City of Waterloo
IPPW, City Utilities

DWQMS Operational Plan
Water Distribution System

Effective Date: July 21, 2025

Rev. 19

DWQMS Operational Plan

Table of Contents

DWQMS Operational Plan

Introduction

Following the 2000 Walkerton drinking water tragedy, Part 2 of the Walkerton Inquiry resulted in 93 recommendations by Justice O'Conner to ensure the safety of drinking water. Recommendation 71 states that the Ministry of Environment, Conservation and Parks require owners of municipal water systems to obtain a licence for the operation of the drinking water system. To obtain a licence, the owner must have the following components:

1. Drinking Water Works Permit
2. Financial Plan
3. Accreditation
4. Operational Plan
5. Permit to Take Water

(Source: Part Two Report of the Walkerton Inquiry, O'Connor, 2002)

A description of each of these components, as they apply to the City of Waterloo's drinking water distribution system, is as follows.

Municipal Drinking Water Licence

The City of Waterloo was issued its first licence in August 2011. The licence, #112-101, requires renewal every five years; the current one, issued June 2021, will expire June 2026. The licence itself comprises 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 to not cause adverse effects in association with maintenance and repair of the drinking water system. Additional requirements for studies and source protection are not applicable to the City of Waterloo.

Schedule D – Conditions for Relief from Regulatory Requirements

Under Schedule D, the City of Waterloo is still eligible for regulatory relief on lead testing. The City is not eligible for any other forms of relief under the current licence.

Drinking Water Works Permit

The City of Waterloo was issued its first permit in August 2011. The permit, #112-201, 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 compromises the bulk of the permit. It 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. Provisions are identified for equipment with emissions to air and performance limits; however, this applies to equipment the City of Waterloo's drinking water system does not currently contain. There are no system-specific conditions or source protection requirements.

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.

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. It must include details of the proposed or projected financial position of the drinking water system with respect to operations, gross cash receipts and payments and must relate directly to the replacement of lead services.

Accreditation

All drinking water systems are required to be operated 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 City of Waterloo's QMS is documented within this Operational Plan.

DWQMS Operational Plan

The City of Waterloo's accreditation body is Intertek-SAI Global. The City has been accredited since November 2012; the most recent accreditation was renewed on November 20, 2024.

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.

Permit to Take Water

This component does not apply to the City of Waterloo as it is a distribution system only and does not take water for the purposes of supplying drinking water. The City has a non-potable well that does have a PTTW in compliance with the *Ontario Water Resources Act*.

Purpose

The purpose of this Operational Plan is to describe the comprehensive Drinking Water Quality Management System developed and implemented by the City of Waterloo, City Utilities for the operation and maintenance of its water distribution system. As required by the MECP's Director's Directions, a completed Subject System Description Form, Schedule "C", is provided in Appendix A.

This Quality Management System (QMS) Operational Plan includes references to all components of the Drinking Water Quality Management Standard (the Standard).

Scope

This Operational Plan covers the activities and personnel associated with all operational aspects of the water distribution system for the City of Waterloo, City Utilities.

This Operational Plan, the Procedures, Standard Operating Procedures, and other QMS documentation that are referenced herein are complementary to the legislated requirements for safe drinking water in the Province of Ontario.

The scope of the water distribution system begins at the point where treated water enters the City of Waterloo distribution main from the treatment facilities or transmission pipelines and ends at the property lines of the consumers. The scope does not cover metering. There are some dual mains (owned by both the City of Waterloo and the Regional Municipality of Waterloo) that function as both transmission and distribution and are maintained by the City of Waterloo.

DEFINITIONS AND ACRONYMS

Annual or Annually – refers to a calendar year; a period of one year beginning and ending with the dates conventionally accepted as marking the beginning and end of a year (January 1st to December 31st)

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)

Drinking Water System – a system of works, excluding plumbing, that is established for the purpose of providing users of the system with drinking water, as defined in s.2(1) of the *Act*

Document – included sound recording, video tape, film, photograph, chart, graph, map, plan, survey, book of account, and information recorded or stored by means of any device, as defined in s.2(1) of the *Act*

DGSSMS – Region of Waterloo and Area Design Guidelines and Supplemental Specifications for Municipal Services

DWQMS – Drinking Water Quality Management Standard

DWWP – Drinking Water Works Permit

MDWL – Municipal Drinking Water Licence

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

Municipal Residential Drinking Water System – a municipal drinking water system that does not serve a major residential development and is capable of supplying drinking water at a rate of more than 2.9 litres per second, same as defined in s.1(1) of Ontario Regulation 170/03 for “large municipal residential system”

MECP – Ontario Ministry of the Environment, Conservation and Parks

O. Reg. – Ontario Regulation

Owner – includes, in respect to a drinking water system, every person who is a legal or beneficial owner of all or part of the system, but does not include the Agency or any of its predecessors where the Agency or predecessor is registered on title as the owner of the system, as defined in s.2(1) of the *Act*

QMS – Quality Management System

Quality Management System Policy – means the policy described in DWQMS 2.0 developed for the Subject System

RMOW– Regional Municipality of Waterloo/Region of Waterloo

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

SOP –Standard Operating Procedure

The Standard – Drinking Water Quality Management Standard

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. Personnel comprising Top management is defined in DWQMS 9.0

WTP – Water Treatment Plant

REFERENCES

- Drinking Water Quality Management Standard version 2.0, April 2017
- Applicable Ontario Safe Drinking Water Legislation

1.0 DWQMS 1 QUALITY MANAGEMENT SYSTEM

1.1 PURPOSE

The City of Waterloo, as the Owner and Operating Authority of its drinking water system, is required to attain conformance to the Drinking Water Quality Management Standard (the Standard) developed by the Ministry of the Environment, Conservation and Parks (MECP) through the Municipal Drinking Water Licensing Program. This Operational Plan has been developed to represent the Operating Authority's Quality Management System (QMS) that conforms to the Standard and satisfies one of the requirements of the City's municipal drinking water licence, as outlined in the introduction section.

1.2 PROCEDURE

The City of Waterloo water distribution system receives treated water from the Regional Municipality of Waterloo (RMOW). This Operational Plan covers the water distribution system that is owned by the City of Waterloo (Owner) and operated by City Utilities (Operating Authority).

This Operational Plan was created by City Utilities to ensure that safe, reliable drinking water is provided to all the citizens, businesses, and visitors of Waterloo. It provides an understanding of the drinking water system, the responsibilities of both the Owner and the Operating Authority of the system, and a commitment to the provision of safe drinking water. Additionally, the Operational Plan enables the City of Waterloo to continue to plan, implement, check and continually improve the drinking water system, thereby ensuring ongoing confidence and security in the quality of the drinking water.

DWQMS 1-01 Compliance Schedule documents the annual schedule of required QMS activities; it is to be updated every year to accommodate City Utilities' QMS activities cited in the Operational Plan.

1.3 ASSOCIATED DOCUMENTS AND RECORDS

- DWQMS 1-01 Compliance Schedule
- Drinking Water Quality Management Standard

2.0 DWQMS 2 QUALITY MANAGEMENT SYSTEM POLICY

2.1 PURPOSE

It is a requirement of the Standard to create a policy which demonstrates the City's commitment to deliver safe drinking water and enhance consumer confidence in the quality of the drinking water.

2.2 PROCEDURE

The City of Waterloo's Quality Management System policy is:

The City of Waterloo receives treated water from the Regional Municipality of Waterloo and is responsible for distribution of treated water to our consumers.

The City of Waterloo is committed to:

- **Provide** – safe drinking water by working together with our consumers and the Regional Municipality of Waterloo.
- **Improve** – and maintain the Quality Management System for the water distribution system.
- **Comply** – with all applicable legislation and regulations, including the City's drinking water licence and permit.
- **Communicate** – openly and effectively to the public concerning matters of drinking water quality.

DWQMS 2-01 Quality Management System Policy is endorsed by Top Management. Signed copies can be found in the following locations:

- The front entrance of the Waterloo Service Centre (WSC);
- The meter shop (at the WSC);
- The staff stairwell (at the WSC); and,
- On the City of Waterloo's website.

2.3 ASSOCIATED DOCUMENTS AND RECORDS

- DWQMS 2-01 Quality Management System Policy, signed by Top Management
- DWQMS 3.0 Commitment and Endorsement

3.0 DWQMS 3 COMMITMENT AND ENDORSEMENT

3.1 PURPOSE

The purpose is to communicate the Owners' and the Top Management of the Operating Authority's commitment to and endorsement of the QMS.

3.2 PROCEDURE

The Owner and Top Management of the Operating Authority (as defined in DWQMS 9.0 and referred to henceforth as Top Management) are committed to the implementation, maintenance and continual improvement of a QMS that meets the requirements of the Standard. The QMS for the drinking water distribution system is documented in the Operational Plan.

3.2.1 Proof of Commitment and Endorsement

Proof of commitment and endorsement is demonstrated by the Owner and Top Management in the following ways:

a) The Owner

Endorsement of the Operational Plan from the Owner (Mayor/Council) shall be obtained by approval of a Council report requesting endorsement and demonstrated by certified Council minutes. The certified Council Resolution is provided in Appendix B. Commitment is evidenced by the resources provided for the implementation, maintenance and continual improvement of this Operational Plan and the QMS.

b) Top Management

Endorsement of the Operational Plan from Top Management is demonstrated by signatures of the top managers on DWQMS 3-01 Top Management Endorsement. Commitment is evidenced by:

a) Ensuring that a QMS is in place that meets the requirements of the Standard,
b) Ensuring that Operating Authority staff are aware of all applicable legislation and regulatory requirements (DWQMS 4.0 QMS Representative),
c) Communicating the QMS according to procedure for communications (DWQMS 12-01 Communication Procedure), and
d) Determining, obtaining or providing the resources needed to maintain and continually improve the QMS (DWQMS 20-01 Management Review Procedure).

3.2.2 Re-endorsement Requirement

Re-endorsement of the Operational Plan shall be obtained:

- By the Owner when there is a change in Mayor/Council personnel; and
- By Top Management when there is a major change in the Operational Plan or when there is a change in personnel.

3.3 ASSOCIATED DOCUMENTS AND RECORDS

- Certified Council Resolution in Appendix B
- DWQMS 3-01 Top Management Endorsement
- DWQMS 4.0 QMS Representative
- DWQMS 9.0 Organizational Structure, Roles, Responsibilities and Authorities
- DWQMS 12-01 Communication Procedure
- DWQMS 20-01 Management Review Procedure

4.0 DWQMS 4 QUALITY MANAGEMENT SYSTEM REPRESENTATIVE

4.1 PURPOSE

To describe the role and specific responsibilities of the QMS Representative as it pertains to the operation and maintenance of the QMS.

4.2 PROCEDURE

4.2.1 Appointment

The Compliance Coordinator is appointed by Top Management to the role of QMS Representative for the City of Waterloo water distribution system QMS. The appointment is documented in DWQMS 4-01 QMS Representative Appointment.

The QMS Representative Alternate is designated to the positions of Supervisor of Compliance and Data, Compliance Specialist, and Compliance Assistant.

4.2.2 Responsibilities

The QMS Representative has the following responsibilities which are fulfilled through the following mechanisms:

1. Develop, implement, and maintain the QMS:
   - Follow the DWQMS 1-01 Compliance Schedule to meet timeline requirements;
   - Conduct an annual review and update of the Operational Plan and all procedures;
   - Conduct internal audits; and,
   - Utilize non-conformance corrective actions and action item requests for continual improvement.
2. Report on the effectiveness of the QMS to Top Management through:
   - Internal audits;
   - External audits; and,
   - Management review.
3. Ensure that the current versions of documents required by the QMS are in use at all times:
   - Remove old versions of documents and forms from electronic files and the Forms Binder kept in the meter shop and in the Manager of Water Operations and Maintenance office;
   - Do not overwrite or do a save as on an existing electronic file, it may not be the most current version, always use the template document or form;
   - Completed field forms are to be reviewed by the Manager of Water Operations and Maintenance, or designate, to ensure the most current version of the form was submitted; and,

- The current revision number is identified on the Master List of Documents and Records.

4. Ensure that all personnel are aware of all current legislation and regulatory requirements that are relevant to the operation of the works:
   - Staff are required to attend training courses to upkeep their certification;
   - The QMS Representative shall check the Environmental Registry of Ontario (ERO) and Ministry of Environment, Conservation and Parks websites for legislative changes on a twice-per-year basis; and,
   - Relevant updates are provided at City Utilities staff meetings.
5. Promote the QMS throughout the water distribution system:
   - The QMS policy is posted at three locations within the Waterloo Service Centre and on the City's website;
   - QMS updates are provided at City Utilities staff meetings;
   - Annual QMS update presentations are given to relevant staff after the Operational Plan has been updated; and,
   - Relevant QMS information is communicated to the Owner, as per DWQMS 12-01 Communication Procedure.

4.3 ASSOCIATED DOCUMENTS AND RECORDS

- DWQMS 4-01 QMS Representative Appointment
- DWQMS 1-01 Compliance Schedule
- DWQMS 2-01 QMS Policy
- DWQMS 12-01 Communication Procedure
- Action Item Request forms
- Internal Audit Reports
- External Audit Reports
- Management Review Summary Reports
- Management Review meeting minutes
- City Utilities staff meeting agendas and minutes

5.0 DWQMS 5 DOCUMENT AND RECORD CONTROL

5.1 PURPOSE

These procedures outline and define the process for managing, maintaining and protecting all documents and records required for the conformance of the QMS.

5.2 PROCEDURE

The procedures, DWQMS 5-01 Document Control and DWQMS 5-02 Record Control, describe how QMS documents and records are controlled, including instructions related to currency, legibility, availability, retention, and storage.

The Master List of Documents and Records is a complete list of all system components and contains the following documentation:

- Operational Plan;
- DWQMS Procedures;
- Standard Operating Procedures;
- Forms;
- Records;
- Templates;
- Equipment Manuals;
- Training Materials; and,
- Distribution Drawings.

5.3 ASSOCIATED DOCUMENTS AND RECORDS

- DWQMS 5-01 Document Control Procedure
- DWQMS 5-02 Record Control Procedure
- Master List of Documents and Records

6.0 DWQMS 6 DRINKING WATER DISTRIBUTION SYSTEM

6.1 PURPOSE

To provide an overview of the City of Waterloo's drinking water distribution system.

6.2 PROCEDURE

6.2.1 General Information

The City of Waterloo owns the water distribution system; City Utilities is responsible for the operation of the Class 2 water distribution system, including pipes, valves, and hydrants. The City's water distribution system serves a population of 155,550 people (end of 2024 estimated by the Region of Waterloo). The population figure includes temporary non-resident students (33,610) and is based on the Region of Waterloo's 2024 Year-End Population. The water distribution system consists of the following (2024 data from the 2025 Infrastructure Review Report):

- 441.98 kilometres of distribution main
- 31,652 water connections (active accounts)
- 2,607 hydrants (not including private hydrants)
- 5,082 valves (not including curbstop service valves or control valves)

The City of Waterloo's distribution system dates back to 1899; extensive replacement and extension of the distribution system has occurred since that time. The water distribution system watermains range in size from 50 mm to 450 mm in diameter and are constructed of cast iron, ductile iron, concrete, asbestos-cement (AC), high-density-polyethylene (HDPE), polyethylene (PE) or polyvinyl chloride (PVC). Any alteration to the City's distribution system requires completion of the Form 1 - Record of Watermains Authorized as a Future Alteration.

There are 7.8 kilometres of dual mains (owned by both the City of Waterloo and the Regional Municipality of Waterloo) that function as both transmission and distribution. The dual mains are shared with the Regional Municipality of Waterloo (RMOW) but are maintained by City of Waterloo, City Utilities. Any alterations to dual mains require completion of the Form 1 under the Drinking Water Works Permit by the initiating municipality, and the Form 1 is to be signed off by both the City of Waterloo and the RMOW. The role of Overall Responsible Operator (ORO) for dual mains is the responsibility of the City of Waterloo.

The City of Waterloo's distribution system does not provide treatment to the water; therefore, there is no chlorine boosting, ultraviolet (UV) irradiation, secondary disinfection, and pressure boosting or pressure control within the control of the water distribution system. The RMOW is responsible for the water supply and water treatment. The City shares responsibility with the RMOW to regularly test water

and ensure that the standards set out by the Ontario Ministry of Environment, Conservation and Parks are being met or exceeded.

Scheduled flushing is performed at City's locations identified as possible candidates for experiencing problems with maintaining acceptable chlorine residuals which could result in unsafe drinking water. In 2024, there were 40 scheduled flushing locations in the distribution system. All of the flushing locations are checked and tested on a weekly to quarterly basis, with frequencies adjusted where there is highest potential for decay in chlorine residual. Flushing may be scheduled throughout the City at additional locations to maintain acceptable chlorine residuals and/or water aesthetic standards.

6.2.2 Distribution System Components and Process Flow Description

The City of Waterloo's water distribution system relies upon all RMOW pumping stations and treatment systems for supply and treatment of incoming water. As seen in the diagram below, the water distribution system begins at the point where treated water enters the City of Waterloo distribution mains from the treatment facilities or transmission pipelines. The water source for Waterloo's water distribution system is the RMOW Integrated Urban System that encompasses the Erb Street Reservoir (including wells W6A, W6B, W7, W8, and W10), the Mannheim Well Supply, and the Mannheim Water Treatment Plant (WTP). In May 2023, the William Street Water Supply wellfield was disconnected from the City's distribution system. The William Street wellfield will be connected to the Kitchener Drinking Water System: Strange Street Well Supply.

Within Waterloo's water distribution system, there are six distinct pressure zones. Pressure challenges are investigated and addressed by the RMOW, including the implementation of a new pressure zone.

The water distribution system also provides water to the City of Kitchener's neighbourhood of Falconridge and the watermain on Sunbridge Crescent. Falconridge is located off the southeast corner of Waterloo's distribution system and is fed by a City of Waterloo 200 mm PVC watermain running under Woolwich Street. Waterloo's system is separated by a pressure reducing valve. A secondary feed is available off Woolwich Street at Hawkswood Drive. City of Kitchener watermain on Sunbridge Crescent is fed by a City of Waterloo 150 mm PVC watermain connecting to the 200 mm PVC watermain running under Woolwich Street. The City of Waterloo is responsible for the delivery of safe drinking water up to the City of Kitchener border, at which point it enters their system and becomes the City of Kitchener's responsibility. The City of Waterloo does not add treatment of any kind, nor does it boost pressure. The Owner and the Operating Authority of Falconridge is Kitchener Utilities.

The water distribution system also provides water to the commercial development north of the City of Waterloo at Weber Street within the Township of Woolwich. The plaza is supplied water via a City of Waterloo 300 mm PVC watermain running under Weber Street North. A secondary feed, a 300 mm PVC watermain, is available to this development via Kumpf Drive. Both these watermains are protected using a check valve. The City of Waterloo is responsible for the delivery of safe drinking water up to the Woolwich border, at which point it enters their system and becomes the Township of

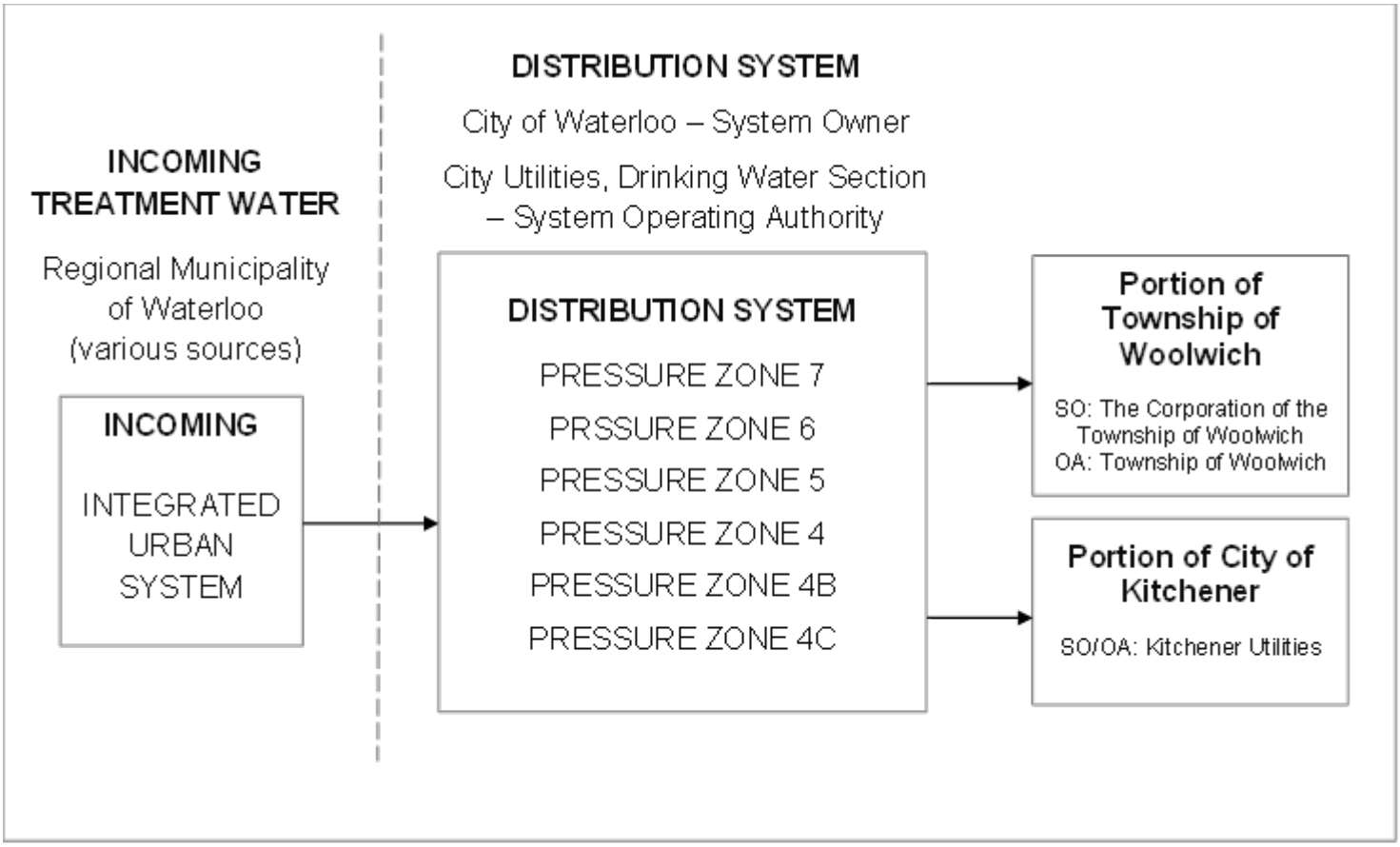
Woolwich's responsibility. The City of Waterloo does not add treatment of any kind, nor does it boost pressure. The Owner and the Operating Authority of this commercial development is the Corporation of the Township of Woolwich and the Township of Woolwich respectively.

Lastly, there are several individual border properties within the City of Kitchener and Township of Woolwich that are directly serviced by the City of Waterloo. These properties are catalogued in the GIS.

The City of Waterloo annually publishes Water Drawings, or schematics. These schematics are a small-scale representation of the water distribution system and all appurtenances.

The process flow diagram can be seen in Figure 1, below.

Figure 1: Process Flow Diagram



Note: SO – System Owner OA – Operating Authority

6.2.3 Municipal Drinking Water Licence and Drinking Water Works Permit

A municipal drinking water licence and a drinking water works permit is issued by the Ontario Ministry of Environment, Conservation and Parks; the licence is valid for five years, the permit does not expire. For more information refer to the Introduction.

6.2.4 Description of Water Supplied by the Regional Municipality of Waterloo

(Source: 2024 Water Quality Reports for Integrated Urban System and Rural Water Supply Systems by the Region of Waterloo)

The RMOW owns and operates all the treatment plants and equipment, pumps and SCADA system, which controls the quality and pressure of the supply, and supplies the City of Waterloo with all its drinking water. RMOW supply water is comprised of treated groundwater from the Erb Street Reservoir, and the Mannheim Reservoir, where treated water from the Mannheim WTP is blended with water from the Mannheim wells. Below is a description of all the sources that feed in the City of Waterloo's water distribution system. It is recognized that the operational status of these sources may vary at the discretion of the Region of Waterloo.

The **Erb Street Well System** is comprised of four groundwater wells W6B, W6C, W7 and W8. These wells pump into the Erb Street Reservoir. The Erb Street Reservoir has a capacity of 18,000 cubic meters (four million imperial gallons). Disinfection at each of the wells is achieved by the use of sodium hypochlorite systems consisting of solution tanks complete with spill containment and protection and metering pumps dispensing commercial 12% sodium hypochlorite solution. Ammonium sulphate is added to the water at the inlet of the Erb Street Reservoir. The purpose of the ammonium sulphate is to convert the free chlorine to the combined form, creating a more stable distribution disinfectant. Continuous analyzers monitor the levels of chlorine and turbidity prior to the water being discharged. The analyzers are connected with the Mannheim WTP SCADA system which is monitored 24 hours per day. There is no emergency standby power available at this site. However, there is a connection for a portable emergency generator located at the Erb Street Reservoir. The Erb Street Reservoir also supplies the community of St. Agatha in Township of Wilmot via a 400mm PVC watermain that is owned and operated by the Region of Waterloo.

Well W10 pumps directly into the Waterloo distribution system. Disinfection is achieved by the use of UV irradiation and a sodium hypochlorite system consisting of a solution tank complete with spill containment and protection and metering pumps dispensing commercial 12% sodium hypochlorite solution. The UV is for primary disinfection. The sodium hypochlorite is for secondary disinfection to maintain detectable chlorine residual in the treated water. Ammonium sulphate is injected, converting free chlorine to the combine form, providing more stable disinfectant. Continuous analyzers monitor the levels of chlorine, turbidity and UV dosage prior to the water being discharged. The analyzers are connected with the Mannheim WTP SCADA system which is monitored 24 hours per day. There is no emergency standby power at this site.

In May 2023, the William Street Water Supply was disconnected from the City's distribution system and all William Street ground wells (W1B, W1C, W2 and W3) were connected to the **Strange Street Well Supply** in Kitchener. This groundwater supply also comprises five wells K10A, K11A, K13B, K18 and K19, a treatment facility and an in ground clear well/reservoir. The total storage capacity of the reservoir is 250 cubic meters. Three high lift pumps are used to discharge the threated water into the distribution system. The treatment facility has three pressure filters filled with greensand media and anthracite used for removal of iron and manganese. Disinfection is achieved by use of sodium hypochlorite systems consisting of solution tanks complete with spill containment and protection and metering pumps dispensing commercial 12% sodium hypochlorite solution. The sodium hypochlorite is also used as an oxidizing agent prior to filtration. Upon discharge to the distribution system, 20% ammonium sulphate in injected to combine free chlorine to the combined form for a more stable distribution disinfectant. Continuous analyzers monitor the levels of chlorine and turbidity prior to the water being discharged. The analyzers are connected with the Mannheim WTP SCADA system which is monitored by an operator 24 hours per day. This site has no emergency standby power available on site.

The Region has installed a new water treatment system at the Laurel tank site and will be making changes to the water distribution configurations (Zones 4 and 5). The Laurel Water Treatment Plant was brought into service in February 2024. The Laurel well system is a ground water supply consisting of one well, W25, a treatment facility and clear well/reservoir. The total storage capacity of the reservoir is 399 cubic meters. Disinfection is achieved by the use of sodium hypochlorite systems consisting of solution tanks complete with spill containment and protection and metering pumps dispensing commercial 12% sodium hypochlorite solution. The sodium hypochlorite is also used as an oxidizing agent prior to filtration. Upon discharge to the distribution system, 20% ammonium sulphate is injected. The purpose of the ammonium sulphate is to convert free chlorine to the combined form, creating a more stable distribution disinfectant. Continuous analyzers monitor the levels of chlorine prior to the water being discharged. The analyzers are connected with the Mannheim Water Treatment Plant SCADA system which is monitored 24 hours per day. There is emergency standby power available at this site.

The **Mannheim WTP** receives raw water from the Hidden Valley Low Lift Station located at the Grand River. Two submersible pumps are used to pump the river water into the Hidden Valley High Lift (HVHL) Reservoir, and from there, three booster pumps are used to pump the raw water from the HVHL Reservoir to the Mannheim WTP. The raw water entering the WTP is treated with coagulation, flocculation, sedimentation, ozonation and filtration. Immediately after filtration, the water is disinfected prior to entering the clearwells/reservoirs. There are two clearwells/reservoirs that have a combined total usable volume of 15.28 million litres. Disinfection is achieved through ozonation, UV irradiation, followed by chlorination via a gas chlorination system. Continuous analyzers monitor the levels of ozone, chlorine, turbidity and UV prior to the water being discharged. The analyzers are connected to the Mannheim WTP SCADA system which is monitored by an operator 24 hours a day. The water

from the Mannheim Aquifer Storage and Recovery wells: ASR1, ASR2, ASR3, ASR4, ASR5, RCW2, RCW3, RCW4, can be mixed with the treated water and then stored in the clearwells/reservoirs. This water is then directed to the Mannheim Pumping Station Reservoir, where it blends with eight other groundwater wells: K21, K21A, K25, K29, K91, K92, K93 and K94. Treated water from Mannheim Village wells K23, K24, K26 and Shingletown wells K50 and K51 can also indirectly supply the Mannheim Pumping Station Reservoir. This reservoir has a total storage capacity of 101.3 million litres. Prior to entering the Mannheim Pumping Station Reservoir, 20% liquid ammonium sulphate is injected to convert free chlorine to the combined form, creating a more stable distribution disinfectant. This facility has emergency standby power available.

As a result of a plebiscite during the 2010 municipal election, the citizens of the City of Waterloo voted to discontinue the addition of fluoride to its drinking water. Upholding the results of the plebiscite, the Region of Waterloo ceased fluoride treatment in water received by the City of Waterloo in November 2010.

6.2.5 Challenging Conditions

The following events may cause issues with the **water supply**:

- Spring thaw may increase overland run-off into the Grand River, affecting overall water quality;
- Grand River temperature changes may cause odour challenges in the source water;
- Freeze/thaw cycle and extreme temperatures may cause more main breaks in the system potentially resulting in pressure issues and water quality issues;
- Increased water usage can result in pressure challenges in some areas of the system;
- Increased water age can result in decreased water quality;
- Maintenance and upgrades to the transmission mains that may impact flow, pressure, and water quality challenges in some areas of the distribution system;
- Inadequate mixing in stand pipes and reservoirs can result in decreased water quality; and,
- Increases and decreases in water temperature may affect overall water quality.

Event-driven fluctuations that may result in operational challenges and threats within the **distribution system** are identified in DWQMS 8-01 Risk Assessment Outcomes. DWQMS 8-01 Risk Assessment Outcomes factors potential effects of climate change, including but not limited to, an increase in severity or frequency of challenging conditions listed above. Additional event-driven fluctuations may include:

- Freeze/thaw cycle and extreme temperatures may cause more main breaks in the system potentially resulting in pressure and water quality issues;
- Increases and decreases in water temperature could affect the water quality;
- Decreases in water usage in some areas could affect the water quality;
- Inadequate mixing in stand pipes and reservoirs may result in increased water age and decreased water quality;

- Operational checks and maintenance on the system such as flushing, watermain break repairs, hydrant flow testing, and hydrant and valve repair/replacement could disrupt the system, causing discoloured water; and,
- Fires result in a sudden demand on the system and may result in discoloured water events.

6.3 ASSOCIATED DOCUMENTS AND RECORDS

- Annual Water Quality Reports for Integrated Urban System and Rural Water Supply Systems by the Region of Waterloo
- DWQMS 8-01 Risk Assessment Outcomes
- SOP-W-4 Weekly Chlorine Residual Monitoring Program

7.0 DWQMS 7 RISK ASSESSMENT

7.1 PURPOSE

To ensure all potential hazards or hazardous events associated with drinking water quality are identified and assessed. The results of identifying and assessing hazards provide staff with guidance to control and properly respond to potential conditions and safeguard the drinking water quality.

7.2 PROCEDURE

DWQMS 7-01 Risk Assessment Procedure describes the process for identifying, assessing, and ranking risks to the drinking water system, as well as identifying critical control points.

DWQMS 8-01 Risk Assessment Outcomes displays the results.

7.3 ASSOCIATED DOCUMENTS AND RECORDS

- DWQMS 7-01 Risk Assessment Procedure
- DWQMS 8-01 Risk Assessment Outcomes

8.0 DWQMS 8 RISK ASSESSMENT OUTCOMES

8.1 PURPOSE

To establish an effective and organized approach to conducting, assessing and improving hazard risks associated with the drinking water system.

8.2 PROCEDURE

The risk assessment must be conducted as per DWQMS 7-01 Risk Assessment. The results of the risk assessment are to be recorded in the table DWQMS 8-01 Risk Assessment Outcomes, DWQMS 8-02 Critical Control Points and Critical Control Limits and DWQMS 8-03 Risk Management Control Measures Descriptions.

8.3 ASSOCIATED DOCUMENTS AND RECORDS

- DWQMS 7-01 Risk Assessment Procedure
- DWQMS 8-01 Risk Assessment Outcomes
- DWQMS 8-02 Critical Control Points and Critical Control Limits
- DWQMS 8-03 Risk Management Control Measures Descriptions

9.0 DWQMS 9 ORGANIZATIONAL STRUCTURE, ROLES, RESPONSIBILITIES AND AUTHORITIES

9.1 PURPOSE

To document a process that ensures the Owner and Top Management of the Operating Authority are defined, the organizational structure of the Operating Authority is described and the roles, responsibilities and authorities of Top Management and key positions within the Operation Authority are identified.

9.2 PROCEDURE

9.2.1 Organizational Structure

The organizational structure, as it relates to the drinking water distribution system, is documented in DWQMS 9-01 Drinking Water Distribution System Organizational Structure.

The City of Waterloo (Mayor and Council) is the Owner and The City of Waterloo's City Utilities Division is the Operating Authority for Waterloo's drinking water distribution system.

9.2.2 Identifying Key QMS Roles

Key QMS roles are identified in DWQMS 9-01 Drinking Water Distribution System Organizational Structure.

The Top Management Team is comprised of:

- Commissioner of Integrated Planning and Public Works;
- Director of City Utilities;
- Manager of Water Operations and Maintenance;
- Manager of Compliance and Programs; and,
- Supervisor of Water Operations and Maintenance.,

The QMS Representative and alternate(s) are documented in DWQMS 4 QMS Representative.

9.2.3 Organizational Roles, Responsibilities and Authorities

Key drinking water distribution system roles, associated responsibilities and authorities, as they relate to water distribution system, are documented in DWQMS 9-02 Drinking Water Distribution System Roles, Responsibilities and Authorities.

Specific roles and responsibilities for positions with key roles in the DWQMS are detailed in various procedures.

9.3 ASSOCIATED DOCUMENTS AND RECORDS

- DWQMS 9-01 Drinking Water Distribution System Organizational Structure
- DWQMS 9-02 Drinking Water Distribution System Roles, Responsibilities and Authorities

10.0 DWQMS 10 COMPETENCIES

10.1 PURPOSE

To determine minimum competency requirements for personnel performing duties directly affecting drinking water quality and to identify the means needed to meet those competencies.

10.2 PROCEDURE

The DWQMS 10-01 Competencies Procedure describes the process for identifying, developing, and maintaining required competencies for personnel performing duties directly affecting drinking water quality. Additionally, it describes activities to ensure personnel are aware of the relevance of their duties. Employee and training records show evidence of activities to meet and maintain the competencies described in the procedure, and to ensure personnel awareness.

10.3 ASSOCIATED DOCUMENTS AND RECORDS

- DWQMS 10-01 Competencies Procedure

11.0 DWQMS 11 PERSONNEL COVERAGE

11.1 PURPOSE

To ensure continuous coverage and availability of certified and competent personnel for the drinking water distribution system to address all issues relating to and carry out necessary duties that directly affect the drinking water quality.

11.2 PROCEDURE

The DWQMS 11-01 Personnel Coverage Procedure describes the process for ensuring personnel are available for duties that directly affect the drinking water quality. Additionally, the DWQMS 11-02 ORO/OIC Designation Procedure describes the process for designating a temporary Overall Responsible Operator/Operator in Charge; DWQMS 11-03 Essential Services Business Continuity identifies the services City Utilities provides and whether each one is mandatory, emergency only or is not to be performed during times of staff shortages.

11.3 ASSOCIATED DOCUMENTS AND RECORDS

- DWQMS 11-01 Personnel Coverage Procedure
- DWQMS 11-02 ORO/OIC Designation Procedure
- DWQMS 11-03 Essential Services Business Continuity

12.0 DWQMS 12 COMMUNICATIONS

12.1 PURPOSE

To ensure internal and external communication of the QMS is completed as required.

12.2 PROCEDURE

The DWQMS 12-01 Communications Procedure describes the process for ensuring relevant aspects of the QMS are communicated between Top Management and the Owner, water distribution system personnel, suppliers, and the public.

12.3 ASSOCIATED DOCUMENTS AND RECORDS

- DWQMS 12-01 Communications Procedure

13.0 DWQMS 13 ESSENTIAL SUPPLIES AND SERVICE PROVIDERS

13.1 PURPOSE

To identify the supplies and services deemed essential to the delivery of safe drinking water and to describe how the quality of these services is ensured.

13.2 PROCEDURE

The DWQMS 13-01 Essential Supplies and Services Procedure describes the process for identifying essential supplies and services, and ensuring quality requirements and procurement methods are established and communicated.

13.3 ASSOCIATED DOCUMENTS AND RECORDS

- DWQMS 13-01 Essential Supplies and Services Procedure

14.0 DWQMS 14 INFRASTRUCTURE REVIEW AND PROVISION

14.1 PURPOSE

To ensure an annual review of the adequacy of the infrastructure necessary to operate and maintain the subject system is completed as required.

14.2 PROCEDURE

The DWQMS 14-01 Infrastructure Review and Provision Procedure describes the process for the review of the infrastructure adequacy. The procedure also describes the provision of infrastructure and the communication of review findings to the Owner.

14.3 ASSOCIATED DOCUMENTS AND RECORDS

- DWQMS 14-01 Infrastructure Review and Provision Procedure

15.0 DWQMS 15 INFRASTRUCTURE MAINTENANCE, REHABILITATION AND RENEWAL

15.1 PURPOSE

To summarize City Utilities' infrastructure maintenance, rehabilitation and renewal programs.

15.2 PROCEDURE

15.2.1 Preventative Maintenance

DWQMS 15-01 Preventative Maintenance Schedule documents the inspection and maintenance program for distribution assets, including hydrants, valves and watermains; it is maintained by the Manager of Water Operations and Maintenance. Maintenance is performed as per the manufacturer recommendations or best practices, where applicable.

Standard Operating Procedures (SOPs) are available to staff on the network or as a hard copy in the Meter Shop for maintenance activities. City Utilities staff can consult the applicable SOP, if required to complete maintenance activities.

Planned maintenance is performed as allocated by the Manager of Water Operations and Maintenance and/or Supervisor of Water Operations and Maintenance who assign planned work to staff accordingly.

Unplanned maintenance can be assigned by the Manager of Water Operations and Maintenance, Supervisor of Water Operations and Maintenance, or Lead Hands.

Planned and unplanned maintenance performed is communicated to the Manager of Water Operations and Maintenance through the work order system and/or various reporting forms.

Any records generated are to be maintained in accordance with retention times identified in DWQMS 5-02 Record Control Procedure.

15.2.2 Rehabilitation and Renewal

The Director of City Utilities has the responsibility and authority to develop an infrastructure rehabilitation or renewal program, as per DWQMS 14-01 Infrastructure Review and Provision Procedure.

The infrastructure maintenance, rehabilitation and renewal programs, as well as long term forecasting of such activities, are reviewed and discussed at least once every calendar year through asset management meetings and the Infrastructure Review meeting. A summary of the data analyzed and discussed is documented via the Infrastructure Review Summary Report and the approved budget.

15.2.3 Alterations to the Drinking Water System and Related DWWP of MDWL Amendments

Any pre-authorized alterations or amendments to the DWWP are to be approved by City Utilities, as per DWQMS 15-02 Approval Procedure for Alterations to City's Water Distribution System. The MECP verifies the alterations records during the annual inspection.

15.2.4 Communication to Council

All maintenance, rehabilitation and renewal costs are considered by Council in the approval of the operating and capital budgets, as per DWQMS 14-01 Infrastructure Review and Provision Procedure.

15.2.5 Effectiveness Monitoring

The effectiveness of the preventative maintenance program is evaluated through the annual Infrastructure Review. The Summary Report reports on the following preventative maintenance activities:

- Flushing programs;
- Hydrant programs;
- Leak detection;
- Valve programs; and,
- Watermain rehabilitation and renewal.

15.3 ASSOCIATED DOCUMENTS AND RECORDS

- DWQMS 15-01 Preventative Maintenance Schedule
- DWQMS 15-02 Approval Procedure for Alterations to City's Water Distribution System
- DWQMS 5-02 Record Control Procedure
- DWQMS 14-01 Infrastructure Review and Provision Procedure
- Annual Infrastructure Review Summary Report

16.0 DWQMS 16 SAMPLING, TESTING AND MONITORING

16.1 PURPOSE

To ensure sampling, testing and monitoring is conducted to provide safe drinking water for the City of Waterloo's drinking water distribution system.

16.2 PROCEDURE

The DWQMS 16-01 Sampling, Testing and Monitoring Procedure describes procedures for sampling, testing and monitoring performed within the water distribution system.

16.3 ASSOCIATED DOCUMENTS AND RECORDS

- DWQMS 16-01 Sampling, Testing and Monitoring Procedure

17.0 DWQMS 17 CALIBRATION AND MAINTENANCE OF MEASUREMENT AND RECORDING EQUIPMENT

17.1 PURPOSE

To document the calibration and maintenance of measurement and recording equipment used for assessing the drinking water quality.

17.2 PROCEDURE

The DWQMS 17-01 Calibration and Maintenance of Measurement and Recording Equipment Procedure describes procedures for maintenance, calibration, and verification of measurement and recording equipment.

17.3 ASSOCIATED DOCUMENTS AND RECORDS

- DWQMS 17-01 Calibration and Maintenance of Measurement and Recording Equipment Procedure
- DWQMS 17-02 Calibration Schedule

18.0 DWQMS 18 EMERGENCY MANAGEMENT

18.1 PURPOSE

To establish an effective and organized response procedure that relates to maintaining the City's ability to provide safe drinking water.

18.2 PROCEDURE

The DWQMS 18-01 Emergency Management Procedure describes the process of maintaining a state of emergency preparedness for the drinking water distribution system.

18.3 ASSOCIATED DOCUMENTS AND RECORDS

- DWQMS 18-01 Emergency Management Procedure

19.0 DWQMS 19 INTERNAL AUDITS

19.1 PURPOSE

To ensure that the QMS meets or exceeds the requirements of the Standard and to confirm it is operating effectively.

19.2 PROCEDURE

DWQMS 19-01 Internal Audits Procedure describes the procedure for internal audits, including audit criteria, frequency, scope, records, methodology, and schedule.

19.3 ASSOCIATED DOCUMENTS AND RECORDS

- DWQMS 19-01 Internal Audits Procedure

20.0 DWQMS 20 MANAGEMENT REVIEW

20.1 PURPOSE

To document the process utilized by Top Management to conduct the Management Review.

20.2 PROCEDURE

Management reviews are conducted to assess and ensure the continuing suitability, adequacy and effectiveness of the QMS; DWQMS 20-01 Management Review Procedure describes this process.

20.3 ASSOCIATED DOCUMENTS AND RECORDS

- DWQMS 20-01 Management Review Procedure

21.0 DWQMS 21 CONTINUAL IMPROVEMENT

21.1 PURPOSE

To strive to continually improve the effectiveness of the QMS by implementing and conforming to the procedure.

21.2 PROCEDURE

City Utilities strives to continually improve the effectiveness of its QMS through the use of non-compliance, non-conformance, and opportunities for improvement.

DWQMS 21-01 Continual Improvement Procedure describes the process for identifying opportunities for improvement from:

- MECP's best management practices document (when published, at least once every 36 months)
- MECP inspection (opportunities for improvement and best practices);
- External audit;
- Internal audit;
- Management review;
- Risk assessment;
- Incident debriefing;
- Action item effectiveness completion assessment;
- Actions requiring longer-term projects;
- Annual Drinking Water Quality Report; and,
- Operator or staff feedback.

The Procedure also describes how an action item is initiated, assigned, documented, implemented and validated.

21.3 ASSOCIATED DOCUMENTS AND RECORDS

- DWQMS 21-01 Continual Improvement Procedure

HISTORY OF CHANGES

Revisions of documents are identified at the end of each document. Revision number, date, description of revision, and individual completing the revision are included for each controlled document.

The description of the revision should include the following information:

- Section that underwent changes;
- The non-conformance corrective action number, if the changes were to address non-conformance corrective action;
- The action item request number, if the changes were to address action item requests.

Revision	Date	Description	By
Previous revisions	n/a	History of Changes includes revisions from the last two revisions/years. For descriptions of previous revisions, see earlier versions of the Operational Plan found in OpenText	L. McKenzie
18	September 27, 2024	**Annual Update: All:** Updated accreditation body name from SAI Global to Intertek-SAI Global, reduced History of Changes to last two revisions/years. The annual review for each element is summarized in this table. **DWQMS 1.3:** Renamed QMS Schedule to Compliance Schedule. **DWQMS 1-01**: Updated QMS Schedule for 2024 and 2025, renamed Compliance Schedule to reflect Compliance Team focus, assigned lead staff responsibilities, and completed various updates to reflect current practices and terminology. **DWQMS 2-01**: Updated policy signatures, and updated personnel designated as Top Management. **DWQMS 3-01**: Updated Top Management and QMS signatures, and updated personnel designated as Top Management. **4.2.1:** Completed various updates to reflect current roles and responsibilities. **4.2.2:** Completed various updates to reflect current practices and terminology and changed Ministry website review from quarterly to twice/year. **DWQMS 4-01**: Updated Top Management and QMS Representative signatures, and updated name of QMS representative to current representative. **DWQMS 5-01**: Consolidated first steps in Figure 1 Process Flow and modified diagram to add clarity, updated QMS Representative Alternate references to reflect use of multiple alternates, and integrated and clarified approval of Health & Safety components within new and modified Standard Operating Procedures (SOPs). **DWQMS 5-02:** Assigned the responsibility of archive scheduling to Compliance Assistant. **6.2.1:** Completed various updates to reflect current data and scheduling. **6.2.2**: Clarified community names for distribution system description and flow diagram. **6.2.2 & 6.2.4:** Updated to reflect that William Street Water Supply was disconnected from the City's distribution system and that all William Street ground wells are connected to the Strange Street Well Supply in Kitchener. **DWQMS 7-01**: Included additional personnel in the Risk Assessment process to reflect best management practice, redefined attendance requirements and defined quorum of Top Management, expanded roles that contribute to the Risk Assessment as invitees and/or subject matter experts in the annual or 36-month review, rescheduled the annual review to occur between Infrastructure Review and Management Review, added outcomes of Infrastructure Review as consideration for currency of risk assessment information, and added the annual review will be documented via meeting minutes and circulated to Top Management by the QMS Representative in accordance with section 5.0 Procedure – Risk Assessment Methodology. **DWQMS 8-01**: Increased the water supply shortfall (source water) likelihood from 1 to 3 "possible", thus raising the Level of Risk from low to moderate for this year as agreed to by the Risk Assessment Team based on the overall water supply concerns expressed in the 2024 Risk Assessment meeting. **DWQMS 8-02 & 8-03**: No changes made as document reflects current practices. **9.2.2**: Updated personnel designated as Top Management and completed various updates to reflect current Compliance Team roles and responsibilities.	L. McKenzie

Revision	Date	Description	By
		DWQMS 9-01: Completed various updates to reflect current roles and responsibilities. **DWQMS 9-02**: Completed various updates to reflect current roles and responsibilities and added understanding of Standard of Care to Owner and Top Management responsibilities. **DWQMS 10-01:** Completed various updates to reflect current roles and responsibilities, adapted required competencies as appropriate, added understanding of Standard of Care to Owner and Top Management, added requirement for O&M training in Operator competencies, added 4.5.2 for responsibility on O&M training, and added 5.4.2 for relevant QMS Awareness training with other divisions. **DWQMS 11-01**: Added definitions for QMS Representative, QMS Representative Alternate and Top Management, added leaves of absence to 4.8.1 and 4.8.2, added 4.8.5 to address shortages in QMS personnel, and added 4.8.7 to define "qualified personnel". **DWQMS 11-02**: No changes made as document reflects current practices. **DWQMS 11-03**: Changed wording from FTE to Full Time Employees for clarity and made no other changes as document reflects current practices. **DWQMS 12-01:** Updated location of the Operational Plan hard copies in 4.3.5 and completed minor language edits to add clarity. **DWQMS 13-01**: Added clarity around the Priority Contacts List responsibility and updates, added reference to Safety Data Sheet management and responsibility, added SOP-9 Managing Safety Data Sheets to list of documents and records to replace obsolete versions (SOP-2 New SDS and obsolete SOP-3 Updating SDS), reviewed the Essential Supplies and Services lists with the Manager and Supervisor of Water Operations and Maintenance and applied updates to reflect current requirements, and added 2.2 essential supplies stock quantities review. **DWQMS 14-01**: Updated Section 4 for flow, redefined attendance requirements, and defined quorum of Top Management. **DWQMS 15-01**: No changes made as document reflects current practices. **DWQMS 15-02**: Renamed Approval Procedure for Alterations to City's Water Distribution System, updated procedure for flow of information and to line up with the wastewater and storm water system alteration procedure and added new definitions. **DWQMS 16-01**: No changes made as document reflects current practices. **DWQMS 17-01**: Monthly Total and Free Chlorine Kit Verification form renamed Monthly Chlorine Meter Verification form, removed references to Maintenance and Recording Equipment binder which is no longer used, and replaced references to Enterprise with OpenText. **DWQMS 17-02**: Updated record locations to match actuals in OpenText. **DWQMS 18-01**: Updated seasonal incident debriefing requirements to by-request or as identified, and further embedded incident debriefs into training procedure, updated procedure for flow of information, revised procedure for updating priority contacts list, updated the electronic location of the Priority Contacts list, and expanded the list of staff requiring access to reflect current practice. **DWQMS 19-01**: Completed minor language edits and renamed QMS Schedule as Compliance Schedule. **DWQMS 20-01**: Redefined attendance requirements and defined quorum of Top Management, and updated section 4.1 for flow. **DWQMS 21-01**: Updated 4.6.6 for evaluation of obsolete AIRs.	
19	July 21, 2025	**Annual Update: DWQMS All**: Updated the following for consistency throughout: Ontario Regulation changed to O. Reg. QMS Rep changed to QMS Representative. Changed Element number to DWQMS number when referring to parts of the Operational Plan and not the MECP DWQMS Standard. **DWQMS Definitions and Acronyms:** Defined O. Reg. as Ontario Regulation. Defined DGSSMS as Region of Waterloo and Area Design Guidelines and Supplemental Specifications for Municipal Services. **DWQMS Intro:** Updated the most recent accreditation renewal date to November 20, 2024. **DWQMS 1-01:** Entered 2025 completion dates and scheduled 2026 tasks. Added essential services review. Updated the schedule and process for Priority Contacts review. Reorganized table into As Needed, Multiple Times Per Year, and Annual tasks. **DWQMS 2-01:** Updated policy to match latest corporate style standards. Updated signatures. **DWQMS 3-01, and 4-01:** Updated signatures. **DWQMS 5-01:** Added QMS Representative (Alternate) and defined the use of Basecamp as a document file location. **DWQMS 5-02:** Redundant backup of QMS Folder now stored in the Cloud; Renamed Information Management and Technology Services (IMTS) to Information and Technology division (IT). **DWQMS 6.0:** Defined O. Reg. and added DGSSMS to list of Acronyms and Definitions. **DWQMS 6.2.1:** Updated population and distribution system infrastructure data with 2024 numbers. Noted that the distribution system services numerous properties at the City of Kitchener and Town of Woolwich borders, to line up with 2024 Annual Report. **DWQMS 6.2.4:** Added description of the new Laurel Water Treatment Plant and updated descriptions of water supplied by the Region to align with wording in the 2024 Water Quality Report for Integrated	L. McKenzie

Revision	Date	Description	By
		Urban System and Rural Water Supply Systems by the Region of Waterloo. **DWQMS 7-01:** Updated Information Management and Technology Services (IMTS) to Information and Technology division (IT). **DWQMS 8-01:** Updated specific hazardous event references with generic wording; added new hazard profile for changes in pressure due to hydraulic zone operational changes. **DWQMS 8-02:** Defined undefined backflow acronyms. **DWQMS 8-03:** Updated references to Kitchener Utilities After Hours Dispatch to After Hours Dispatch. **DWQMS 9-01:** Updated roles and responsibilities to align with current staffing; added new Supervisor of Metering and Locates and Wastewater Technologist roles. Included Managers of Design and Construction and Development Engineering in table. **DWQMS 10-01:** Added Supervisor of Metering and Locates' new role. Updated Customer Accounts Coordinator role to Accounts and Programs Coordinator. **DWQMS 11-01:** Revised wording for clarity. **DWQMS 11-02:** Added language from the regulations for temporary ORO and OIC appointments. Temporarily appointed OIC to have ORO and/or OIC review subsystem logbook reviewed each day. **DWQMS 11-03:** Updated to reflect current practices, staffing, and language. **DWQMS 12-01:** Added expectations for Systems Alterations training meeting minutes; Updated roles to align with personnel changes. **DWQMS 13-01:** Essential supply stock and essential service reviews split between the Compliance Coordinator (QMS Rep), who will review essential services, and the Compliance Assistant, who will review essential supply stock. Updated Priority Contacts maintenance procedure to align with new process. Added Stockroom availability and communication of availability to the procedure. Modified references to QMS documentation and communication to align with current process. **DWQMS 15-02:** Modified wording for clarity. Added Construction and Post Construction workflow. **DWQMS 16-01**: Updated definitions and acronyms, and documentation references. Removed reference to Township of Wilmot from list of downstream users. Added Nitrate/Nitrites sampling requirements. Replaced Inframap references with electronic entry. **DWQMS 17-02:** Added "Pocket Colorimeter" to Total and Free Chlorine Test Kits for consistency with calibration report language. **DWQMS 18-01:** Added reference to new Emergency Response SOP – After Hours Drinking Water Call Response. **DWQMS 19-01**: Modified wording to align with WWQMS. Added new Internal Audit forms (F87, F87a, and F87b). **DWQMS 20-01:** Changed QMS references to DWQMS to distinguish between different quality management systems. **DWQMS 21-01**: Added references to QMS Representative Alternate; corrected misdirected references.	