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Author: Andrew Polley, QMS Representative			

EGANVILLE DRINKING WATER SYSTEM

QUALITY MANAGEMENT SYSTEM (QMS)

OPERATIONAL PLAN



TOWNSHIP OF BONNECHERE VALLEY
WATER & SEWAGE DEPARTMENT
401 WATER STREET
EGANVILLE, ONTARIO
K0J 1T0

1. Document History

Document Location

The master electronic version of this document is on the main server located at the Township of Bonnechere Valley Municipal Office and is accessible from any workstation. The master printed copy is kept in a binder on the bookshelf in the Operations Room of the Eganville Water Treatment Plant, 401 Water St., Eganville. Printed copies should always be checked for the current revision number and date. Refer to the author if you are in any doubt about the accuracy of this document.

Revision History

Revision Number	Revision Date	Summary of Changes	Author
0	Dec. 15, 2009	Creation of original document	Andrew Polley
1	May 24, 2010	Section 16 & 17 modifications	Andrew Polley
2	January 27, 2011	Section 11, 17, 18, & 19 modifications	Andrew Polley
3	March 21, 2011	Section 9, 11, 16, 17 & 19 modifications	Andrew Polley
4	January 16, 2012	Title Page & Header modifications, Section 17 & 19 updates	Andrew Polley
5	August 20, 2012	Annual review and updates	Andrew Polley
6	April 4, 2013	Section 9, 16 & 17 updates	Andrew Polley
7	May 8, 2013	Section 8 & 19 updates	Andrew Polley
8	June 3, 2014	Annual review and updates	Andrew Polley
9	June 23, 2014	Additional updates Sec. 15 & 16	Andrew Polley
10	April 28, 2015	Annual review and updates	Andrew Polley
11	June 23, 2015	Additional updates Sec. 17 & 19	Andrew Polley
12	July 28, 2015	Additional updates Sec. 6 & 7	Andrew Polley
13	August 4, 2016	Annual review and updates	Andrew Polley
14	May 15, 2017	Annual review and updates as required	Andrew Polley
15	April 20, 2018	Annual review and updates as required	Andrew Polley
16	June 18, 2019	Annual review and update to DWQMS 2.0	Andrew Polley
17	July 10, 2019	Commitment and Endorsement of Council	Andrew Polley
18	January 18, 2021	Annual review and updates as required	Andrew Polley
19	April 21, 2021	Commitment and Endorsement Update	Andrew Polley

Approvals

This document and any subsequent revisions require the following approvals:

Name	Title	Signature	Date
Andrew Polley	QMS Representative	<i>A. Polley</i>	April 21, 2021

Distribution

This document has been electronically distributed to:

Name	Title
Daryl Verch	Manager, Water & Sewage Department
Annette Gilchrist	CAO, Township of Bonnechere Valley

Availability

The Eganville Drinking Water System QMS Operational Plan is available on the Township of Bonnechere web site at <http://www.bonnecherevalleytwp.com/departments/water-sewage/>

The Operational Plan, Figures, Procedures and Appendices are available by request at the Municipal Office, 49 Bonnechere Street East, Eganville, ON K0J 1T0.

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04.00 Critical Control Points, Limits & Response

Appendix 04.01 Critical Limit Response Instructions

05.00 Communications

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07.00 Water Quality Sampling, Monitoring & Analysis

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6. Quality Management System (DWQMS Element #1)

The Operational Plan documents a Quality Management System (QMS) that has been developed to meet the requirements of the Drinking Water Quality Management Standard (DWQMS) as approved under Section 21 of the Safe Drinking Water Act (SDWA).

7. Quality Management System Policy (DWQMS Element #2)

**THE CORPORATION OF THE TOWNSHIP OF BONNECHERE VALLEY
EGANVILLE DRINKING WATER SYSTEM
QUALITY MANAGEMENT SYSTEM POLICY**

The Corporation of the Township of Bonnechere Valley owns, operates and maintains the Eganville Drinking Water System and is committed to:

- **Providing a ‘Standard of Care’ that is consistent with the Safe Drinking Water Act;**
- **Ensuring the provision of a safe and reliable municipal drinking water supply;**
- **Maintaining and continually improving the Quality Management System; and**
- **At a minimum, to meet all relevant legislation and regulatory requirements.**

**The Corporation of the Township of Bonnechere Valley
By Resolution dated April 6, 2021**

8. Commitment and Endorsement (DWQMS Element #3)

The Quality Management System Operational Plan is endorsed by the Owner (represented by the Mayor) and Top Management (represented by the Chief Administrative Officer and the Water and Sewage Department Manager).

The Owner and Top Management commit to:

- Ensuring that a Quality Management System is in place that meets the requirements of the Drinking Water Quality Management Standard (DWQMS);
- Ensuring that they are aware of all applicable legislative and regulatory requirements;
- Communicating the Quality Management System according to the Communications Procedure;
- Determining, obtaining or providing the resources needed to maintain and continually improve the Quality Management System.

Date

Jennifer Murphy, Mayor

Date

Annette Gilchrist, CAO

Date

Daryl Verch, Manager

Note: The Resolution of Council dated April 6, 2021 and the original signed and dated “Commitment and Endorsement” document is in the QMS Operational Plan binder. A pdf copy is in file 830.20.10

9. QMS Representation (DWQMS Element #4)

The Quality Management System Representative, appointed by Top Management and irrespective of other responsibilities, shall:

- Administer the Quality Management System by ensuring that processes and procedures needed for the Quality Management System are established and maintained;
- Ensure that current versions of documents required by the Quality Management System are being used at all times;
- Ensure that personnel are aware of all applicable legislative and regulatory requirements that pertain to their duties for the Eganville Drinking Water System;
- Promote awareness of the Quality Management System throughout the Water & Sewage Department;
- Report to Top Management on the performance of the Quality Management System and any need for improvement.

10. QMS Document and Records Control (DWQMS Element #5)

A Document and Records Control Procedure is in place that describes how documents and records required by the QMS are:

- Kept current, legible and readily identifiable
- Retrievable
- Stored, protected, retained and disposed of

The Document and Records Control Procedure 01.00 outlines the process and documents the requirements.

11. Drinking Water System (DWQMS Element #6)

Overview

The Eganville Drinking Water System is owned and operated by the Township of Bonnechere Valley and provides a potable water supply to the residents and business of the Village of Eganville. The system generally consists of a Water Treatment Plant (WTP), a distribution system and a water standpipe.

The WTP, built in 1990, treats water from the Bonnechere River with two Graver Monoplant Package Units, which have a combined capacity of 2,070 m³/day. The distribution system originally constructed in the mid 1970's consists of approximately 13 km of piping ranging in diameter from 150 mm to 250 mm with a 300,000 Imperial gallon (1,363 m³) capacity steel standpipe for pressure equalization and supply.

Raw Water Supply

The source water for the Eganville Water System is the Bonnechere River, which originates in Algonquin Park and flows to the Ottawa River.

The water intake consists of an adjustable polyethylene intake structure situated approximately 30 metres offshore. Water flows from the river intake through a 400 mm diameter, 61 m long polyethylene pipe to a screened wet well located within the WTP.

Treatment Process

Raw water is pumped from the wet well through a single header equipped with a flow meter and is treated with sodium hypochlorite (pre-chlorination), PAS-8 (aluminum sulfate based coagulant) and Superfloc C-492PWG (polymer) prior to an in-line static mixer before entering the treatment units (Monoplants).

Two Graver Monoplant package units, each rated for a maximum flow of 1,035 m³/day, for a total flow of 2,070 m³/day, provide coagulation, flocculation, sedimentation and filtration. Each unit consists of one clarifier comprised of a centre cone draft tube, sludge recirculation and mixing zone, flocculation zone and settling zone with 60 degree settling tubes. Clarified water flows through a splitter box to a two compartment, dual media (sand and anthracite) filter. Each filter has an air scour system and a gravity operated backwash system.

Water from each filter unit is continuously monitored for turbidity prior to discharging into the 119 m³ filtered water well. Filtered water is then pumped by three submersible pumps into a splitter box where it is divided between two granular activated carbon (GAC) filters. Finished water from the GAC filters is continuously monitored for turbidity and then treated with sodium hypochlorite prior to being discharged into a series of three unbaffled clear wells and two high lift wells, which have a total volume of 710 m³.

The high lift wells are equipped with three vertical turbine pumps each rated at 26 L/sec which discharge to a common treated water header equipped with a flow meter and a continuous chlorine analyzer prior to discharge into the water distribution system.

Backup Electrical Power Supply

In the case of an electrical supply disruption the water treatment plant is equipped with a permanent 300 Kw diesel powered generator which has the capacity to provide power for the entire facility including the adjacent Queen St. sewage pumping station. The water standpipe control panel has a UPS and a connection for a mobile generator hookup if required.

Process Waste Residuals Management

Filter backwash water and Monoplant sludge is discharged via piping into a concrete holding tank and then pumped into the sanitary sewer system for treatment at the Eganville Sewage Treatment Plant.

Distribution System and Bruce Street Standpipe

Treated water is pumped from the high lift wells into the distribution system which consist of approximately 13 km of piping, generally ranging in diameter from 150 mm (6") to 200 mm (8") with a few pipes that are 250 mm (10") in diameter. Pipes are generally PVC or ductile iron with the majority being installed in the early 1970's. There are 65 hydrants and 537 metered service connections on the system serving a population of approximately 1,300. A 300,000 lgal (1,363 m³) water standpipe, built in 1974, is located at a relatively high elevation on the system for pressure equalization and for water supply when the high lift pumps at the WTP are cycled off.

The Bruce Street Standpipe was refurbished in 2017 with new exterior paint and safety upgrades.

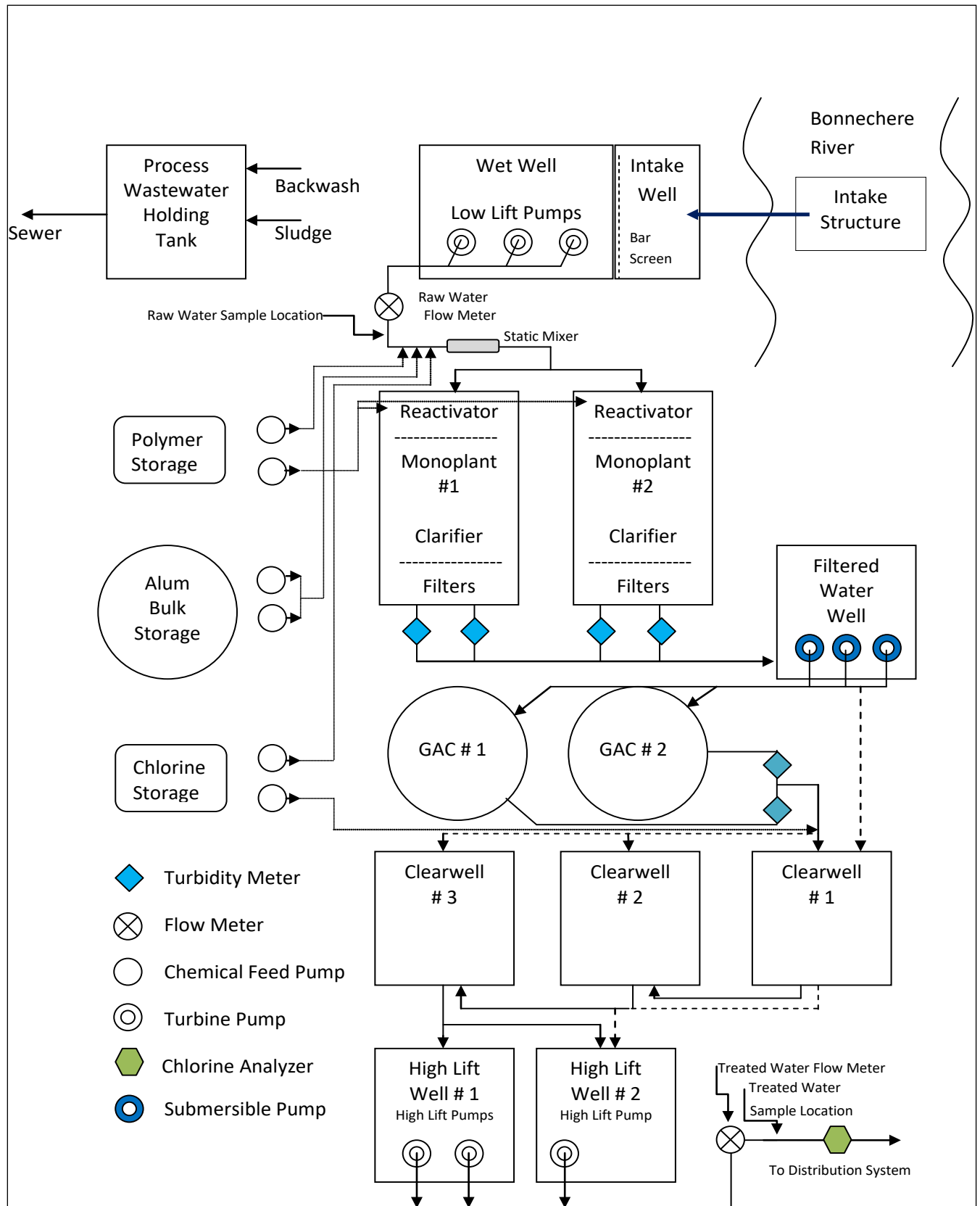
Water Quality Monitoring

An extensive monitoring program is in place for both the treatment process and distribution system. All current Provincial requirements are being met for sampling with the resultant analysis meeting or exceeding the water quality standards.

Process Management

Instrumentation and process control was updated in 2009/2010 with the installation of a new Motor Control Centre (MCC) and a Programmable Logic Controller (PLC). An associated Supervisory Control and Data Acquisition (SCADA) system enables Operators to have full control over the water treatment process and maintain a current record of all activities.

Water Treatment Process Flow Chart



Water Distribution System

A map of the Water Distribution System showing the location of the Water Treatment Plant, distribution system piping, main valves, hydrants, service connections and the water standpipe is attached as **Figure 1**).

Source Water Overview

General

The Bonnechere River watershed encompasses a total area of approximately 2,400 km² stretching from the headwaters in Algonquin Park to the Ottawa River. The watershed upstream from Eganville meanders through the forested and rocky Precambrian Highlands of the Canadian Shield and widens at several locations into Round Lake and Golden Lake. Golden lake is approximately 12 Km upstream of Eganville. Hurds Creek, which drains Lake Clear, enters the Bonnechere River approximately 1 Km upstream of Eganville.

The water from the Bonnechere River is typically very low in turbidity, low in colour, slightly basic and low in alkalinity. Temperature fluctuates significantly throughout the seasons ranging from 4° Celsius in the winter to as high as 25° Celsius during the summer. Chemical and bacteriological analysis of the raw water indicates a source of relatively good quality.

Events

Changes in water temperature may impact the treatment process performance and operators must be prepared to make appropriate and timely adjustments to treatment chemicals in response to temperature fluctuations.

Potential Threats

Watershed drought conditions may occur reducing the flow of water in the Bonnechere River. The intake for the Eganville Water Treatment Plant is located within the reservoir created by the Eganville Dam and Generating Station. Under the Bonnechere River Water Management Plan the dam operating regime address the need for maintaining a suitable reservoir level.

Some risk of plugging of the intake by water borne debris exists.

Operational Challenges

The Bonnechere River provides relatively good quality source water, which is, for the most part consistently low in bacteriological contamination and turbidity. The most significant challenge related to the source water is related to the seasonal temperature change which requires

operator response on chemical feed dosage rates to ensure appropriate coagulation, flocculation, sludge settling and filtration.

12. Risk Assessment (DWQMS Element #7) and Risk Assessment Outcomes (DWQMS Element #8)

A risk assessment process has been developed that:

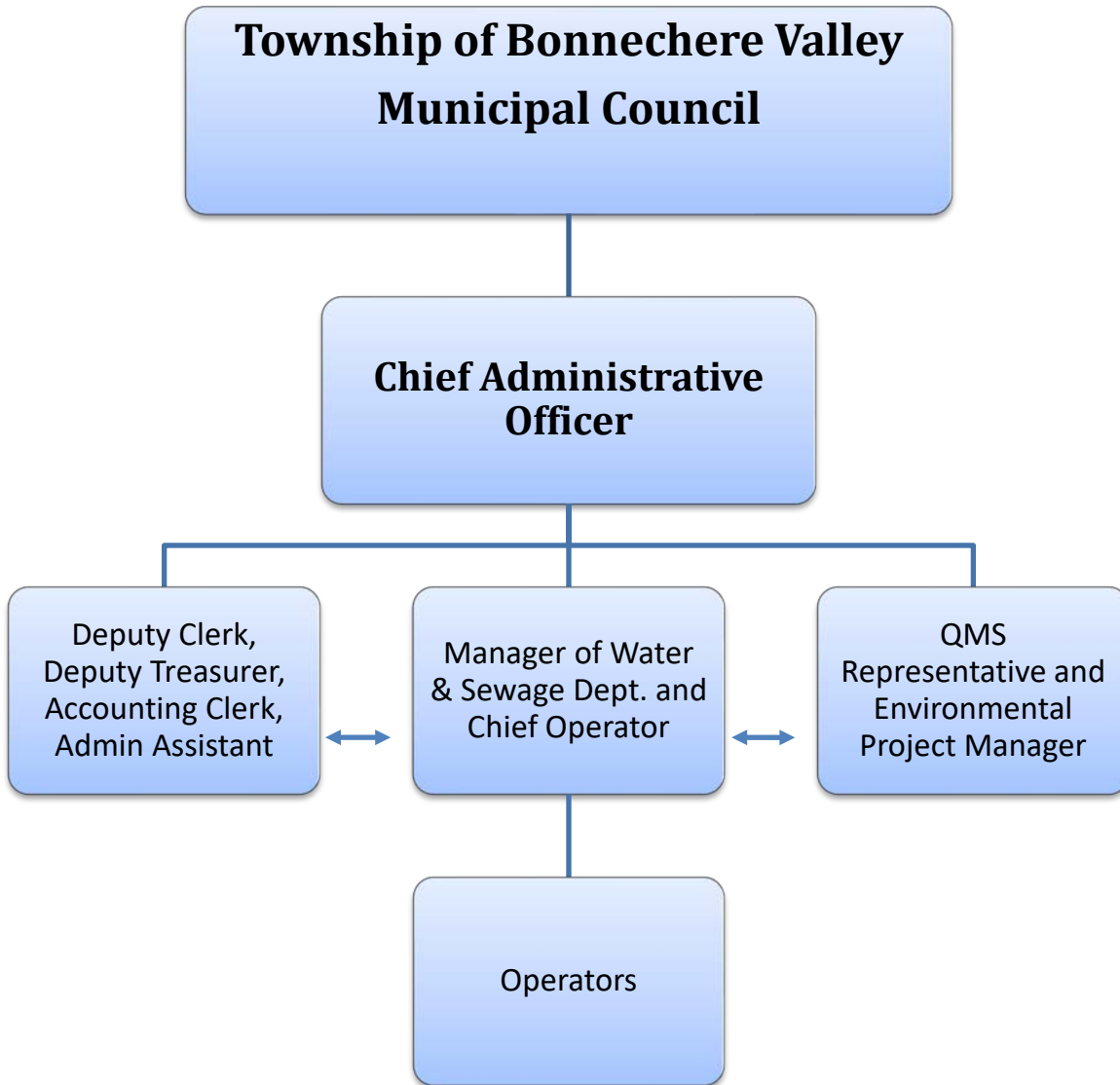
- Considers potential hazardous events and associated hazards, as identified in the Ministry's document, 'Potential Hazardous Events for Municipal Residential Drinking Water Systems',
- Identifies additional potential hazardous events and associated hazards,
- Assesses the risks associated with the occurrence of hazardous events,
- Identifies control measures to address the potential hazards and hazardous events,
- Ranks the hazardous events according to the associated risk,
- Identifies Critical Control Points and their respective Critical Control Limits,
- Outlines procedures and/or processes to:
 - Monitor the Critical Control Limits,
 - Respond to deviations from the Critical Control Limits,
 - Report and record deviations from the Critical Control Limits,
- Considers the reliability and redundancy of equipment,
- Is considered as part of the annual Management Review to ensure the currency and validity of the information,
- Ensures that the risks are assessed at least once every thirty-six months.

The Risk Assessment and Outcomes is detailed in the following Procedures:

- Procedure 03.00 – Risk Assessment and Risk Assessment Outcomes
 - Appendix 03.01 – Risk Assessment Table
- Procedure 04.00 - Critical Control Points, Limits & Response
 - Appendix 04.01 – Critical Limit Response Instructions

**13. Organizational Structure, Roles, Responsibilities and Authorities
(DWQMS Element #9)**

Organization Chart



Roles, Responsibilities and Authorities

Title	Responsibilities	Authorities
Township of Bonnechere Valley Council (Owner & Operating Authority)	<ul style="list-style-type: none"> • Standard of Care (Safe Drinking Water Act) <ul style="list-style-type: none"> ○ exercise the level of care, diligence and skill in respect of a municipal drinking water system that a reasonably prudent person would be expected to exercise in a similar situation; and ○ act honestly, competently and with integrity, with a view to ensuring the protection and safety of the users of the municipal drinking water system. • Ensuring the provision of safe and reliable municipal water supply to the serviced areas of the Village of Eganville • Ensuring operations are performed according to regulatory requirements • Ensuring that the DWQMS is maintained • Obtaining resources or infrastructure as necessary 	To perform listed responsibilities

Title	Responsibilities	Authorities
Chief Administrative Officer	<ul style="list-style-type: none"> • Same responsibilities as Municipal Council • Provides administrative support and direction • Represents ‘Top Management’ for QMS • Appoints QMS Representative 	To perform listed responsibilities

Title	Responsibilities	Authorities
QMS Representative and Environmental Project Manager	<ul style="list-style-type: none"> • Standard of Care (Safe Drinking Water Act) <ul style="list-style-type: none"> ○ exercise the level of care, diligence and skill in respect of a municipal drinking water system that a reasonably prudent person would be expected to exercise in a similar situation; and ○ act honestly, competently and with integrity, with a view to ensuring the protection and safety of the users of the municipal drinking water system. • Administers the Quality Management System by ensuring that processes and procedures needed for the Quality Management System are established and maintained; 	To perform listed responsibilities

Title	Responsibilities	Authorities
	<ul style="list-style-type: none"> • Ensures that current versions of documents required by the Quality Management System are being used at all times; • Ensures that personnel are aware of all applicable legislative and regulatory requirements that pertain to their duties for the Eganville Drinking Water System; • Promotes awareness of the Quality Management System throughout the Water & Sewage Department; • Reports to Top Management on the performance of the Quality Management System and any need for improvement; • Provides staff with technical and administrative direction related to QMS document preparation • Oversees QMS training for staff; • Prepares, reviews and approves QMS documentation; • Determines when ‘Internal and/or External Audits’ are required and arranges for undertaking; • Completes and documents ‘Internal Audits’ as required; • Prepares and administers Corrective Action Reports (CAR) and/or Opportunity For Improvement reports (OFI); • Ensures ‘Corrective Actions’ and ‘Opportunity For Improvements’ are undertaken; • Determines when ‘Management Reviews’ are required and arranges for meeting with ‘Top Management’; • Prepares agenda and documentation for ‘Management Review’ meeting; • Chairs ‘Management Review’ meeting and takes minutes of proceedings; • Responsible for communication and implementation of ‘Management Review’ action items; • Prepares summary report of the results of the ‘Management Review’ for CAO and Public Works Committee; • Maintains DWQMS accreditation with NSF International Strategic Registrations (NSF-ISR). 	

Title	Responsibilities	Authorities
Water & Sewage Dept. Manager and Chief Operator	<ul style="list-style-type: none"> • Standard of Care (Safe Drinking Water Act) <ul style="list-style-type: none"> ○ exercise the level of care, diligence and skill in respect of a municipal drinking water system that a reasonably prudent person would be expected to exercise in a similar situation; and ○ act honestly, competently and with integrity, with a view to ensuring the protection and safety of the users of the municipal drinking water system. • Represents ‘Top Management’ for QMS • Responsible for the daily operation and maintenance of the water treatment plant, water standpipe and distribution system in accordance with legislated requirements, QMS and industry standards • Reports adverse water quality incidences to regulatory agencies, the owner, top management and the public • Maintains regulatory compliance • Is the Eganville Drinking Water System Overall Responsible Operator • Supervises Operators • Schedules work assignments • Undertakes ‘‘On-call’’ duties after regular hours and on weekends, when scheduled • Monitors water quality and demand • Undertakes the required training to maintain Operator Certification at the level required for the Eganville Drinking Water System • Develops Departmental budget • Communicates with Council about the Drinking Water System and the QMS • Reports and acts on QMS non-conformances • Knowledgeable and compliant with all health and safety requirements • Receives and responds to public complaints 	To perform listed responsibilities
WTP Operator	<ul style="list-style-type: none"> • Under the supervision of the Manager/Chief Operator is responsible for the daily operation and maintenance of the Eganville Drinking Water System in accordance with legislated requirements, QMS and industry standards 	To perform listed responsibilities

Title	Responsibilities	Authorities
	<ul style="list-style-type: none"> • Undertakes the required training to maintain Operator Certification at the level required for the Eganville Drinking Water System • Performs the duties of the Overall Responsible Operator (ORO) and Operator in Charge (OIC) when designated • Undertakes “On-call” duties after regular hours and on weekends, when scheduled • Knowledgeable and compliant with all health and safety requirements 	

14. Competencies (DWQMS Element #10)

The following is an overview of the ‘Required Competencies’ for the management and operational staff of the Eganville Drinking Water System. Additional details are in the individual job description files. Competencies of Operators are maintained and further developed as outlined in the Training and Certification Plan (SOP 240.60.01). Awareness of the relevance of their duties and how they affect safe drinking water is included in annual Performance Reviews.

Role	Required Competencies
<p>Manager and Chief Operator</p>	<ul style="list-style-type: none"> • WTP Class II Certification • Distribution Class 1 Certification • Overall Responsible Operator (ORO) • Operator in Charge (OIC) • Administrative Skills and Experience (includes working knowledge of MS Word / Excel and Cartegraph OMS) • Supervisory Skills and Experience • WHMIS 2015 Certification • Transportation of Dangerous Goods Certification • SCADA Operational Knowledge • Confined Space Entry Certification • Traffic Control Certification • First Aid (including CPR) Certification • QMS Awareness

Role	Required Competencies
Class II Operator	<ul style="list-style-type: none"> • WTP Class II Certification • Distribution Class 1 Certification • Overall Responsible Operator (ORO) • Operator in Charge (OIC) • WHMIS 2015 Certification • SCADA Operational Knowledge • Confined Space Entry Certification • Traffic Control Certification • First Aid (including CPR) Certification • Working knowledge of MS Word / Excel and Cartegraph OMS • QMS Awareness
Class I Operator	<ul style="list-style-type: none"> • WTP Class I Certification • Distribution Class 1 Certification • WHMIS 2015 Certification • SCADA Operational Knowledge • Confined Space Entry Certification • Traffic Control Certification • First Aid (including CPR) Certification • Working knowledge of MS Word / Excel and Cartegraph OMS • QMS Awareness

Certification and Training Record					
Employee	Role	Certification level	Expiry Date	Hours of Training Required	Training Cycle
Daryl Verch	Manager & Chief Operator	WT 2 - #6578 WD 1 - #6579	Aug. 31, 2022 Aug. 31, 2022	105	Aug. 31, 2019 to Aug. 31, 2022
Dave Loader	Operator	WT 2 - #64885 WD 1 - #68239	Sept. 30, 2022 Nov. 30, 2022	105	Sept. 30, 2019 to Sept. 30, 2022
Cody Tiedemann	Operator	WT 2 - #84733 WD 1 - #89854	Nov. 30, 2021 June 30, 2021	105	Nov. 30, 2018 to Nov. 30, 2021

Detailed records are maintained for all operations staff and are in the Training and Certification Records file (240.50) at the Eganville WTP Office.

15. Personnel Coverage (DWQMS Element #11)

The Eganville Drinking Water System, which includes the water treatment plant, the Bruce St. standpipe and the distribution system, is normally staffed with a Chief Operator / Manager and two Operators from 7:30 am until 4:00 pm Monday to Friday. The on-call Operator attends the water treatment plant on the weekend and statutory holidays to check on the operation and perform any necessary tasks.

The designated Overall Responsible Operator (ORO) and the Operator in Charge (OIC) is posted on the Work Schedule calendar and recorded in the Daily Log Book. The OIC designation is shared between the Level 2 Operators.

The water treatment plant is equipped with alarms on all of the critical process equipment including the Bruce St. standpipe water level. After hour's coverage (nights, weekends and statutory holidays) is carried out by the on-call Operator who carries a dedicated cell phone. In the event of an alarm situation the alarm company will call the on-duty Operator. The Operator will respond immediately (within 15 minutes) to the Water Treatment Plant to assess and correct the alarm situation.

After hour emergency calls, i.e. service line breaks, are directed to the cell phone of the on-duty Operator. The Operator will respond accordingly to the emergency call.

In the unforeseen circumstance where all Operators are unavailable to operate the system or respond to an emergency the CAO would contact one of the adjacent Municipalities and/or OCWA for assistance. An informal agreement is in place with the City of Pembroke to provide Operators as required.

16. QMS Communications (DWQMS Element #12)

Relevant aspects of the Quality Management System are conveyed on a regular basis by Top Management, with the assistance of the QMS Representative, to the various parties associated with the Eganville Drinking Water System.

These would include:

- The Owner and Operating Authority, represented by the Mayor, Council and CAO.
- The Water and Sewage Department staff.

- Essential Supply and Service Providers.
- The Public, those connected to the Eganville Drinking Water System.

QMS Communications Procedure (PRO - 05.00) outlines the methods used to effectively communicate the relevant aspects of the Quality Management System to the target audiences.

17. Essential Supplies and Services (DWQMS Element #13)

Supply and Service Providers

Appendix A. to the QMS Operational Plan provides a current list of Supply and Service Providers. The list provides the nature of the supply or service, the primary provider and the contingency provider if applicable.

Quality of Supplier Products and Services

Assurance of the quality of essential supplies and services is achieved through review of applicable accreditation, licenses and certifications as appropriate.

Suppliers of process chemicals and filter media are required to provide a Certificate of Analysis and/or verification that the product meets NSF/ANSI 60 and/or NSF/ANSI 61 standards.

Procurement

Orders are placed when a pre-determined quantity of process chemical or filter media is reached. All process chemical or filter media suppliers provide written confirmation of NSF/ANSI 60 and/or NSF/ANSI 61 conformance, cost, availability and delivery information when an order is placed.

18. Review and Provision of Infrastructure (DWQMS Element #14)

An annual review of the adequacy of the infrastructure necessary to operate and maintain the Eganville Drinking Water System will be undertaken. This review will be based on the Assessment Management Plan documentation and reports generated from the Cartegraph Operational Management System (OMS). Consideration will also be given to the Risk Assessment Outcomes documented in Section 15. of the Operational Plan.

The review will assist in the update of the Assessment Management Plan and identify the need for infrastructure repairs, replacements or alterations with an associated priority.

This information will be summarized and included in the Annual Summary Report presented to Council for review and acceptance.

19. Infrastructure Maintenance, Rehabilitation and Renewal (DWQMS Element #15)

An Operational Management System (OMS) is in place to manage the maintenance, rehabilitation and renewal of the infrastructure associated with the Eganville Drinking Water System. The OMS consists of an integrated asset inventory, condition assessments, assigned maintenance schedules, work orders, data processing and reporting functions.

Planned Maintenance

Planned maintenance activities exist for both the water treatment plant facility operations and the water distribution system and are fully documented in the OMS. The maintenance schedule and activity are typically defined in Operation and Maintenance manuals, manufacturers literature, Industry's Best Management Practices or required by legislation.

In general, the following assets have planned maintenance activities:

- Instrumentation
- Stand-by Generators
- Process Equipment
- Chemical Feed Systems
- Valves
- Hydrants
- Watermains

Planned maintenance activities are assigned by the Manger to the Operators utilizing the OMS work order module. Once the activity is completed the Operator enters the required information into the work order.

Unplanned Maintenance

Unplanned maintenance activities may occur as a result of process upsets, equipment malfunction, watermain breaks, etc. and are typically responded to by the Operators as required.

The Manager will create a work order for the unplanned maintenance utilizing the OMS work order module to document the activity.

Measures to prepare for and expedite unplanned maintenance includes equipment redundancy, spare parts inventory, availability of updated plans as well as documented repair and safety procedures.

Maintenance Program Review

The effectiveness of the maintenance program will be reviewed on an annual basis by assessing the amount of planned versus unplanned maintenance activity. If required, adjustments will be made in the OMS program to better reflect the maintenance requirements. Additionally, the assessment will be used to identify assets that may require rehabilitation or renewal.

The results of the maintenance program review will be included in the Management Review Report.

Rehabilitation and Renewal

During the annual review of the adequacy of the infrastructure necessary to operate and maintain the Eganville Drinking Water System the need for infrastructure repairs, replacements or alterations with an associated priority will be identified. This information will be considered during the budget process to ensure the rehabilitation and renewal of identified assets as required.

Long Term Forecast – Maintenance, Rehabilitation and Renewal

The Asset Management Plan annual review and update will document the long-term forecast of major infrastructure maintenance, rehabilitation and renewal activities.

20. Sampling, Testing and Monitoring (DWQMS Element #16)

The sampling, testing and monitoring program for process control and finished drinking water quality is based on the requirements of the Safe Drinking Water Act and Regulations, Facility Operating Manuals, Ministry Protocols and Guidelines, internal Standard Operating Procedures and the Water Industry's Best Management Practices.

Procedure 07.00 Water Quality Sampling, Monitoring and Analysis describes the sampling and monitoring schedule along with the analytical parameters as summarized below:

- Continuous Monitoring
 - Filter Effluent Turbidity
 - Treated Water Free Chlorine Residual
- Daily
 - Temperature
 - pH
 - Colour
 - Alkalinity
 - Free and Total Chlorine Residual
- Weekly
 - Turbidity
 - Aluminum
 - Microbiological
- Quarterly
 - Trihalomethanes (THM's)
 - Haloacetic Acids (HAA's)
 - Nitrates
 - Nitrites
- Annually
 - Schedule 23 Inorganics
 - Schedule 24 Organics
 - Sodium
 - Fluoride

Procedure 07.01 Response to Adverse Test Results, Reporting and Corrective Action provides detailed instructions to the Operators upon being notified of or observing adverse test results or other problems. In general, this would include adverse test results related to:

- Microbiological
- Chemical
- Operational
- Improperly disinfected water
- Low distribution chlorine
- High turbidity

Water samples are collected and analyzed for compliance and operational parameters by the Operators. A number of samples are analyzed in the Water Treatment Plant Laboratory while the remaining samples are submitted to an accredited Laboratory. Analytical results are recorded in a spread sheet format on a daily basis and reviewed by the Operator in Charge (OIC) and/or the Manager.

All analytical results are summarized and discussed in the 'Eganville Drinking Water System' Annual Summary Report. The Report is presented to the Public Works Committee and is posted on the Municipal web site.

21. Measurement and Recording Equipment - Calibration and Maintenance (DWQMS Element #17)

The calibration and maintenance of all measurement and recording equipment is undertaken by the Operators and/or contract Instrument Technicians on a frequency required by regulation and/or recommended by the manufacture. Calibration and maintenance are also carried out when equipment fails.

Details of the calibration and maintenance program are outlined in Procedure 08.00

22. Emergency Management (DWQMS Element #18)

An Emergency Management Procedure is in place to address potential emergency situations or service interruptions which were identified in the Risk Assessment exercise.

The Emergency Management Procedure 09.00 documents:

- The potential emergency situations or service interruptions that might occur,
- Responsibilities of the Operators, Management and Municipal Emergency Coordinator if required,
- The Emergency Contact List, updated as required,
- Communication, response and recovery activities,
- Emergency response training and testing requirements,
- When the Municipal Emergency Management Plan may be initiated to provide additional support.

23. Internal Audits (DWQMS Element #19)

An Internal Audit Procedure is in place to:

- Evaluate conformity of the Eganville Drinking Water Quality Management System (QMS) with the Drinking Water Quality Management Standard (DWQMS),
- Identify the internal audit criteria, frequency, scope, methodology and record-keeping requirements,
- Consider previous internal and external audit results,
- Describe how QMS Corrective Actions are identified and initiated.

Internal Audit Procedure 10.00 and the associated Appendices address these requirements and provide the required documentation.

24. Management Review (DWQMS Element #20)

A Management Review Procedure is in place to document the elements required to evaluate the continuing suitability, adequacy and effectiveness of the QMS.

Top Management shall implement and conform to the procedure and shall:

- Ensure a management review is conducted at least once every Calendar Year,
- Consider the results of the management review and identify deficiencies and actions items to address the deficiencies,

- Provide a record of any decisions and action items related to the management review including the personnel responsible for delivering the action item and the proposed timelines for their review, and
- Report the results of the management review, the identified deficiencies, decisions and action items to the Owner.

Management Review Procedure 11.00 and the associated Appendices address these requirements and provide the required documentation.

25. Continual Improvement (DWQMS Element #21)

A Continual Improvement Procedure has been developed for tracking and measuring continual improvement to the QMS.

This will be done by:

- Reviewing and considering applicable best management practices at least every 36 months,
- Documenting a process for identification and management of QMS Corrective Actions,
- Documenting a process for identifying and implementing Preventative Actions to eliminate the occurrence of potential non-conformities in the QMS.

Continual Improvement Procedure 12.00 addresses these requirements and provides the required supporting documentation.