Town of Eatonia Statement of Policy and Procedure			
Subject:	Waterworks Quality Assurance/Quality Control Policy	Policy No:	14
Date of Council Approval:	April 13, 2021	Resolution No.	17/4/21

1. Policy Statement

We, the Town of Eatonia, 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

Waterworks Operations, Management and Administration

Mayor:

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Municipal Administrator:

Cheryl Bailey
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Water Treatment Operators:

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

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 Council Members assigned responsibility for the Waterworks includes:

- Oversees and reports on operational, maintenance or infrastructure issues or needs to Council and the Mayor to ensure issues are addressed
- In conjunction with the Waterworks manager reviews operational records and logs on a monthly basis in accordance with the requirements of section 43(2) of *The Waterworks and Sewage Works Regulations.*

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 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 Water Treatment Operator(s) includes:

- Overall responsibility for the date to day operation of the waterworks
- Develops operational and maintenance protocols and plans
- Provides guidance to operators on operation of works
- 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
- 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

Further information or information regarding the role of water treatment, water distribution, wastewater treatment and wastewater collection system operators, is available from "Water and Wastewater Operator Certification Program Guide, 2015, June 2015, EPB-144".

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): 180 gals/min

Well(s)

Number of wells:	3	
Pump maintenance/change-out:	only if problems	(Frequency)
Well/pump service disinfection:	no	
Wellhead protection inspection:	yes – monthly	(Frequency)

Pretreatment – Method

Potassium Permanganate:	Regenerate annually
Pre-chlorination:	Dosage rate/range 3 lbs/day
Aeration:	Rate/range n/a
Other:	Dosage rate/range/method n/a

Coagulation & Flocculation:

Aluminum Sulfate:	Dosage rate/range 0.25/10 gallons	
Ferric Chloride:	Dosage rate/range n/a	
Polymer (type):	Dosage rate/range n/a	
Other:	Dosage rate/range n/a	
Lime:	Dosage rate/range n/a	
Soda Ash:	Dosage rate/range n/a	
Mixing method:	n/a	
Mixer inspection:	n/a	(Frequency)
Detention Time:	n/a	
Jar testing:	weekly	(Frequency)

Sedimentation – Method	Retention Pit	
Turbidity measurement:	Daily	(Frequency)
Temperature measurement:	n/a	(Frequency)
Visual floc settling/distribution:	n/a	(Frequency)
Sludge removal – method/frequency:	Every 4 months – manual	
Sludge disposal method:	To waste	
Equipment Inspection:	Daily	(Frequency)

Filtration – Method/Type(s)	Green Sand
Capacity:	180 gals/minute
Filtration Rate:	35,000 gallons daily
Media type(s):	Anthracite and Green Sand

Headloss measurement:	n/a	(Frequency)
Backwash type (man/auto):	Manual	
Backwash frequency:	Every 300,000 gallons	
Backwash rate:	350 gallons/minute	
Air assisted backwash (Yes/No)	Yes	
Media evaluation:	Yearly	(Frequency)
Media Replacement:	As needed	(Frequency)
Filter to waste (Yes/No/duration):	Yes	
Filter Inspection:	Yearly	(Frequency)

Iron/Manganese Control – Method/Type:	yes – chlorine and potassium permanganate
Filtration Rate:	180 gal/min
Potassium Permanganate:	Dosage rate/range θ
Pre-chlorination:	Dosage rate/range 5%
Aeration:	Rate/range none
Other:	Dosage rate/range/method none

Disinfection - Method/Type(s):	Yes	
Disinfectant used:	Chlorine	
Dosage rate/range:	1%	
Feed type:	Gas	
Residual monitoring (location):	Reservoir (daily)	(Frequency)

Water Storage - Type/size:	Reservoir – 150,000 gallons	
Volume of treated storage:	150,000 gallons	
Fire water capacity:	150,000 gallons	
Output metering (Yes/No)	Yes	
Output meter recording:	Daily	(Frequency)
Maintenance:	Daily	(Frequency)
Inspection & cleaning:	Weekly	(Frequency)

Water Distribution System		
Piping type(s):	Plastic and cast	
Flushing schedule:	Annual	
Foam Swabbing schedule:	None	
Pumping capacity:	200 gal/min (distribution)	(L/s)
Emergency pumping capacity:	800 gal/min	(L/s)
Backflow prevention: (Yes/No)	Yes	
Hydrant maintenance schedule:	Annual	
Valve maintenance schedule:	Annual	
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:	Yes	

Corrosion Control – Method:	Injection
Chemical(s) used:	None
Cathodic protection (Yes/No)	Yes

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 community of Eatonia will conduct all monitoring required by permit or ministers order issued by the Water Security Agency. The Environmental Project Officer (EPO), Scott Klippenstein, _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 Eatonia 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, Scott Klippenstein, 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 Eatonia will advise the EPO, Scott Klippenstein, 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 Eatonia waterworks. Water works operators will monitor operational process in accordance with Table 1.

Table 1. Operational parameters –

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

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: _Rob Assmus and Jerry Fuerstenberg. 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 town council and the water treatment operator(s) will review all 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 purpose of an Emergency Plan is to provide a detailed guide for dealing with an unexpected event that may have an impact on the:

- Delivery of a continuous supply of safe, clean, uncontaminated water to consumers.
- Protection of life – efficient and effective notification and communications of unsafe conditions.
- Protection of property – fire protection, impacts of flooding.
- Protection of the environment – erosion, hazardous materials contamination of soil and air.

The Town of Eatonia has developed a Waterworks Emergency Plan, Policy No. 15.