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Drinking Water Quality Management System

Operational Plan

Operating Authority # 0841261

Millbrook Drinking Water System

November 18, 2025, Revision No. 1.2

Table of Revisions

Revisions #	Date	Section	Change	Approved By
0	February 2025	3,4,6,9,11,13, 16,17,18	Developed Operational Plan for Limited Scope Transitional (LST) Audit	W. Hancock
1	August 2025	1,2,5,7,8,9, 10,12,13,14, 15,19,20,21 6 13 18	Completed Full Scope Operational Plan Add the length of the three different sizes of watermain in the distribution system. Revised to focus on supplies and services, rather than the suppliers and service providers. Updated Emergency Response Training section to specify training should be provided for potential emergencies or service interruptions. Included reference to the potential emergency or service interruption under the Emergency Response Training section.	W. Hancock
1.1	September 2025	10 15 20	10.3 System implemented to track operator license renewals. 15.2 and 15.3 were updated to acknowledge the long-term forecast to satisfy 15 (b) of the DWQMS. 20.7 added to address reporting management review findings to the owner.	C. Hiltz

1.2	November 2025	6 17 9,14,18,19	6.3 Added Schematic A, a process flow diagram of the WTP. 17.5 Revised equipment calibration schedules. 17.6 Added reference to SOP-009 Calibration and Verification of Monitoring Equipment. Minor administrative updates.	C. Hiltz

Table of Contents

Introduction 5
Definitions and Acronyms 7
1. Quality Management System 8
2. Quality Management System Policy 8
3. Commitment and Endorsement 9
4. Quality Management System Representative 10
5. Document and Record Control 10
6. Drinking Water System 13
7. Risk Assessment 16
8. Risk Assessment Outcomes 20
9. Organizational Structure, Role, Responsibilities and Authorities 20
10. Competencies 24
11. Personnel Coverage 26
12. Communications 27
13. Essential Supplies and Services 29
14. Review and Provision of Infrastructure 30
15. Infrastructure Maintenance Rehabilitation and Renewal 32
16. Sampling, Testing and Monitoring 34
17. Measurement and Recording Equipment Calibration and Maintenance 37
18. Emergency Management 38
19. Internal Audit 42
20. Management Review 44
21. Continual Improvement 46

Introduction

The Ministry of Environment, Conservation and Parks require owners of municipal water systems to obtain a Municipal Drinking Water Licence. To obtain a licence, the owner must have the following components:

1. **Drinking Water Works Permit**– covers establishment or alteration of a system.
2. **Permit to Take Water** – required if the system withdraws ≥ 50,000 litres/day.
3. **Operational Plan** – based on the Drinking Water Quality Management Standard.
4. **Accredited Operating Authority** – an independent third-party audit must confirm that the operating body meets DWQMS requirements.
5. **Financial Plan** – a long-term capital and operating funding forecast. It must be approved by the municipal council and submitted to the Ministry.

Municipal Drinking Water Licence

The Township of Cavan Monaghan's licence, #136-101, requires renewal every five years; the current one, issued June 2021, will expire June 2026. The licence itself is comprised of the following:

Schedule A – Drinking Water System Information

This includes pertinent dates and permit numbers for the licence, permit, financial plans and accredited operating authority.

Schedule B – General Conditions

This section outlines the requirements for the licence such as, but not limited to, the renewal date, compliance components, availability of documents, a financial plan, records retention, chemicals and materials standards, updating drawings, operations and maintenance manual. For the complete list and details of each, refer to the current licence.

Schedule C – System-Specific Conditions

System specific conditions include the requirements for additional sampling, testing and monitoring, and the allowance of environmental discharges under very specific circumstances so as to not cause adverse effects in association with maintenance and repair of the drinking water system.

Schedule D – Conditions for Relief from Regulatory Requirements

Under Schedule D, The Township of Cavan Monaghan does not have any form of relief outlined.

Schedule E – Pathogen Log Removal/Inactivation Credits

Under this section outlined is the type and requirements of disinfection for the raw water supply.

Drinking Water Works Permit

The Township of Cavan Monaghan's permit, #136-201, does not expire; however, the Ministry may issue an updated permit if it made any changes to the provincially issued permit template. The most recent permit was issued June 2021. The permit itself is comprised of the following:

Schedule A – Drinking Water System Description

This section identifies the length of the distribution system, references the map(s) that comprise the distribution system and specifies that any addition, modification, replacement or extension documented in Schedule C or authorized by the Director is included as the distribution system.

Schedule B – General

This section identifies pre-approved alterations to the system by means of addition, modification, replacement and extension; exemptions from pre-authorization; requirements for minor modifications of system components; and requirements for notification of alterations and modifications.

Schedule C – Authorized Alterations to the Drinking Water System

All completed and approved MECP forms – Forms 1, 2 and 3 and Director Notification: Alterations to a Drinking Water System, become part of the permit as Schedule C and are subject to the same terms of the permit and the licence.

Schedule D – Process Flow Diagrams

This section illustrates the Millbrook Pumphouse flow diagram.

Permit to Take Water

The Township of Cavan Monaghan has a Permit to Take Water #1150-CZXQTQ and is valid until March 2034. This Permit allows the Township to withdraw a total of 3,000,000 litres of water per day from the three groundwater wells.

Financial Plan

As per Ontario Regulation 453/07, the financial plan must be approved by Council prior to its submission for renewal; it must include the renewal year plus a five-year forecast, for a total of a six-year period.

Accreditation

All drinking water systems are required to be operated and maintained by an accredited operating authority. Accreditation is granted and verified by a third-party accreditation body where the operating authority has documented and implemented a QMS that meets the requirements of the Standard. The Township of Cavan Monaghan's QMS is documented within this Operational Plan.

Operational Plan

This document serves to satisfy the requirement of having an Operational Plan. All 21 elements prescribed in the Drinking Water Quality Management Standard are documented within.

Definitions and Acronyms

SDWA – Safe Drinking Water Act, 2002; or the "Act"

Director – means the director appointed for the purposes of s.15 of the Act

Distribution – means the part of a drinking water system that is used in the distribution, storage or supply of water and that is not part of a treatment system, e.g., watermains and related assets (hydrants, valves)

Municipal Drinking Water System – a drinking water system or part of a drinking water system, as defined in s.2(1) of the Act

Township – The Township of Cavan Monaghan

SOP – Standard Operating Procedure

DWQMS – Drinking Water Quality Management Standard

DWWP – Drinking Water Works Permit

MDWL – Municipal Drinking Water Licence

MECP – Ontario Ministry of the Environment, Conservation and Parks

ORO – Overall Responsible Operator

Owner – means the municipality or municipalities that are responsible for the establishment or operation of the system, this includes Council.

QMS – Quality Management System

DWQMS - Drinking Water Quality Management Standard

Quality Management System Policy – means the policy described in Element 2 developed for the Subject System

Top Management – a person, or persons or a group of people at the highest management levels within an operating authority that makes decisions about the QMS and makes recommendations to the owner about the subject system or subject systems

1. Quality Management System

1. Purpose

To describe in detail the Drinking Water Quality Management Standard that was developed and implemented by the Township of Cavan Monaghan, as the Owner and Operating Authority, of the operation of the Millbrook Drinking Water System. The policies and procedures outlined in this Operational Plan are in accordance with the requirements of the Ministry of Environment, Conservation and Parks Municipal Drinking Water Licensing Program for all Drinking Water Systems in the province of Ontario.

2. Procedure

The Operational Plan documents twenty-one (21) elements of the DWQMS and provides an understanding of the Drinking Water system, the responsibilities of the Owner and Operating Authority of the water system, and a commitment to the provision of safe drinking water. This allows the Township of Cavan Monaghan to plan, implement, check, and continually improve the Millbrook Drinking Water System, thereby ensuring ongoing confidence and security in the quality of the drinking water.

3. Related Documents

Drinking Water Quality Management Standard – Element 1

Safe Drinking Water Act – 2002

2. Quality Management System Policy

1. Purpose

To demonstrate the Township's commitment to managing the DWS by effectively establishing, maintaining and continually improving the Quality Management System to help ensure its customers are provided with safe drinking water at all times. Customer confidence in the drinking water quality shall be accomplished through the proactive approach to meet or exceed applicable drinking water legislation, regulations and standards.

2. Quality Management System Policy

The Township's QMS Policy is:

- Maintain and continually improve the QMS for the Millbrook DWS;
- Comply with all applicable legislation, regulations, permits and licenses; and
- Provide safe drinking water for all customers.

3. Related Documents

Drinking Water Quality Management Standard – Element 2

3. Commitment and Endorsement

1. Purpose

To communicate the Owner and Top Management's commitment to and endorsement of the Quality Management System described in this operational plan.

2. Commitment and Endorsement

In accordance with Element 3 of the Drinking Water Quality Management Standard, the Township of Cavan Monaghan, as the Owner and Top Management, supports the implementation and maintenance of the Drinking Water Quality Management System, as documented in this Operational Plan. This Commitment by Top Management extends beyond agreement in principle to active participation in the development and/or review of policies that promote continual improvement. Endorsement by the Owner and Top Management acknowledged the need for and supports the provision of sufficient resources to maintain the DWQMS.

Top Management

12/02/2025
Date

Chief Administrative Officer
Yvette Hurley

12/02/2025
Date

Director of Public Works
Wayne Hancock

12/11/2025
Date

Director of Finance/Treasurer
Kimberley Pope

4. Quality Management System Representative

1. Purpose

To identify the role of the Quality Management System Representative for the Township of Cavan Monaghan and describe the specific responsibilities and authorities placed upon the Representative.

2. Quality Management System Representative

The Water Wastewater Compliance Coordinator, Township of Cavan Monaghan, was appointed by Top Management to the role of QMS Representative for the Millbrook Municipal Water System.

The QMS Representative holds the following responsibilities and authorities (irrespective of other responsibilities):

- Administers the QMS by ensuring that processes and procedures needed for the QMS are established and maintained.
- Report to Top Management on the performance of the QMS and any need for improvement.
- Ensure that the current version of documents required by the QMS 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 operation of the drinking water system.
- Promote awareness of the QMS throughout the operating authority.
- The Director of Public Works, Township of Cavan Monaghan shall be designated as the alternate QMS Representative.

3. Related Documents

Drinking Water Quality Management Standard – Element 4

5. Document and Record Control

1. Purpose

To outline and define the process of managing, maintaining, and protecting documents and records for the Millbrook DWS.

2. Procedure

Records are maintained as objective evidence that the requirements of the DWQMS, applicable legislation, and regulations are effectively met, which demonstrates the suitability, adequacy and effectiveness of the QMS.

Requirements

1. All components of each record shall be clearly visible and legible.
2. Pencil, marker, whiteout, or any other erasable marker shall not be used to record process or product information or data.
3. QMS records shall be stored and made available at the Municipal Office unless otherwise states in the Townships' Records Retention By-law.
4. For QMS records, staff shall ensure that all official records under their control are protected from inadvertent damage or destruction.
5. Records may be retained in either hard copy or electronic.
6. Where required by legislation, records shall be made available for public viewing through the Township's website or by other practical means necessary.
7. QMS Rep shall ensure that all official records under their control are stored in a manner that makes them accessible for review if they are required to retrieve them for legal, auditory, or other purposes.

Creating new or Updating Existing Documents

8. The Documents Master List shall show the documents that are currently controlled under the QMS and their location.
9. Any employee from the Public Works Department whose activities may affect drinking water quality may recommend the creation or the amendment of a QMS document. All recommendations will be captured either through scheduled meeting minutes or forwarded to the QMS Representative by email for consideration.
10. The QMS Representative is responsible for ensuring consistency, applicability, legibility and relevance of information in each document.
11. All revisions made to the Operational Plan and associated procedures are summarized in the revision history table of each document. All internal forms, schedules, logs, and policies are exempt from this formatting.
12. All QMS documents can be readily identifiable by its title block, revision date, revision number and revision table (if applicable).

Distribution and Protection of Documents

13. All QMS documents are controlled by the QMS Representative. Only the QMS Representative and or their designate will have access to the original QMS documents. The QMS Representative is responsible for keeping all documentation current and up-to-date.
14. Electronic versions of documents are found on the Township's corporate drive.

15. Obsolete versions that are kept must be removed from general access.
16. The distribution section of each document indicates the locations where controlled versions of documents are found. All internal forms, schedules, logs, and policies/procedures are exempt from this formatting.
17. It is the responsibility of the QMS Representative to ensure that current versions of documents are located in the appropriate locations to ensure the effective planning, operation and control of operations.
18. The QMS Representative shall advise the Water Wastewater Staff and all other applicable staff by email that a new or revised document has been updated to the QMS. Staff are also advised to remove any old revisions of documents they may obtain. Once a QMS document is printed it is designated as uncontrolled. It is up to staff to ensure that only the newest revisions are used.

Retention

19. All records that are required to comply with applicable legislation requirements shall be maintained as per the regulations.
20. Retention times shall conform to the Records Retention By-law.
21. The Township's IT service provider is responsible for backing up the municipal servers.

Filing

22. All records shall be filed as per Records Retention By-law and O.Reg 170/03.

Disposal

23. Records that have exceeded the minimum retention times shall be removed and destroyed as per the Records Retention By-law.

Operational Plan Distribution

Copy	Location
Hard Copy	Wastewater Treatment Plant
Electronic	Corporate Drive

3. Related Documents

Drinking Water Quality Management Standard – Element 5

Document Master List

SOP-006 Document and Record Control

6. Drinking Water System

1. Purpose

The purpose of this procedure is to describe the Millbrook drinking water system owned and operated by the Township of Cavan Monaghan. It is the responsibility of the QMS Representative to ensure that this procedure is kept current.

2. Name of Owner and Operating Authority

The Corporation of the Township of Cavan Monaghan owns and operates the Millbrook Drinking Water System. Mayor and Members of Council are the Owners of the DWS and the Public Works Department is the Operating Authority.

3. Description of Drinking Water System

The Millbrook municipal water system obtains its water from three (3) drilled municipal wells Well No. 1, Well No. 2 and Well No. 3. Based on hydrogeologist's report and subsequent peer review of that report, it was concluded that the production wells are considered not to be under the direct influence of surface water.

The existing waterworks consists of three wells with the following components (Schematic A):

Well No. 1

A 250 mm Diameter 30 m deep ground water production well located approximately 40m north of King Street at a point approximately 33 meters west of George Street intersection (NAD 17:UTM Zone 17:0703038.00E, 4891261.00 N) equipped with a submersible vertical turbine well pump capable of delivering 1500L/min at a Total Dynamic Head (TDH) of 64m, driven by a 30HP electric motor, discharging to a well pump house. Well No. 1 is equipped with a magnetic flow meter, a flow control valve and a 150mm diameter gated/valved overflow line installed in the existing pumphouse.

Well No. 2

A 250 mm Diameter 30 m deep ground water production well located in a 1.75 m by 2.06 m pump chamber (NAD 17:UTM Zone 17:070344.00 E, 4891258.00 N) equipped with a submersible vertical turbine well pump capable of delivering 1500 L/min at a THD of 64 m, driven by a 30 HP electric motor, discharging header complete with a magnetic flow meter, a flow control valve and a 150 mm diameter gated/valved overflow line installed in the existing pumphouse.

Well No. 3

A 254 mm Diameter 31 m deep ground water production well located outside the main pumping station (NAD 17:UTM Zone 17:4891250.00 E, 703060.00 N) housed in a 1. 75 m by 2.06 m concrete chamber, equipped with a submersible vertical turbine well pump capable of delivering 1500L/min at a TDH of 64 m, driven by a 22.5 kW electric motor. A

150 mm diameter discharge header provided from Well No. 3 pump chamber to the existing 150 mm common discharge header in the existing Well No. 1 pumping station complete with a flow control valve, magnetic flow meter and a 150 mm diameter gated/valved overflow line installed in the existing pumphouse.

In 2023, Well No. 3 was re-lined due to a faulty casing found during routine cleaning and inspection. The liner is a 200mm, 304 stainless steel liner lowered to a depth of 25.2m and grouted in place.

Pumphouse

A 5.5 m by 5.5 m well pumphouse is located over Well No. 1 (NAD 17:UTM Zone 17:0703038.00 E, 4891261.00 N) housing a submersible vertical turbine well pump, a 150 mm discharge header, treatment and control facilities include.

Disinfection

The chlorination system uses sodium hypochlorite solution and consists of one 400 L chemical solution tank. The chemical feed system includes 2 paced-to-flow chemical metering pumps (1 duty, 1 standby) each rated at 291 L/day, complete with related instrumentation, piping, valves, mechanical and electrical equipment, and appurtenances, auto switch-over capability, 4- 20 mA signal flow meter on common treated water discharge line, a turbidity analyzer, and a chlorine residual analyzer, complete with related sampling lines connecting from the 250 mm diameter common discharge header. The system is equipped with a low chlorine residual alarm and pump shut off mechanism to prevent low chlorine or unchlorinated water to be distributed to consumers.

The chlorine contact serpentine includes 71 m of 900 mm diameter watermain at the pumphouse site complete with a 25 mm diameter air release line to the air release valve within the pumphouse, all associated appurtenances and sample lines to the chlorine residual analyzer within the pumphouse.

Water Distribution

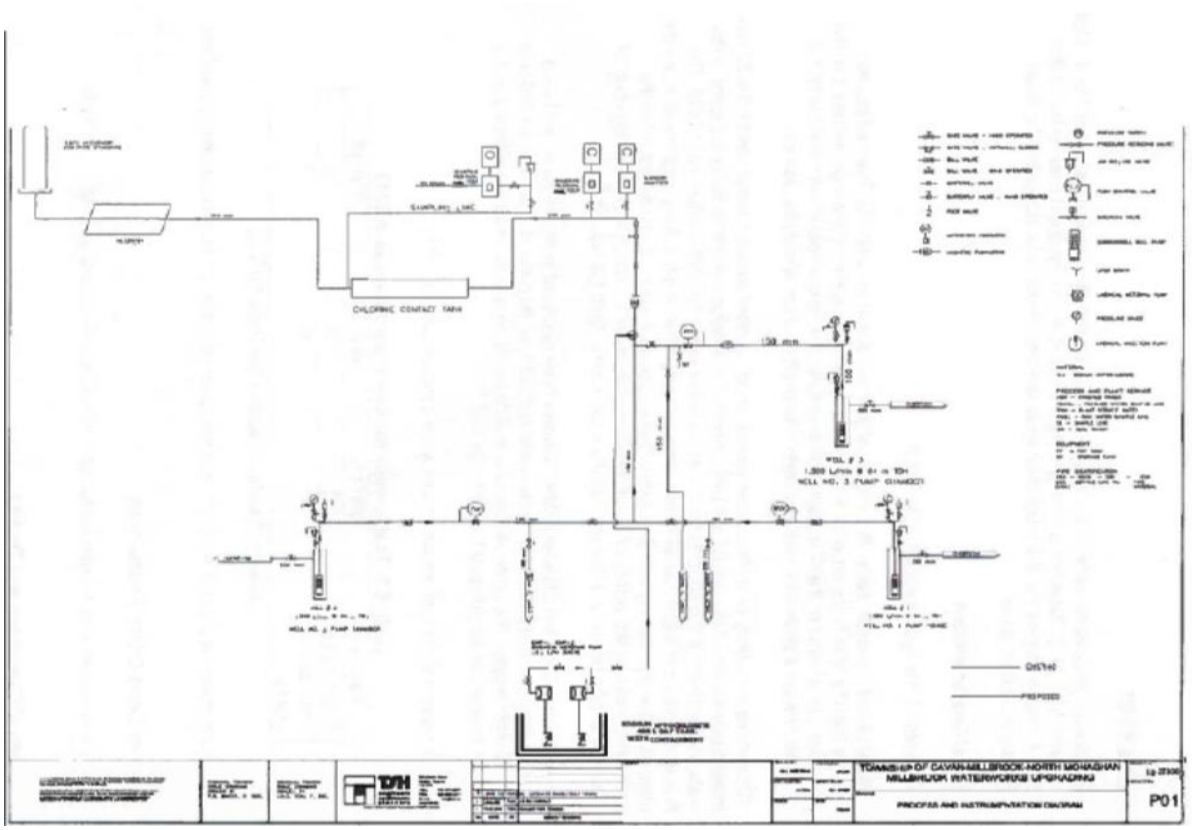
The water distribution system consists of water mains with diameters and corresponding approximate lengths of 150 mm (11,524 metres), 200 mm (100 metres), and 250 mm (3,857 metres). There is a 2600 m3 capacity standpipe located at the Township office on County Road 10 that provides storage and maintains pressure in the distribution system. A booster pumping station also located at the Township office provides pressure to the North portion of Millbrook. Fire hydrants and isolating valves are located at several locations in the distribution network. The distribution system consists of looped water mains as well as branched connections with several dead ends. Water mains are flushed once annually during spring and fall.

Operational Challenges and Threats

Use of distribution system for firefighting may result in increased flows. Contact times may be reduced if flows exceed CT calculation parameters.

Loss of standpipe communication when the standpipe is to be put out of service can be an operational challenge.

Schematic A: Millbrook Water Treatment Plant



7. Risk Assessment

1. Purpose

To define the methodology used for identifying any potential hazardous events, assessing the level of risk for each and identifying the critical control points within the drinking water system (DWS).

2. Definitions

Risk – is the probability of identified hazards causing harm, including the magnitude of the harm.

Risk Assessment – is an orderly methodology of identifying hazards or hazardous events that may affect the safety of drinking water and evaluating their significance.

Hazard – is a source of danger or property that may case drinking water to be unsafe for human consumption. The hazard may be biological, chemical, physical or radiological in nature.

Hazardous Event – is an incident or situation that can lead to the presence of a hazard. Hazards and hazardous events can result from natural or technological causes, or from human activities.

Monitoring – includes any checks or systems that are available to detect hazards or the potential for hazards.

Control Measure – includes any processes, physical steps, or other contingencies that have been put in place to prevent or reduce a hazard before it occurs.

Critical Control Point (CCP) – is an essential step or point in the system where a control is in place to prevent or eliminate a drinking water health hazard or to reduce it to an acceptable level.

Critical Control Limit (CCL) – the point at which the CCP response procedure is initiated.

3. Procedure

1. The Risk Assessment Outcomes table shall be used to document the risk assessment process. The QMS Representative is responsible for maintaining, reviewing and updating the Risk Assessment Outcomes table.

Hazardous Events and Associated Hazards Identification

2. The Risk Assessment Team will be comprised of personnel that have knowledge of the DWS. At a minimum the team shall be comprised of the following:

    a. Director of Public Works
    b. ORO/Foreman
    c. QMS Representative

3. Each activity or process step of the DWS shall be reviewed to identify potential hazards/hazardous events and shall be recorded on the Risk Assessment Outcomes table.
4. For each hazard/hazardous event, control measures (if any) shall be identified.

Ranking Risks

5. Each hazard/hazardous event identified shall be ranked by the risk assessment team according to the following criteria:
   a. Likelihood –is the probability of a hazard or hazardous event occurring
   b. Consequence – is the potential impact to health or impact on operations if the hazard or hazardous event occurs
   c. Detectability – is a measure of the ability to detect presence of hazard or hazardous event

Description	Likelihood of Harad/Hazardous Even Occurring	Rating
Rare	May occur in exceptional circumstances, and has not occurred in past.	1
Unlikely	Could occur at some time, historically has occurred less than once every five (5) or ten (10) years.	2
Possible	Has occurred or may occur once or more per year.	3
Likely	Has occurred on a monthly to quarterly basis.	4
Very Likely	One (1) or more occurrences on a monthly or more frequent basis.	5

Description	Consequence of Hazard/Hazardous Event Occurring	Rating
Insignificant	Insignificant impact, little public exposure, little or no health risk.	1
Minor	Limited public exposure, minor health risk.	2
Moderate	Minor public exposure, health impact on small part of the population.	3
Major	Large part of population at risk.	4
Catastrophic	Major impact for large part of the population, complete failure of systems.	5

Description	Detectability of Hazard/Hazardous Event	Rating
Very Detectable	Easy to detect, on-line monitoring through SCADA.	1
Moderately Detectable	Moderately detectable, alarm present but not in SCADA, may require operator to walk by and notice alarm; problem is indicated promptly by in-house lab test results.	2
Normally Detectable	Normally detectable, visually detectable on rounds or through regular maintenance.	3
Poorly Detectable	Poorly detectable, visually detectable but not inspected on a regular basis; not normally detected before problem becomes evident, lab tests are not done on a regular basis (e.g. Quarterly).	4
Undetectable	Cannot be detected.	5

6. The reliability and redundancy of equipment shall be considered in this ranking.
7. The control measures, monitoring and response procedures shall be identified and considered when assigning rating to the hazards/hazardous events.
8. During the risk assessment process the following materials may be used to identify hazards/hazardous events within the DWS:
    a. Normal and abnormal activities
    b. Emergency situations
    c. Historical data
    d. Process flow diagrams
    e. Adverse conditions
    f. Maintenance process
    g. Available equipment
    h. Preventative maintenance schedule
    i. Records of accidents, spills, and any other upset conditions
    j. MECP Document “Potential Hazardous Events for Municipal Residential Drinking Water Systems” as updated from time to time.

9. The total risk shall be determined by adding the individual scores for the likelihood, consequence, and detectability, as defined in the table above.

    - **Likelihood + Consequence + Detectability = TOTAL Risk Rating**

Critical Control Points

10. All hazards/hazardous events which have an overall risk rating of nine (9) or greater shall be identified as a CCP on the Risk Assessment Outcomes table. At a minimum, the recommended CCPs required by regulation are to meet minimum treatment requirements outline in O.Reg.170/03.
11. The Risk Assessment Team may add or remove CCPs upon discussion, depending on level of control and internal decisions. These changes shall be noted in the 'Comments' column.
12. For each CCP, the following information shall be recorded on the Risk Assessment Outcomes table:
    a. Reference to monitoring measures to describe what is monitored to indicate that the process step is within specified CCL
    b. Reference to response procedures to describe the response to deviation from CCL
13. If the risk is not a CCP, a response procedure needs to be outlined in the 'Response Procedure to Non CCP' column.
14. The Risk Assessment process shall be completed at least once every thirty-six (36) months or whenever there is a change to the facility or process steps, the list of activities or process steps and potential hazards will be reviewed and updated accordingly.

Annual Review

15. The Director of Public Works, Foreman/ORO and QMS Representative shall review the Risk Assessment Outcomes table at least once every calendar year to ensure the assessment is complete and that the information and assumptions remain current and valid.

4. Related Documents

Drinking Water Quality Management Standard – Element 7

Drinking Water Quality Management Standard – Element 8

Millbrook Drinking Water System Risk Assessment Outcomes Table

8. Risk Assessment Outcomes

1. Purpose

The Operating Authority shall perform a risk assessment consistent with the documented process, and document:

- The identified potential hazardous events and associated hazards,
- The assessed risks associated with the occurrence of hazardous events,
- The ranked hazardous events,
- The identified control measures to address the potential hazards and hazardous events,
- The identified critical control points and their respective critical control limits (CCL's),
- Procedures and/or processes to monitor the CCL's,
- Procedures to respond to deviations from the CCL's, and
- Procedures for reporting and recording deviations from the CCL's

2. Procedure

QMS-07 Risk Assessment and Risk Assessment Outcomes table documents the hazard identification exercise conducted for the Millbrook Drinking Water System. All hazards were identified, assessed and ranked according to the procedure.

The Risk Assessment Outcome Table identifies the control measures in place to address potential hazards and hazardous events, identifies critical control points and their respective critical control limits along with the processes and/or procedures tin place to monitor critical control limits.

3. Related Documents

Drinking Water Quality Management Standard – Element 8

QMS -07 Risk Assessment

Millbrook Drinking Water System Risk Assessment Outcomes Table

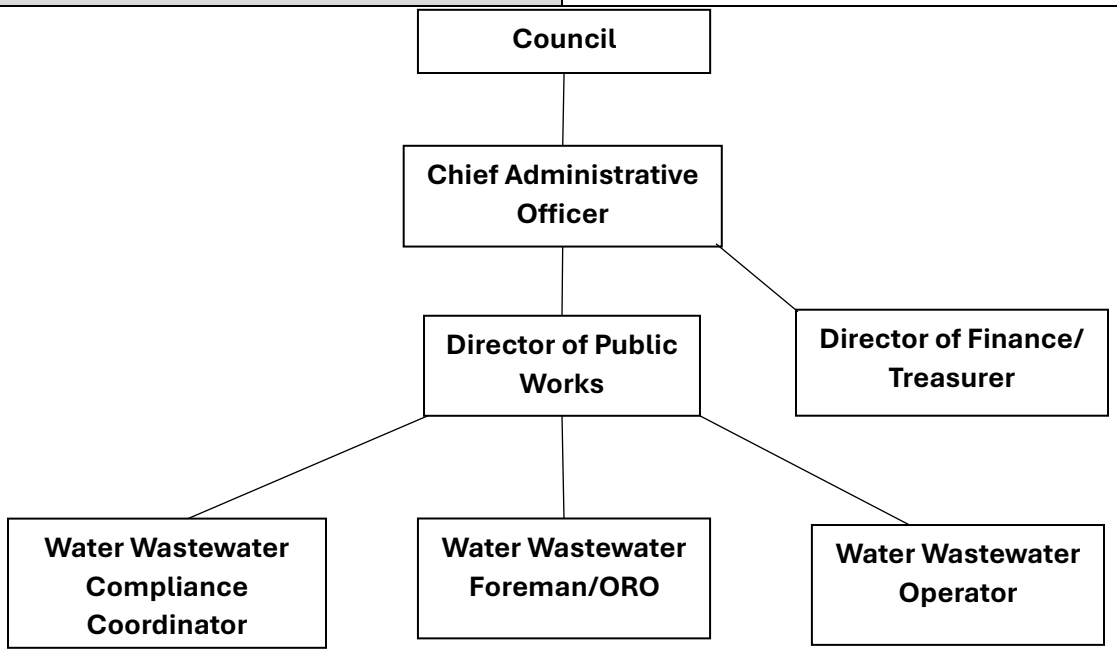
9. Organizational Structure, Role, Responsibilities and Authorities

1. Purpose

To document a procedure ensuring that the Owner, Operating Authority and Top Management are defined. The organizational structure of the Operating Authority is described as well as the roles, responsibilities and authorities of Top Management and key Positions within the Operating Authority.

2. Organizational Structure, Roles, Responsibilities and Authorities

Owner	Mayor and Members of the Township of Cavan Monaghan Council
Operating Authority	Public Works Department
Top Management	Chief Administrative Officer, Director of Public Works, Director of Finance/ Treasurer
QMS Representative	Water Wastewater Compliance Coordinator



Title	Responsibility	Authority
Mayor and Members of Council (Owner)	• Endorse and support the DWQMS Operational Plan and related documentation. • Provide resources and system infrastructure, as necessary, to provide safe drinking water in compliance with all applicable legislation. • Represent the drinking water system to the end users. • Prescribe requirements and monitor operations of the drinking water system to ensure safe clean drinking water is provided to all consumers.	• Provide and maintain financial integrity, accountability and transparency. • Ensure competent personnel manage the drinking water system.

Chief Administrative Officer (Top Management)	• Endorse and support the DWQMS Operational Plan and related documentation. • Ensuring the QMS is implemented and maintained, and the Operating Authority is accredited. • Leadership and general management of the Township, acting as key advisor and liaison to Council. • Ensure competent Management is in place to run and oversee the system. • Obtaining resources or infrastructure as necessary from the Owner. • Owner representative during emergency situations. • Lead for providing information to the public and media, if required, during emergency situation. • Required to perform the management review and attend Management Review meetings	• Recommend and/or implement improvements/changes to the drinking water system. • Designate responsibilities as appropriate. • Designated signing authority for the Township.
Director of Public Works (Top Management)	• Endorse and support the DWQMS Operational Plan and related documentation. • Overall responsibility for the Public Works Department. • Reporting the DWS performance and operations status to the Owner. • Obtain resources or infrastructure as necessary. • Leads general and financial management of the Public Works Department. • Assess road, water, wastewater, environmental, and transportation infrastructure needs. • Oversees preparation of and recommends annual operating and capital budgets. • Communicate emergencies to CAO as required. • Overall responsibility for staff safety. • Lead for managing emergencies. • Required to perform the management review and attend Management Review meetings.	• Designate responsibilities as appropriate. • Allocation of resources provided • Approval of hiring all personnel staff for the Public Works Department. • Approve and implement standard operating procedures, policies and related documentation within the department.

	• Alternate QMS Representative.	
Director of Finance/ Treasurer (Top Management)	• Endorse and support the DWQMS Operational Plan and related documentation. • Review annual operating and capital budgets. • Provide guidance with the Water Wastewater Rates Study and Financial Plan. • Required to perform the management review and attend Management Review meetings	• Provide and maintain financial integrity, accountability and transparency. • Designated signing authority for the Township.
Water Wastewater Compliance Coordinator (QMS Representative)	• Development of drinking water operational plans and procedures. • Update and maintain Operational Plan. • Maintain regulatory compliance within the Public Works Department. • Budget development for the DWS. • Training and development of staff. • Complete Internal Audit process. • Annual Risk Assessment procedure review • Appointed QMS Representative by Top Management. • Develop, implement, and maintain the QMS in accordance with the DWQMS. • Report on the effectiveness of the QMS to Top Management. • Promote the QMS throughout the DWS. • Chair the Management Review meetings. • Maintaining compliance in the DWS. • Complete regulatory reporting under the SDWA and all other applicable legislation/ regulations.	• Reporting any adverse water quality incidents to regulatory agencies, and Top Management. • Development and implement policies and procedures. • To perform all defined responsibilities in the QMS. • Chair the Management Review meetings.
Water Wastewater Foreman/ORO	• Designated Overall Responsible Operator (ORO) for the Township's DWS. • Schedule work assignments. • Ensure water quality and quantity to consumers. • Monitor water quality and demand. • Supervision of operations and maintenance staff.	• Designate responsibilities as required.

	• Coordinates and directs the day-to-day operations and maintenance of the drinking water system. • Maintain operational parameters of the DWS.	
Water Wastewater Operator	• Perform specified duties as directed as per training and/or directed by superiors. • Maintain operational parameters of the DWS. • Maintain or repair machinery and equipment where qualified. • Designated operator in charge (OIC) where appropriate. • Follows duties as assigned in the QMS. • Maintain operator's license and training as per MECP requirements. • Report and act upon nonconformance's and corrective actions. • To perform response and recovery activities as directed. • Alternate ORO as assigned by the Foreman.	• Operate and maintain the DWS under direction of the Director of Public Works and the Water Wastewater Foreman/ORO. • Identify problems within the DWS. • To perform all defined responsibilities in the QMS.

10. Competencies

1. Purpose

To describe the competencies of personnel whose job activities directly affect drinking water quality.

2. Procedure

The following table lists the required competencies for trained staff whose performance will have a direct impact on drinking water quality.

Position	Required Competency
Water Wastewater Compliance Coordinator	• Advanced knowledge of the DWQMS standards, procedures, and documentation • Advanced knowledge of water regulations • Minimum OIT level water distribution and supply certificate, backup operator • Valid Driver's License
Water Wastewater Foreman/ORO	• Minimum Class II water distribution and supply certificate

	• An understanding of the DWQMS, water treatment and distribution processes, SCADA systems, water regulations • Supervisory experience • Thorough knowledge of emergency procedures and workplace safety • Valid Driver's License
Water Wastewater Operator	• Minimum OIT level water distribution and supply certificate, working towards a Class II water distribution and supply certificate • An understanding of the DWQMS, water treatment process, SCADA systems, water regulations • Valid Driver's License • Alternate ORO
Director of Public Works	• Advanced written and verbal communications • Supervisory, scheduling, planning skills • Experience in budget preparation / analysis • Thorough knowledge of emergency procedures and workplace safety • Thorough understanding of the DWQMS, water treatment process, SCADA systems, water regulations

3. Meeting and Maintaining Competencies

The competency requirements identified in the above table are developed, maintained, and confirmed by the following:

- Candidates considered for hire must present proof of relevant education, licensing and required competencies through the Township's Human Resources third party contractor.
- New employees undergo comprehensive on-the-job training by experienced staff.
- All employees receive training in such topics as safety, processes operations, regulatory requirements, equipment operation, new treatment technologies and DWQMS procedures.
- Training is provided using a variety of methods including experienced in-house staff, technical experts, or contracted professional trainers
- All training records are kept on the server.
- Operator licensing renewal requirements are tracked to ensure their validity.

- Water Wastewater operations employees are trained to recognize the importance of their duties and how they affect safe drinking water. Continual improvement and due diligence are emphasized.

4. Related Documents

Drinking Water Quality Management Standard – Element 10

11. Personnel Coverage

1. Purpose

To ensure the continuous coverage and availability of personnel for the Millbrook Water System to address all issues that directly affect drinking water quality.

2. Personnel Coverage During Normal Working Hours

Staff coverage is aligned with the requirements of the Safe Drinking Water Act, 2002, 0. Reg 128/04 Certification of Drinking Water System Operators and Water Quality Analysts and O Reg. 170/03 Drinking Water Systems.

The Millbrook Drinking Water System is a Class II Water Distribution and Supply system, and therefore the overall responsible operator (ORO) must also hold a minimum Class II Certificate or higher. An operator with a certificate one class lower than the class of the system may assume the ORO responsibility for up to 150 days a year as a back-up when the ORO with the required qualifications is absent or unable to act. If required, a third-party ORO may be contracted.

The ORO must always be available by phone.

Regular hours are 7:00am-5:00pm Monday - Friday. There is a minimum of one operator designated to the water system at any given time.

3. Afterhours, Weekends and Holidays

Operators with Operator-in-Training (OIT) Water Distribution and Supply licenses are on a rotating on-call schedule to cover after hours, weekends and holidays. All on-call operators will carry a Township provided cell phone. The schedule will be determined by the Director of Public Works. If the on-call operator requires regulatory or technical support they are to call the ORO.

4. Callout Sequence and Back-up Plan

After-hours calls are fielded by an answering service and sent to the appropriate on-call operator. If the on-call operator cannot be reached, a call will be made to staff in the following order:

a. ORO, if not the operator on call
b. DWQMS Representative

c. Director of Public Works

5. Staff Shortages

In the event of a staff shortage due to unforeseen circumstances, other staff with the proper level of certification may operate the water system. In certain Emergency Situations, certain people not holding an applicable operators certificate may be able to temporarily operate the system as outlines in O.Reg 128/04 Section 13.

6. Related Documents

Drinking Water Management Standard – Element 11

12. Communications

1. Purpose

The purpose of this procedure is to identify the method for communicating the Quality Management System to all stakeholders.

2. Procedure

Internal Communications

Information related to the DWS is communicated using several methods, including:

- Physical logbooks
- Staff meetings and training sessions
- Emails

Information that is communicated internally may include, but is not limited to:

- Emerging and existing regulations and legal requirements
- Original and new versions of policies, procedures, or other instructional documents
- Equipment installations or replacement
- Process changes

External Communications

There are a variety of methods used to communicate drinking water information to customers.

- Utilizing the platforms and procedures outline in the Township's Communications Policy.
- In person door-to-door communications regarding water service disruptions and other distribution system maintenance.
- Printed and/or digital information may be included with customer water and sewer bills.

- Annual reports containing summaries of drinking water system description, condition, and performance are available on website and upon request
- Current water quality results are available upon request from the Township.

Customer Complaints

- Customers can contact staff directly with any concerns or complaints about the system. Staff contact information is available on the Township website under the Water and Wastewater Services Page.
- Complaints received by staff via website, phone or email are communicated to the Water Wastewater Foreman or alternate.
- After-hours calls are received by the Township's contracted answering service and forwarded to the on-call operator.
- All customer complaints are recorded in the Water and Wastewater Customer Complaint log located on the shared server.

Communication to Owner

- The QMS representative shall provide the owner with a current copy of the Operational Plan to ensure the Owner's endorsement and approval of the Operational Plan.
- The QMS rep can make minor administrative changes to the Operational Plan without requiring re-endorsement by the Owner and Top Management. It is recommended to re-endorse by council and Top Management after a significant change to the Operational Plan.
- The QMS rep shall keep the Owner informed of any major changes to the QMS, the adequacy of infrastructure requirements, internal and external audit results, the outcome of on-going activities as a result of Management review and any other issues pertaining to the QMS.
- Meeting minutes will be maintained by the QMS rep and filed in accordance with the Document and Records Control procedure.
- The QMS rep will provide updates on the QMS through the Drinking Water System Summary Report and Annual Report, which is presented to the Owner every year prior to the annual March 31th deadline as stated in Ontario Regulation 170/03.

Communication to Suppliers

- The quality, legislative requirements and standards for essential supplies are communicated to all suppliers and service providers through the purchasing process (request for tenders, proposals, etc.)

3. Related Documents

Drinking Water Quality Management Standard – Element 12

Township's Communications Policy

13. Essential Supplies and Services

1. Purpose

This procedure will ensure that all suppliers and service providers used by the Township of Cavan Monaghan for the Millbrook Water System meet all quality and regulatory requirements to provide safe and reliable drinking water for all customers.

2. Essential Supplies and Services

The information related to the essential suppliers and service providers is reviewed annually as part of the Operational Plan review. This ensures that information is current and that any updates to the essential supplies and services plan are communicated to appropriate personnel.

All process chemicals must meet applicable NSF, AWWA and ANSI standards. Proof of chemical products must be provided to the operator upon delivery.

All testing conducted at laboratories must be done at laboratories that are accredited to ISO17025 standards.

Staff verify on an on-going basis that product shipments meet the quality requirements. When deliveries from suppliers are non-conforming, they are not accepted and returned to supplier.

The following table lists some of the essential supplies and services along with quality requirements.

Essential Supply or Service	Method for Procurement	Quality Requirements
Laboratory Services	• Sample containers and chain of custody (C of C) provided by the lab • Water samples taken by operator with completed C of C • Results provided to Township	• Lab accredited to ISO 17025 and licenses by MECP
Parts and Equipment	• Rental, back-up and replacement equipment and parts	• Township staff confirms quality prior to receiving delivery • NSF 61 Certification • Packing slips confirming products delivered meet requirements

Treatment Chemicals	• Minimum quantity of chemicals at all times • Delivery schedule set and agreed to by supplier and Township • Proper delivery and transport following all health and safety protocols Certificate of Analysis (c of A)	• C of A confirming chemical composition and concentration • NSF 60 certification • Operator verifies conformity prior to receiving chemicals
Calibration Services	• Scheduled annually	• Authorized to service manufacturer's equipment • Certificate of calibration/service provided

3. Related documents

Drinking Water Management Standard – Element 13

Essential Supplier List

14. Review and Provision of Infrastructure

1. Purpose

The Operational Plan shall document a procedure for reviewing the adequacy of the infrastructure necessary to operate and maintain the System that:

- Considered the outcomes of the risk assessment documented under Element 8, and
- Ensures that the adequacy of the infrastructure necessary to operate and maintain the System is reviewed at least once every calendar year.

The Operating Authority shall implement and conform to the procedure and communicate the findings of the review to the Owner. This procedure also describes how the findings of the review are communicated to the owner.

2. Procedure

Review of Infrastructure Needs

1. Watermain lifecycle activities that include installation, maintenance, rehabilitation, reconstruction and abandonment are developed as part of the Asset Management Plan. A number of variables such as watermain breaks, consumer inquiries, water quality trends and age of infrastructure are taken into consideration of the plan.
2. An infrastructure review is taken into consideration in coordination with other assets to maximize cross asset integration opportunities that incorporate other parameters outside of the drinking water system such as road and sewer.

3. At least once every calendar year a documented review will be held by the Director of Public Works (at a minimum) to ensure the adequacy of the infrastructure necessary to operate and maintain the drinking water system. This review includes consideration of the outcomes of the risk assessment documented in QMS-08 – Risk Assessment Outcomes.
4. During preparation of the upcoming budget approval process, costs and benefits are weighed to best determine which infrastructure projects take priority.
5. The replacement recommendations are then used to adjust the Water Wastewater Department's capital plan (replacement forecast) and subsequently the proposed annual operating and capital budget.
6. The capital and operating budgets are provided to the Owner for approval, removal, or adjustment.
7. The capital plan (replacement forecast) is maintained dependent on the budget approval projects that are selected.
8. Operating budgets are based on maintenance, operations and compliance issues that may result from maintenance performed and maintenance planned, MECP inspection results, staff suggestions, consultant report recommendations, and considers the outcomes of the risk assessment documented in QMS-08 – Risk Assessment Outcomes.

New Infrastructure

9. New infrastructure must meet the current design standards while maintaining the minimum level of requirements set out in the Municipal Drinking Water License and Drinking Water Works Permit.
10. The results of the growth related drinking water infrastructure needs review are documented in the following:
    a. Official Plan (OP)
    b. Growth Management Plan (GMP)
    c. Master Servicing Study (MSS)
    d. Development Charges Study (DC Study)
11. Long term planning for growth related infrastructure starts with development and updating of the OP, which provides the policy framework to guide the provision of infrastructure within Millbrook. The OP focuses on population projections, land use and infrastructure development policies.
12. The MSS was completed in order to determine the specific needs and timing for drinking water infrastructure to supply the specific serviced area (Millbrook).

13. The development of the OP and MSS provides an opportunity for projections over new development projects.

Provision of Infrastructure

14. The Public Works Department, including the Water and Wastewater Department, develops a list of priority projects that is needed to maintain the drinking water system based on the review of infrastructure, other infrastructure projects, and considers the risk assessment as documented in the QMS-08- Risk Assessment Outcomes. The projects are documented through the Asset Management Plan, and the Long-Term Forecast of Major Infrastructure Maintenance, Rehabilitation, and Renewal.
15. The Director of Public Works takes the list of priority projects, applies detailed costs to the projects, and then carries the list forward through the capital works budget process.
16. Annual operating budgets are also used to provide infrastructure needs and maintenance. Budgets can be increased if new initiatives occur.

Communication to the Owner

17. The required maintenance, rehabilitation and renewal of work are communicated to Council annually through the budgetary process. The operating and capital budgets are the primary means of communication between the Water Wastewater Department and the Owner concerning the findings from the review of the infrastructure needs. The proposed budgets will be provided to Council for approval as per the municipal budgeting process.

3. Related Documents

Drinking Water Quality Management Standard – Element 14

15. Infrastructure Maintenance Rehabilitation and Renewal

1. Purpose

To document a procedure for infrastructure maintenance, rehabilitation and renewal programs for the DWS. This procedure is a continuation from the review and provision of infrastructure procedure and is a summary of the infrastructure rehabilitation, renewal, and maintenance programs and activities that are undertaken.

2. Procedure

Infrastructure Maintenance Program

The Director of Public Works develops and trends maintenance programs to ensure the functionality of the infrastructure in the distribution and water treatment systems. The program includes both planned and unplanned maintenance. For planned maintenance, a long-term forecast of necessary activities is maintained.

1. Distribution Valve Maintenance
    a. The distribution valve maintenance is completed annually in the summer or fall months on a 3-year rotation. The Operator will copy the system map page and identify which valves were exercised and any repairs required. Once complete, all information is transferred to the Valve Maintenance logbook.
2. Hydrant Maintenance
    a. Hydrant maintenance is completed at a minimum once annually. Records of maintenance are maintained in the Hydrant Maintenance Logbook.
3. Dead End Flushing
    a. Dead end flushing is performed in the spring and fall each year. Additional flushing of hydrants may be completed as required. Records of flushing are maintained in the Hydrant Flushing Logbook.
4. Water Treatment Plant Maintenance
    a. Maintenance is scheduled either based on time elapsed or hours of use. The following is a list of the equipment maintenance programs at the WTP:
        i. Valve maintenance - annually
        ii. Standpipe maintenance - every 5 years
        iii. Booster pumping station - as required
        iv. Flow meters and on-line monitors - as required, at minimum annually
        v. Backup generators – monthly
5. Unplanned Maintenance
    a. Water main breaks, leaking service or broken water service are all examples of unplanned maintenance in the water distribution system. A customer complaint will be handled following procedure in QMS-12 Section 5. Any action taken is recorded in the appropriate Logbook. After normal working hours, Operators that are on call are called by the contracted answering service.

Program Effectiveness and Communication

The maintenance program effectiveness is captured annually during the Management Review Process.

3. Related Documents

Drinking Water Quality Management Standard – Element 15

Long-Term Forecast of Major Infrastructure Maintenance, Rehabilitation, and Renewal.

16. Sampling, Testing and Monitoring

1. Purpose

The purpose of this procedure is to ensure that sampling, testing, and monitoring conducted for the Millbrook Drinking Water System is performed in a manner that meets and/or exceeds regulatory requirements.

2. Sampling, Testing and Monitoring

Sampling and analysis of the drinking water falls under two categories:

a. Regulatory Sampling
b. Operational or process monitoring and control

All sampling programs, including frequency, sampling, testing, and monitoring meet the requirements of the SDWA. All samples collected under O.Reg 170/03 shall only be analyzed by an accredited laboratory. Approved laboratories are found in the list of Essential Suppliers and Services found within the Emergency and Contingency List. regulatory drinking water testing must be performed by a laboratory that is licensed by the MECP. The water quality sampling program is to be reviewed on an annual basis to ensure the legally required number of samples are being taken based on population.

3. Sampling Protocol

a. All samples collected within the DWS are to be collected by a Township operator or a Township approved qualified professional.
b. Samples for Treated Water are to be taken from the point at which water enters the drinking water system's distribution system following full treatment.
c. Samples for Raw Water are to be taken from a point prior to the addition of chlorine.
d. Bacteriological sampling, including chlorine residuals, are completed weekly throughout the distribution system by the Township’s operators. Locations are outlined in the table below.
e. All samples taken for laboratory analysis are grab samples.
f. Each sample taken for microbiological analysis, another sample must be taken at the same time and location immediately and tested for free residual chlorine.
g. When samples are taken, the following information must be recorded on the Chain of Custody form: date, time, location, name of sampler.

h. If an on-site operational check is performed, this result is also to be recorded on the form.

i. All instructions provided by the laboratory must be followed for sampling, storage, preservation, and transportation. These instructions follow the MECP protocol titled "Practices for the Collection and Handling of Drinking Water Samples".

j. All tests that are recorded by continuous monitoring equipment must be examined by a certified operator within 72 hours after the tests are conducted.

Sampling Frequency

Location	Regulatory Testing	Operational Testing
Raw Well • Well 1 • Well 2 • Well 3	Weekly • Total Coliforms • E. coli • Heterotrophic Plate Count	Weekly • Turbidity
Treated Water	Continuous • Free Choline Weekly • Total Coliforms • E. coli • Heterotrophic Plate Count Quarterly • Nitrite • Nitrate • THM • HAA Annually • Sodium • Schedule 23 Reg 170/03 • Schedule 24 Reg 170/03 Every 5 years • Floride	Continuous • Turbidity
Distribution System • Tupper St • Huston St • Brookside St • Gravel Rd	Weekly • Total Coliforms • E. coli • Heterotrophic Plate Count	Weekly • Free chlorine

Monitoring

The Millbrook DWS is operated by a supervisory control and data acquisition (SCADA) system. This system will instantaneously send an alarm to notify the on-call operator of any occurrences requiring attention.

Challenging Conditions

Increased water quality sampling and/or testing may occur during times of adverse conditions (i.e., during corrective actions associated with adverse test results) or during periods which may increase risks to the drinking water system (i.e., during system repairs). Additional sampling and testing in these conditions may include sampling for microbiological parameters or conducting field tests for free chloring residual, pH and/or turbidity.

When and existing watermain has been repaired, operators shall complete sampling, testing and monitoring to the discretion of the ORO.

Adverse Sample Results

The licensed laboratory that is contracted to provide testing shall provide immediate verbal notification to the Township in the event of an adverse test result. The Township then provides immediate verbal notification to Peterborough Public Health, the MECP Spills Action Centre and the owner.

Sampling of New Watermains

Operators or approved qualified professionals conduct all the sampling of new watermains within Millbrook. All samples will be collected as per O.Reg 170/03 and are collected after the watermain has been cleaned and disinfected as outlined in the Watermain Disinfection Procedure published by the MECP.

Records

All laboratory results are sent directly from the lab to the Township and stored electronically. Free residual chlorine, pH alkalinity, turbidity and /or temperature test results may be recorded in logbooks, within lab results or on Chains of Custody. Sampling, testing, and monitoring results are reviewed regularly by Management and communicated with the Owner through regular quarterly updates as well as the Annual Report for the drinking water system. All sampling and testing records are managed in accordance with QMS-05 – Document and Record Control.

4. Related Documents

Drinking Water Management Standard - Element 16

SOP- 001 Adverse Water Quality

17. Measurement and Recording Equipment Calibration and Maintenance

1. Purpose

To ensure the calibration and maintenance of measurement and recording equipment. Measuring accuracy of this equipment is essential to provide quality drinking water to consumers while meeting or exceeding regulatory requirements.

2. Scope

This procedure is applicable to measuring and recording equipment used at the Millbrook drinking water system. This procedure covers the following equipment:

- Flow meters
- Level Transmitters
- On-line Chlorine residual analyzer
- On-line turbidimeter
- Portable colorimeter
- Portable turbidimeter

3. Responsibilities

The QMS Representative is responsible for creating and maintaining the verification, calibration, and maintenance schedule. Staff with the appropriate license are responsible for performing routine maintenance and calibration. Certified technicians shall be used for certain annual calibrations and for non-routine repairs. All maintenance and calibrations performed are recorded in the appropriate logbook.

4. Procedure

The frequency of calibration shall be at least that which is required by 0. Reg 170/03 or suggested by the manufacturer, whichever is most frequent. If monitoring equipment is dropped or damaged, the equipment shall be verified and/or calibrated and repaired if required before being put back into service.

All calibration and maintenance shall be performed according to manufacturer's instructions and shall be recorded in the applicable logbook.

List of equipment

Monitoring Parameter and Location	Equipment	Calibrations Schedule	Calibration Technician	Calibration Method
Free Chlorine Residual x2 Pumphouse	On-line	Daily Annually	Operator Certified Technician	Comparative
Turbidity Pumphouse	On-line	Annually	Certified Technician	
Flow Well 1 Well 2 Well 3	Magnetic Flow Meter	Annually	Certified Technician	
Flow Pumphouse	Flow Meter	Annually	Certified Technician	
Free Chlorine Residual Distribution System	Portable Colorimeter	Monthly	Operator	Comparative
pH	Portable pH Meter	Daily	Operator	According to manufacturer directions
Turbidity	Portable Turbidimeter	Monthly	Operator	Comparative

5. Related Documents

Drinking Water Management Standard - Element 17

Associated equipment manuals

SOP-009: Calibration and Verification of Monitoring Equipment

18. Emergency Management

1. Purpose

To document a procedure to maintain a state of emergency preparedness, including:

- A list of potential emergency situations or service interruptions
- A process for emergency response and recovery
- Emergency response training and testing requirements

- Owner and Operating Authority responsibilities during emergency situations
- References to municipal emergency planning measures
- An emergency communication protocol and an up-to-date list of emergency contacts.

This procedure shall include all potential emergency situations or service interruptions for the DWS.

Should a drinking water-related emergency go beyond the scope of this procedure, the Township of Cavan Monaghan Emergency Response Plan shall take precedence.

2. Procedure

1. The Risk Assessment Procedure shall be used for identifying potential emergency situations that may arise.
2. Sources of information for identifying potential emergencies may include but are not limited to:
   - MECP inspections
   - DWQMS Internal/External Audits
   - Records of past emergencies
   - Health and Safety reviews
   - Operator observations

Potential Emergencies

3. The ability to respond rapidly and correctly in the event of an emergency will assist in protecting users of the system, prevent additional complications, and reduce costs. Both the Director of Public Works and the Water & Wastewater Compliance Coordinator shall have certification in basic emergency management training.

Potential Emergency or Service Interruptions
Loss of raw water supply
Fire at Water Treatment Plant
Loss of essential supply
Terrorism, vandalism, security of infrastructure (cybersecurity)
Pandemic of staff shortage
Severe Storm
SCADA and communication failure
Loss of power, generator failure (extended)
Low pressure in distribution system
Adverse water quality advisory
Flood
Drought

Well pump failure
Improper disinfection
Major/minor watermain break
Loss of standpipe supply

Response and contingencies to all the above-mentioned potential emergency or service interruptions may be referenced or found within the Risk Assessment Outcomes table.

Emergency Response and Recovery

4. Overall emergency response and recovery shall be the responsibility of the ORO. The Owner shall be notified in the event that water quality poses a health risk to consumers and a boil/drinking water advisory of drinking water must be issued.
5. The ORO shall communicate all adverse water quality event(s)/result(s) to the Director of Public Works and the CAO (Top Management) by email indicating the nature of the event and corrective action(s) taken. Within a twenty-four (24) hour period or when reasonably possible, both the Director of Public Works and CAO (Top Management) shall respond to the ORO confirming that they have received the notification of adverse water quality. All sampling, testing and monitoring results are available to the Owner upon request at the Municipal Office.

Township of Cavan Monaghan Emergency Response Plan:

6. The Township emergency plan takes effect when the emergency is defined as situations or the threat of impending situations abnormally affecting property and the health, safety and welfare of a community, which by their nature or magnitude require a controlled and coordinated response by a number of agencies under the direction of the Municipal Control Group. These are distinct from normal, day-to-day operations carried out by the first response agencies or municipal agencies.

Emergency Contacts

7. The Emergency and Contingency Phone Number list can be found electronically on the Township's shared drive and a hard copy can be found in the Public Works Department.
8. A copy of The Cavan Monaghan's Emergency Response Plan can be found on the shared drive or a hard copy at the Municipal Office.

Responsibilities During Emergencies

Below illustrates the responsibilities of each position during emergencies within the drinking water system:

Title	Responsibilities
Chief Administrative Officer	• Owner representative during emergency situations. • Chief liaison between operating authority and the Owner • (Council) • The lead for providing information to the public and media if required.
Director of Public Works	• Communicate emergencies to the Town Manager as required. • Overall safety of staff. • Lead for managing the emergency.
Water Wastewater Compliance Coordinator	• Ensure water quality and quantity to consumers. • Communicate emergencies to Top Management when required.
Water Wastewater Foreman/ORO	• ORO of the DWS. • Communicate emergencies to Top Management when required.
Water Wastewater Operator	• To perform response and recovery activities as directed.

Emergency Response Training

9. All Public Works staff shall receive emergency training on potential emergencies or service interruptions annually. This training shall include but not limited to:
    a. A review and discussion of emergencies that occurred since the previous training.
    b. A review of the Emergency Management Procedure.
10. Any recommended revisions to the Emergency Management Procedure or emergency response procedures shall be completed as per the Document Control Procedure.

11. Debriefing shall occur after every emergency or service interruption and recorded through meeting minutes.

Emergency Response Testing

12. At a minimum, at least one (1) emergency response procedure related to potential emergencies or service interruption identified in the table above, shall be tested with staff annually. Testing may be either practical or a table-top exercise. This testing shall be managed, arranged, and recorded. The validity of the emergency response procedure shall be tested by discussing the emergencies that have occurred since the previous training.

Municipal Emergency

13. In the event of a Municipal Emergency, all planning measures, communication protocols, roles and responsibilities and a list of emergency contacts can be found within the Township of Cavan Monaghan Emergency Response Plan. The Emergency Response Plan is found electronically on the shared drive or hardcopy at the Municipal Office.

19. Internal Audit

1. Purpose

This procedure describes the internal audit process to ensure conformity with the DWQMS and to improve the suitability, adequacy, and effectiveness of the QMS. The procedure will document a procedure that:

a. Evaluates conformity of the Quality Management System with the requirements of the DWQMS,
b. Identifies internal audit criteria, frequency, scope, methodology and record-keeping requirements,
c. Considers previous internal and external audit results, and
d. Describes how quality management system corrective actions are identified and initiated.

2. Procedure

Roles and Responsibilities

The QMS Representative is responsible for selecting the audit lead. The Auditor must have completed an applicable Internal Audit Training Course to be qualified to conduct the Internal Audit.

Alternately, an Auditor may be sourced from an internal personal, or different municipality, consultant, etc., if evidence of their qualifications is made available to the QMS Representative.

Audit Frequency

Each section of the DWQMS Operational Plan shall be audited according to the process audit plan. By following this plan, all elements will be audited at least once in a three-year cycle.

The Auditor shall notify the appropriate drinking water system personnel at least one week prior to the audit.

Audit Preparation

The Auditor will prepare an internal audit schedule and assign processes to be audited to team members. The internal audit checklist will be prepared after reviewing the most recent version of the DWQMS Operation Plan.

The checklist shall be used by the Auditor as a guideline for conducting interviews and document review during the audit.

The Auditor shall also reviews any findings from previous Internal audits or Third-party audits.

The Auditor shall obtain evidence of compliance with the Operational Plan, applicable SOP’s and with the DWQMS. All evidence shall be documented on the checklists.

Conducting the Audit

The audit shall determine conformance to procedures and to the DWQMS by conducting interviews and reviewing documentation.

Documentation to be reviewed includes the Operational Plan, SOP's, and logbooks.

Any findings found during the audit shall be communicated verbally to the Director of Public Works or employee before the end of the audit.

Reporting the Audit Results

The Auditor submits a complete written report to Top Management. The findings shall be categorized as:

a. Non-conformance-discrepancy between the QMS and the DWQMS or between the QMS and how it is implemented in the system.
b. Positive findings
c. Opportunities for improvement

The audit report should include references to procedures; previous audit findings and documents reviewed during the audit.

Corrective or preventive actions shall be issued by the auditor according to Element 21 of the Operational Plan.

The audit report shall contain a statement about the overall compliance to the Operational Plan, effectiveness of implementations and be distributed to Top Management for review.

Post Audit Activities

Any non-conformances found during the audit shall be followed up through the Continual Improvement Procedure contained in Element 21 of the Operational Plan.

Copies of the audit report, checklist and corrective actions shall be maintained by the QMS Representative.

3. Related Documents

Drinking Water Quality Management Standard – Element 19

Internal Audit Checklist – Elemental

Internal Audit Checklist – Process

Process Audit Plan

20. Management Review

1. Purpose

This procedure defines the process for the review of the effectiveness of the QMS. Management reviews are conducted to assess and ensure the continuing suitability, adequacy, and effectiveness of the QMS.

2. Procedure

1. The Management Review shall be conducted at least once every calendar year. Following completion and documentation of the internal audit and prior to the next scheduled third-party audit.
2. Management reviews shall be conducted through a meeting with the following participants at a minimum:
    a. CAO (Top Management)
    b. Director of Public Works (Top Management)
    c. Director of Finance/Treasurer (Top Management)
    d. QMS Representative

3. At least a week prior to the Management Review meeting, the QMS Representative shall provide a meeting agenda with the topics to be reviewed to all management review meeting attendees. Topics include the following:

    a. Incidents of regulatory non-compliance
    b. Incidents of adverse drinking-water tests
    c. Deviations from critical control-point limits and response actions
    d. The efficacy of the risk assessment process
    e. Internal and third-party audit results
    f. Results of emergency response testing
    g. Operational performance
    h. Raw water supply and drinking water quality trends
    i. Follow-up on action items from previous management reviews
    j. The status of management action items identified between reviews
    k. Changes that could affect the QMS
    l. Consumer feedback
    m. The resources needed to maintain the QMS
    n. The results of the infrastructure review
    o. Operational plan currency, content and updates
    p. Staff suggestions

4. After review of the information presented, the management review participants shall identify any deficiencies related to the effectiveness of the QMS and its procedures, implementation of the QMS, provision of adequate resources, and consumer's satisfaction level.
5. Management review participants shall identify action items for all deficiencies identified, timelines and responsible personnel for action items shall be determined.
6. Records of management reviews, suggestions, deficiencies, timelines and personnel responsibilities of action items shall be forwarded to the Management Review participants when completed.
7. The results of the management review, including deficiencies, decisions, and action items will be summarized into a memo which will be provided to the owner(s).
8. The QMS Representative shall retain records of the management review as per the QMS – 05 Document and Record Control procedure.

3. Related Documents

Drinking Water Quality Management Standard – Element 20

21. Continual Improvement

1. Purpose

The purpose of this procedure is to describe the system used to continually improve the effectiveness of the Quality Management System by processes identified by preventative and corrective actions.

2. Procedure

1. Continual improvement opportunities may be the result of employee suggestions or ideas, internal/external audits, preventative actions, corrective actions, preventative maintenance activities, management and infrastructure reviews, customer comments, changes in process technology, best management practices, and Owner input.
2. Applicable Best Management practices (including any published by the MECP) will be reviewed and considered at least once every thirty-six (36) months. The following personnel will take part in the review at a minimum:
    a. Director of Public Works
    b. Operation Foreman/ORO
    c. QMS Representative
3. The review of the applicable Best Management practices will be undertaken during the thirty-six (36) month Risk Assessment.

Employees may submit suggestions and ideas to the QMS Representative through email, during scheduled meetings or internal training sessions. These suggestions shall be recorded in meeting minutes.

Each suggestion or idea (which may also be considered as Preventive Actions) will be reviewed for its value adding applicability. Those that are initially accepted will be divided into one of three categories:

a. Process improvement opportunity
b. Infrastructure improvement opportunity
c. QMS improvement opportunity

4. Each accepted suggestion or idea will then be assigned to a responsible designate (may or may not be the original suggestion or idea provider). The responsible designate shall provide, in written format to the QMS Representative:
    a. Describe the process, QMS and/or infrastructure improvement opportunity
    b. Estimate the cost associated with the improvement

c. Provide a basic project timeline for the implementation and verification of the effectiveness of the implementation

5. The QMS Representative shall, along with the responsible designate, present the opportunity to the Director of Public Works for approval. The presentation may be in the form of a discussion, or a more formal presentation method. The information generated in the above-mentioned steps of this procedure shall form the basis of the presentation.
6. Process improvement ideas, if accepted by the Director of Public Works, shall be implemented and verified as per the timeline provided.
7. Infrastructure improvement ideas, if accepted by the Director, shall be raised during the review and provision of infrastructure. If however, the suggestion or idea merits more immediate consideration, the Director may choose to immediately approve the Improvement Opportunity if within budgetary, operational and contract boundaries.
8. The QMS Representative shall keep track of all Continual Improvement opportunities.
9. The Continual Improvement opportunity shall be part of the audit within 12 months of implementation to determine its overall effectiveness.
10. Handling nonconformities and taking corrective or preventive action involve identifying root causes and taking measures to eliminate causes of identified nonconformances of the QMS. Corrective action may be initiated because of the following indicators:

    a. Internal and external audits
    b. Management reviews, infrastructure reviews and risk assessment reviews
    c. Customer complaints
    d. Staff suggestions
    e. Regulatory inspection results
    f. Unexpected problems or issues

Any employee can initiate corrective actions by informing the QMS Representative, who will then issue a Continual Improvement Form. This form will identify:

a. Corrective immediate short-term action to be taken
b. Root cause of identified non-conformity
c. Actions taken to correct the non-conformity and prevent the non-conformity from re-occurring
d. Description of follow-up

All corrective actions taken to correct non-conformities will be documented in the Continual Improvement Form and reviewed at the annual Management Review Meeting.

3. Related Documents

Drinking Water Quality Management Standard – Element 21

Continual Improvement Form