for the waterworks and associated administration should be inserted. The roles and responsibilities of each person identified in the organization structure chart should also be provided. In addition, contact information for members listed below should be included. The operations manager shall be responsible for reporting to the elected structure on the operation and condition of the works and on monthly review of records as required by section 43(2) of *The Waterworks and Sewage Works Regulations*.

Organization Chart



Waterworks Operations, Management and Administration

Mayor
Brian Hirschfeld Brian3hab@sasktel.net 639-836-7605
Deputy Mayor
Jon Kemp jon.kemp@mltc.ca 306-819-5944
Municipal Administrator
Erin Simpson loonlake@sasktel.net 780-870-4610
Waterworks Manager -
Calvin Starnes loonlake@sasktel.net 306-819-5944
Water Treatment Operator
Carlos Huezo 780-399-2005
Water Treatment Operator (no longer has a contract with the Village but may be available to assist if needed)
Trent Langton 780-385-0671
Water Distribution System Operator
Calvin Starnes loonlake@sasktel.net 306-819-5944
Wastewater Works Operator
Calvin Starnes loonlake@sasktel.net 306-819-5944
Wastewater Collection System Operator
Calvin Starnes loonlake@sasktel.net 306-819-5944

The following is a summary of the role and responsibility of various persons involved in production and management of drinking water for the Village of Loon Lake.

The role of the Mayor with respect to waterworks operation includes:

- ❑ Overall responsibility for waterworks, quality of water provided to consumers, and regulatory compliance in capacity of person responsible for the municipality or waterworks
- ❑ In conjunction with council, allocates financial resources through a budgeting process and establishes water and sewer rates and or surcharges
- ❑ Chief official in the event of a emergency situation

The role of the Municipal Administrator includes:

- ❑ Receives and prepares administrative, budget and waterworks record submissions for review of assigned Council member and to be tabled/considered at a Council meeting
- ❑ Arranges for and provides annual notification to consumers served by the waterworks on the quality of drinking water provided and on sample submission compliance. Prepares a report to Council on the state of drinking water on an annual basis
- ❑ Receives and resolves or forwards all correspondence dealing with drinking water operations from on behalf or mayor/reeve and council
- ❑ Prepares financial reports regarding waterworks operational and maintenance issues
- ❑ Prepares strategies for ensuring waterworks sustainability
- ❑ Invoicing and receipt of waterworks related expenses as well as consumer charges for water use

The role of the Waterworks Manager includes:

- ❑ Overall responsibility for the day to day operation of the waterworks
- ❑ Develops operational and maintenance protocols and plans
- ❑ Develops safety plans and conducts safety inspections
- ❑ Budget for operation and maintenance of waterworks
- ❑ Develops Waterworks Emergency Response Plan
- ❑ Provides guidance to operators on operation of works
- ❑ Staffing of waterworks operators and issues of supervision and scheduling

The role of the Water Treatment Operator(s) includes:

- ❑ Start up, shut down and periodic operating checks of plant equipment such as pumping systems, chemical feeders, auxiliary equipment (compressors), and measuring and control systems
- ❑ Makes arithmetic calculations to determine chemical feed rates, flow quantities, detention and contact times, and hydraulic loadings as required by plant operations
- ❑ Monitors the status of plant operating guidelines, such as flow pressures, chemical feeds, levels and water quality indicators, by reference to measuring systems
- ❑ Performs routine preventative maintenance, such as lubrication, operating adjustments, cleaning and painting equipment;
- ❑ Maintain plant records, including operating logs, daily diaries, chemical inventories and automated data logs
- ❑ Collects representative water samples and performs laboratory tests on samples for turbidity, chlorine residual and other tests as required by the operating permit or operational protocol
- ❑ Perform minor corrective maintenance on plant mechanical equipment, e.g.: chemical feed pumps
- ❑ Conducts tours of the waterworks and communicates with the public on issues associated with water quality
- ❑ Orders chemicals, repair parts and tools
- ❑ Load, unload and store water treatment chemicals
- ❑ Follows safety rules for plant operations

The role of the Water Distribution System Operator includes

- Periodic flushing or swabbing of the distribution system
- Locate and repair water leaks and operates, maintains and repairs valves and hydrants
- Collects and transports routine water samples from the distribution system and ensures proper packaging and shipment to the laboratory
- Performs repair work while ensuring safety procedures for the works site, traffic and the public are maintained
- Disinfects repaired or new sections of pipe and collects the necessary water samples
- Maintains distribution system plans and maps
- Cleans, disinfects and maintains reservoirs or other storage systems
- Operates and maintains any pumping equipment or facilities remote from the main water treatment plant as necessary
- Locates and eliminates cross-connections or potential cross-connections

3. Operations and Maintenance Protocol

Operation of the community waterworks will be performed in accordance with design specifications and standard operating protocols of the waterworks industry. Further detail regarding standards operating procedures, range of operation and chemical feed, maintenance practices and intervals are outlined below.

Waterworks Operation/Maintenance Protocol

System Design Capacity (m^3/day or L/s):	**190.75 m3/day 190,789 litres/day**
Intake – type	Well # 3 7.5 hp 80 gallon/minute Goulds pump
	Well # 4 10 HP 230V 3 phase 6" motor
	Grundfoss 4" pump 85 Gal/minute
Status of bar screens:	Clean Screen
Pump check/inspection:	As required (Frequency)
Depth of intake winter & summer	Monthly draw down

Well(s)

Number of wells:	2
Pump maintenance/change-out:	As required (Frequency)

Wellhead protection inspection:Monthly (Frequency)

Filtration – Method/Type(s)	Arsenic Filter
Capacity:	
Filtration Rate:	40 US Gallons per minute
Media type(s):	Arsenic Filter – Activated alumina
Backwash type (man/auto):	RO Automatic Arsenic Filter Manual
Backwash frequency:	Arsenic Filter every 2 months
Air assisted backwash (Yes/No) No	
Media evaluation:	As required (Frequency)
Media Replacement:	As required (Frequency)
Filter to waste (Yes/No/duration):	10 minute backwash, 5 minute rinse Arsenic
Filter Inspection:	As required.
Other Treatment Method(s)/Type:	Reverse Osmosis
Maintenance Type:	As required
Maintenance Schedule:	Filter replaced as needed. October 2012
Process Waste Management	3 gallons treated to 1 gallon backwash
Inspection:	Daily (Frequency)
Disinfection - Method/Type(s):	Chlorine
Disinfectant used:	Chlorine
Dosage rate/range:	700-800 ml/hour
Feed type:	Grundfoss Injection Pump
Residual monitoring (location):	Daily WTP (Frequency)
Water Storage - Type/size:	Reinforced Concrete
Volume of treated storage:	390 m3
Fire water capacity:	390 m3
Output metering (Yes/No)	Yes
Output meter recording:	Recorded Daily
Maintenance:	As required
Inspection & cleaning:	Monthly visual inspection

Water Distribution System

Piping type(s):	6 inch AC (asbestos cement mains)
	Copper/plastic service lines
Flushing schedule:	Annually
Foam Swabbing schedule:	As required
Pumps:	2 – Marathon Electric 5 HP 3 phase
Pumping capacity:	160 GPM
Emergency pumping capacity:	160 GPM
Backflow prevention: (Yes/No)	NO
Hydrant maintenance schedule: Annually	
Valve maintenance schedule:	Annually
Repair safety procedures (Yes/No)	Yes
Line/Main break disinfection (Yes/No)	Yes
Line/Main break sampling (Yes/No)	Yes
Customer metering (Yes/No)	Yes
Truck fill station (Yes/No)	Yes
Truck fill backflow (Yes/No)	Yes
Water hauler protocols:	No herbicide/pesticide containers allowed new truck fill

4. Water Quality Monitoring, Data Collection, Record Keeping, Record Review and Reporting Procedures

The following monitoring and record keeping protocols apply to the operation of the waterworks and distribution system

Water Quality Monitoring - Permit and Regulatory Requirements

The Village of Loon Lake will conduct all monitoring required by permit or ministers order issued by the Water Security Agency. The Environmental Project Officer (EPO) Morgan Gutek responsible for regulation of the waterworks will be advised of any positive bacteriological sample result as well as any exceedance of other water quality standards as determined through sampling and analysis for other substances as required by permit or ministers order. As of March 31, 2004, all required drinking water quality monitoring samples, other than samples for chlorine residual, turbidity or pH will be sent to and analyzed by an accredited laboratory. Appendix A which contains a Treated Water Quality Monitoring Plan can be used to record the communities monitoring activities and results.

The community of Village of Loon Lake will conduct daily free chlorine residual monitoring of drinking water entering the distribution system and turbidity monitoring at each filter as required by regulation, permit or ministers order issued by WSA. The EPO, Morgan Gutek responsible for regulation of the waterworks will be advised of any failure to meet a free-chlorine residual of at least 0.1 mg/L for water entering the distribution system as well as any exceedance of turbidity levels as required by operational permit, ministers order or regulatory requirement. Additionally, the community of Village of Loon Lake will advise the EPO Morgan Gutek responsible for regulation of the waterworks of any failure of the disinfection system or any other upset

to the water treatment process, operation or distribution system concern in accordance with good practice or the emergency response plan – technical action plans for the waterworks.

Operational Monitoring Plan

Observational and measurement related operational monitoring of water quality and associated reporting requirements are established for the community of Village of Loon Lake waterworks. Water works operators will monitor operational process in accordance with Table 1.

Table 1. Operational parameters – Examples

Operational Parameter	Raw water	Filtration	Disinfection	Distribution system
pH	☑		☑	☑
Turbidity (or particle count)	☑	X	☑	☑
Temperature				
Dissolved Oxygen				
River/stream flow				
Total coliforms				X
Background bacteria				X
Colour				
Conductivity	☑			
Alkalinity	☑			
Organic carbon	☑		☑	
Algae and algal toxins				
Chemical dosage			☑	
Flow rate		☑	☑	
Headloss				
CT				
Disinfectant residual			X	X
Disinfection By Products				X
Pressure				☑

Key: Items with a check mark are recommended **Items with an "X" are mandatory**

Record Keeping

Waterworks records and logs will be kept in accordance with the requirements of *The Waterworks and Sewage Works Regulations*. The following persons are delegated responsibility for operational record and log keeping: Calvin Starnes appointed by Mayor and Council to keep waterworks records and logs). Operational records and logs will include:

- total water pumped into the distribution system on a daily basis or the total raw water used;
- the types, dosages and total amounts of chemicals applied to the water for treatment;
- locations from which samples for any tests conducted by the permittee of the waterworks were taken in accordance with the permittee's permit and the name of the person who conducted the sampling or testing and the results of those tests;
- any departures from normal operating procedures that may have occurred and the time and date that they occurred;
- any instructions that were given during operation of the waterworks to depart from normal operating practices and the name of the person who gave the instructions;
- any upset condition or bypass condition, the time and date of the upset condition or bypass condition and measures taken to notify others and resolve the upset condition or bypass condition;
- any condition of low disinfectant levels, the time, date and location of occurrence and measures taken to restore disinfectant levels to required values;
- the dates and results of calibrating any metering equipment and testing instruments; and
- the dates and types of maintenance performed on equipment and any actions taken to ensure the normal operations of the waterworks.

The operational records or logs mentioned above will be recorded and maintained in the following manner:

- operational records or logs must be made in chronological order, with the dates, times and testing locations clearly indicated;
- entries in an operational record or log will only be made by the permittee or person specifically appointed by the permittee;
- persons making an entry in an operational record or log shall do so in a manner that allows the person to be unambiguously identified as the maker of the entry;
- operational records or logs must be maintained for at least five years;
- any anomalies or instances of missing entries in an operational record or log must be accompanied by explanatory notes;
- operational records or logs must only contain data or information that is actually observed or produced;
- operational records or logs must not contain default values generated manually or by automated means;
- operational records or logs maintained in accordance with the above requirements must be made available promptly on request of the Minister of Environment or a representative of the Minister.

Record Review and Reporting

The waterworks manager shall present to council monitoring results, records and operational logs on a monthly basis. If the review of the records or logs indicates that the quality of water from the waterworks has been adversely affected, the findings will be reported to the Water Security Agency as soon as reasonably practical after the report has been completed.

5. Emergency Response Planning

The Village of Loon Lake Waterworks Emergency Response Planning was adopted by the Village of Loon Lake council on September 1, 2021.

6. Effective Date/Repeal

This policy will come into effect on September 27, 2021 unless otherwise specified and shall be implemented as outlined in this policy. This policy repeals and replaces all resolutions and any policies pertaining to council remuneration that have been consolidated into this policy and replaces all past practices. This policy may only be amended or repealed by resolution of Council.

APPENDIX A

00002315 05 00
Loon Lake Waterworks, Hwy 26, Loon Lake, Permit To Operate Renewal

▶ The parameters below are most applicable to drinking water quality and the most recent measurement received is displayed. Follow-up sampling is required for all positive bacteriological samples. Where possible, limits are shown beside the measurement. (Limits marked with an asterisk (*) are in Saskatchewan Drinking Water Quality Standards and Objectives)

▶ If the value exceeds the limit, Saskatchewan Environment is in contact with the waterworks operator and will advise them on proper actions to take to ensure safe drinking water.

CURRENT SAMPLING REQUIREMENTS

Location	Parameter	Sample Frequency	Value	Minimum Allowable Limit	Maximum Allowable Limit
Random Location-Loon Lake Distribution System	Distributed Water Alkalinity Total Caco3	Every Two Years (Effective: February 08, 2005)	67.6 MG/L	Not Applicable*	500 MG/L*
Random Location-Loon Lake Distribution System	Distributed Water Aluminum Total	Every Two Years (Effective: February 08, 2004)	10.4 UG/L	Not Applicable*	.1 MG/L*
Random Location-Loon Lake Distribution System	Distributed Water Arsenic Total	Every Two Years (Effective: February 08, 2004)	5.6 UG/L	Not Applicable*	10 UG/L*
Random Location-Loon Lake Distribution System	Distributed Water Barium Total	Every Two Years (Effective: February 08, 2004)	1 UG/L	Not Applicable*	1 MG/L*

Random Location-Loon Lake Distribution System	Distributed Water Bicarbonate (Calcd.)	Every Two Years (Effective: February 08, 2005)	82 MG/L	Not Applicable*	No Limit Established*
Random Location-Loon Lake Distribution System	Distributed Water Boron Total	Every Two Years (Effective: February 08, 2004)	.2 MG/L	Not Applicable*	5 MG/L*
Random Location-Loon Lake Distribution System	Distributed Water Cadmium Total	Every Two Years (Effective: February 08, 2004)	< .15 UG/L	Not Applicable*	.005 MG/L*
Random Location-Loon Lake Distribution System	Distributed Water Calcium Dissolved	Every Two Years (Effective: February 08, 2005)	2 MG/L	Not Applicable*	No Limit Established*
Random Location-Loon Lake Distribution System	Distributed Water Carbonate (Calcd.)	Every Two Years (Effective: February 08, 2005)	0 MG/L	Not Applicable*	No Limit Established*
Random Location-Loon Lake Distribution System	Distributed Water Chloride Dissolved	Every Two Years (Effective: February 08, 2005)	4.4 MG/L	Not Applicable*	250 MG/L*
Random Location-Loon Lake Distribution System	Distributed Water Chlorine Free - Client	Monthly (Effective: February 09, 2005)	.97 MG/L	.1 MG/L*	No Limit Established*
Random Location-Loon Lake Distribution System	Distributed Water Chlorine Free - Client	Followup Sampling (Effective: February 08, 2005)	1.43 MG/L	Not Applicable*	No Limit Established*
Random Location-Loon Lake Distribution System	Distributed Water Chlorine Total - Client	Monthly (Effective: February 09, 2005)	1.22 MG/L	.5 MG/L*	No Limit Established*
Random Location-Loon Lake Distribution System	Distributed Water Chlorine Total - Client	Followup Sampling (Effective: February 08, 2005)	1.5 MG/L	Not Applicable*	No Limit Established*
Random Location-Loon Lake Distribution System	Distributed Water Chromium Total	Every Two Years (Effective: February 08, 2004)	< .19 UG/L	Not Applicable*	.05 MG/L*
Random Location-Loon Lake Distribution System	Distributed Water Coliforms Total	Monthly (Effective: February 09, 2005)	0 NO/100ML	Not Applicable*	0 NO/100ML*

Random Location-Loon Lake Distribution System	Distributed Water Coliforms Total	Followup Sampling (Effective: February 08, 2005)	0 NO/100ML	Not Applicable*	0 NO/100ML*
Random Location-Loon Lake Distribution System	Distributed Water Copper Total	Every Two Years (Effective: February 08, 2004)	< 8.29 UG/L	Not Applicable*	1 MG/L*
Random Location-Loon Lake Distribution System	Distributed Water Escherichia, Coli	As Required (Effective: February 08, 2005)	0 NO/100ML	Not Applicable*	0 ABSEN/PRES*
Random Location-Loon Lake Distribution System	Distributed Water Escherichia, Coli	Followup Sampling (Effective: February 08, 2005)	0 NO/100ML	Not Applicable*	0 ABSEN/PRES*
Random Location-Loon Lake Distribution System	Distributed Water Fluoride Dissolved	Every Two Years (Effective: February 08, 2005)	< .05 MG/L	Not Applicable*	1.5 MG/L*
Random Location-Loon Lake Distribution System	Distributed Water Hardness Total (Calcd.) Caco3	Every Two Years (Effective: February 08, 2005)	9 MG/L	Not Applicable*	800 MG/L*
Random Location-Loon Lake Distribution System	Distributed Water Iron Total	Every Two Years (Effective: February 08, 2004)	.052 MG/L	Not Applicable*	.3 MG/L*
Random Location-Loon Lake Distribution System	Distributed Water Lead Total	Every Two Years (Effective: February 08, 2004)	.1 UG/L	Not Applicable*	.01 MG/L*
Random Location-Loon Lake Distribution System	Distributed Water Magnesium Dissolved	Every Two Years (Effective: February 08, 2005)	< 1 MG/L	Not Applicable*	200 MG/L*
Random Location-Loon Lake Distribution System	Distributed Water Manganese Total	Every Two Years (Effective: February 08, 2004)	.0063 MG/L	Not Applicable*	.05 MG/L*
Random Location-Loon Lake Distribution System	Distributed Water Ph	Every Two Years (Effective: February 08, 2005)	6.8 PH UNITS	6.5 PH UNITS*	9 PH UNITS*

Random Location-Loon Lake Distribution System	Distributed Water Selenium Total	Every Two Years (Effective: February 08, 2004)	< 1.13 UG/L	Not Applicable*	.01 MG/L*
Random Location-Loon Lake Distribution System	Distributed Water Sodium Dissolved	Every Two Years (Effective: February 08, 2005)	30 MG/L	Not Applicable*	300 MG/L*
Random Location-Loon Lake Distribution System	Distributed Water Specific Conductance	Every Two Years (Effective: February 08, 2005)	139 USIE/CM	Not Applicable*	No Limit Established*
Random Location-Loon Lake Distribution System	Distributed Water Total Dissolved Solids (Calcd.)	Every Two Years (Effective: February 08, 2005)	123 MG/L	Not Applicable*	1500 MG/L*
Random Location-Loon Lake Distribution System	Distributed Water Turbidity - Client	Monthly (Effective: February 09, 2005)	.12 NTU	Not Applicable*	No Limit Established*
Random Location-Loon Lake Distribution System	Distributed Water Turbidity - Client	Followup Sampling (Effective: February 08, 2005)	.11 NTU	Not Applicable*	No Limit Established*
Random Location-Loon Lake Distribution System	Distributed Water Uranium Total	Every Two Years (Effective: February 08, 2004)	< .11 UG/L	Not Applicable*	20 UG/L*
Random Location-Loon Lake Distribution System	Distributed Water Zinc Total	Every Two Years (Effective: February 08, 2004)	< 4 UG/L	Not Applicable*	5 MG/L*