



The Corporation of the City of Kitchener Kitchener Utilities

Municipal Drinking Water System: Kitchener Distribution System

DWQMS Operational Plan

Operational Plan Number 019-401

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PART A - INTRODUCTION

Purpose

The purpose of this Operational Plan is to describe the comprehensive Drinking Water Quality Management System (DWQMS) developed and implemented by Kitchener Utilities for the operation and maintenance of its water distribution system.

This DWQMS Operational Plan includes references to all components of the DWQMS.

Scope

This Operational Plan covers the activities and personnel associated with all operational aspects of the drinking water distribution system for Kitchener Utilities, identified by waterworks number 260001458.

This Operational Plan, the procedures, work instructions and other DWQMS documentation that are referenced herein are complementary to the legislated requirements for safe drinking water in the Province of Ontario.

The scope of the waterworks begins at the point where treated water enters the watermain from the treatment facilities, and ends at the property lines of the consumers.

Permits and Licences

The waterworks system has the following permits and licences:

- Municipal Drinking Water Licences, Number 019-101
- Drinking Water Works Permit, Number 019-201
- Financial Plan, Number 019-301
- Operational Plan, Number 019-401

For Form 1 Review, the City of Kitchener reviews/approves for City owned watermains and the Region completes the review/approval for Regional owned watermains. For those watermains that are dual owned, it is the proponent's responsibility to contact the other owner so that both parties sign-off. Interconnections between the two systems are documented by both parties.

References

- Drinking Water Quality Management Standard
- Applicable Ontario Safe Drinking Water Legislation

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Definitions and Acronyms

• AOP	Advanced Oxidation Process
• CAO	Chief Administrative Officer
• Distribution	Watermains and related items (i.e. Hydrants, valves)
• DWQMS	Drinking Water Quality Management Standard
• GAC	Granulated Activated Carbon
• GIS	Geographic Information System
• ML	Mega Litre
• MECP	Ministry of Environment, Conservation and Parks
• OIC	Operator in Charge
• ORO	Overall Responsible Operator
• Primary Response Vehicle /263/Emergency Response Vehicle	Under the Ontario Energy Board distributors are secondary responders; the primary response to emergencies is provided by the 911 Emergency Response service. In Kitchener Utilities documents, Primary Response Vehicle refers to the Construction and Maintenance Kitchener Utilities vehicle/staff equipped and responsible to respond to emergencies.
• QMS	Quality Management System
• RMOW	Regional Municipality of Waterloo
• SCADA	Supervisory Control and Data Acquisition
• UV	Ultraviolet
• Waterworks	Kitchener Utilities Drinking Water Distribution System
• WTP	Water Treatment Plant

PART B - OPERATIONAL PLAN

Quality Management System

This Operational Plan describes the QMS which covers the drinking water distribution system that is owned and operated by Kitchener Utilities.

Kitchener Utilities receives treated water from the Regional Municipality of Waterloo (RMOW).

Quality Management System Policy

Kitchener Utilities owns, maintains and operates the City of Kitchener's Drinking Water Distribution System. At Kitchener Utilities, we are committed to supplying you with safe drinking water. We work together with the City of Kitchener and the Region of Waterloo to keep water matters top of mind. We are committed to these principles:

1. Quality

Kitchener water is safely treated and regularly tested according to government legislation and regulations for the consistent delivery of safe, quality drinking water. We are committed to maintaining and continually improving the Quality Management System, and complying with applicable legislation.

2. Trust

Trust us to look after your water needs by delivering quality water and reliable service.

3. Value

Tap water is the most economical choice.

4. Communication

We will communicate openly with the public concerning matters of drinking water quality.

Commitment and Endorsement

The Owner (Mayor and Council) and Top Management endorsement of the Operational Plan shall be demonstrated by a copy of the council meeting minutes where the Operational Plan is accepted and endorsed (see Appendix).

QMS Representative

The Manager, Quality Management and Water Programs is appointed by Top Management to the role of QMS Representative for the Kitchener drinking water distribution system QMS.

The QMS Representative has the responsibilities and authorities listed in the section of this Operational Plan called 'Organizational Structure, Roles, Responsibilities and Authorities'.

The appointment is documented and filed with the QMS Specialist and on Laserfiche.

Document and Record Control

Procedures are in place for Document Control and Record Control (attached in the Appendix). These procedures describe how QMS documents and procedures are controlled, including instructions related to currency, legibility, retention, and storage. All QMS system documentation is controlled. Methods of control are defined in the referenced procedures.

Records are maintained as objective evidence of conformance to the DWQMS and compliance with all applicable Safe Drinking Water Regulations.

The Master List of Documents is a complete list of all system components. The most current version of the Master List of Documents is also available.

Drinking Water Distribution System

The scope of the waterworks begins at the point where treated water enters the watermain from the Regional treatment facilities, and ends at the property lines of the consumers. There is no storage, chlorine boosting, secondary disinfection or pressure boosting within the control of the waterworks.

As of the end of 2022, the waterworks consists of approximately:

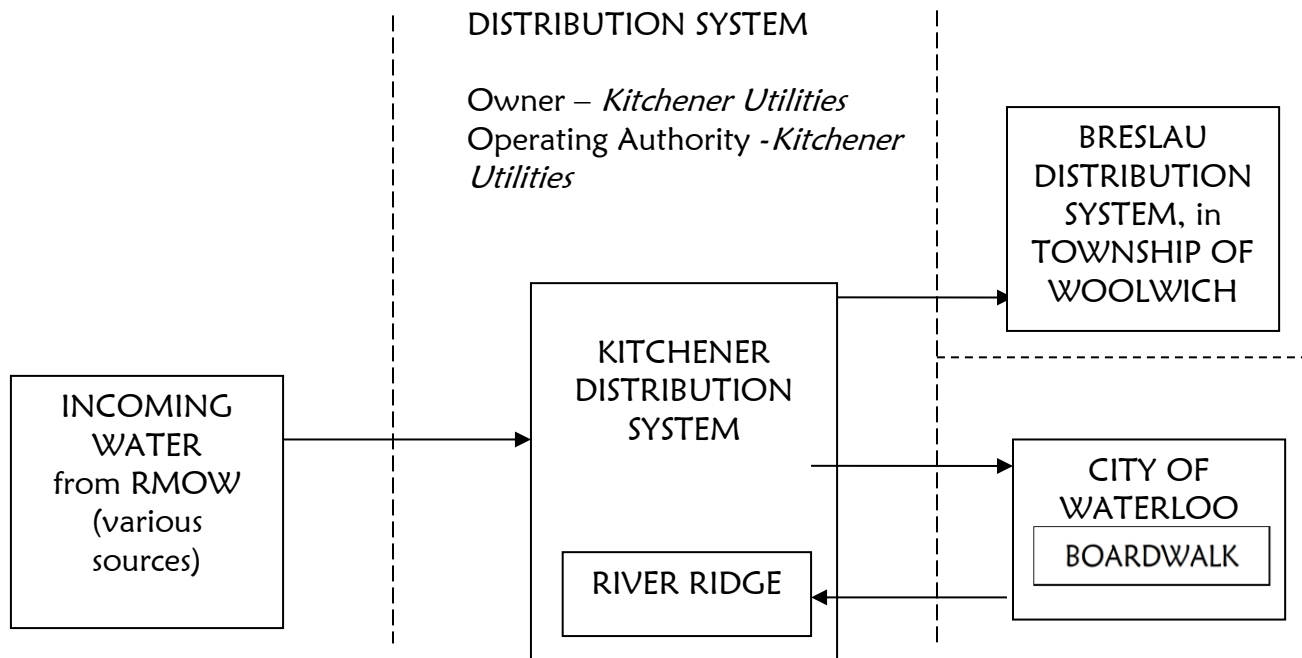
- 924.6 km of distribution watermain – 792 km Kitchener owned, 23 km Dual owned and 109 km Regional owned (20 km is untreated)
- 70,572 water meters in service
- 4,717 hydrants (not including private hydrants)
- 8,005 valves (not including service valves or hydrant valves) – 7,445 Kitchener owned, 130 Dual owned and 430 Regional owned

Hard copy maps are updated annually along with stats, however digital mapping changes are made daily (available electronically to field staff via laptops in the field). Electronic maps are

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updated daily are available internally and externally via Open Data. A copy of the map is included at the end of the Operational Plan.

Process Flow Chart



A map of the distribution system is available on Laserfiche and is filed with the Manager, Quality Management and Water Programs on an annual basis.

General Description

The supply system consists of multiple RMOW pumping stations, treatment systems and wells. Not all systems are required to be in operation at the same time to deliver adequate water supply.

The waterworks also provides distribution to the neighbourhood of River Ridge (commonly referred to as Falconridge). The City of Waterloo Distribution System supplies water to this community, but Kitchener Utilities owns, operates and maintains the distribution to River Ridge. The City of Kitchener supplies water to the City of Waterloo in the Boardwalk area.

The waterworks has a direct connection feeding water to Breslau, including a meter chamber. Breslau is a distribution system within the Township of Woolwich, which is owned and operated by the Township of Woolwich. The distribution system is not owned or operated by Kitchener Utilities.

Some watermain are shared with the RMOW (Dual owned) but are maintained by Kitchener Utilities. The RMOW is back-charged for the maintenance activities performed by the waterworks. The RMOW may participate in watermain repair, however Kitchener Utilities is the first responder.

Description of Water Source

The Kitchener Drinking Water Distribution System is part of the RMOW's Integrated Urban System. All drinking water is supplied by the RMOW's various water treatment plants; the location of these RMOW assets can be found in GIS via Arc Reader.

The water supplied by RMOW is controlled by the RMOW, who owns and operates the treatment plants and equipment, pumps and Supervisory Control and Data Acquisition (SCADA) system which controls the quality and pressure of the supply.

The Kitchener Water Distribution System is supplied by the following RMOW Water Supply Systems:

1. Greenbrook Well Supply System
2. K34 Well Supply System
3. Mannheim Water Treatment Plant
4. Parkway Well Supply System
5. Strange St. Well Supply System
6. Woolners (K80's) Well Supply System

More details regarding the above can be found at: www.regionofwaterloo.ca/water-reports

1. Greenbrook Well Supply System

The Greenbrook Well System is comprised of five ground water wells K1A, K2A, K4B, K5A and K8. These wells pump directly into the Greenbrook Treatment Plant and Pumping Station.

Iron and manganese removal is achieved through the use of three pressure filters. Following filtration, treatment for 1,4-dioxane is accomplished by an advanced oxidation process (AOP) using 50% hydrogen peroxide and Ultraviolet (UV) irradiation.

Treated water from the UV reactors proceeds through upflow Granular Activated Carbon (GAC) contactors before being transferred to 2 storage reservoirs with capacities of 2 million gallons (approximately 10,000 cubic metres) and 500,000 gallons (approximately 2400 cubic metres).

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Disinfection is achieved through Ultraviolet (UV) irradiation and by the use of a sodium hypochlorite system consisting of a solution tank complete with spill containment and protection and a metering pump dispensing commercial 12% sodium hypochlorite solution. 20% ammonium sulphate is added to the water at the discharge header of the pumping station prior to the water leaving the station. 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, turbidity, UVT and UV dosage prior to the water being discharged. The analyzers are connected with the Mannheim Water Treatment Plant SCADA system which is monitored by an operator 24 hours per day.

There is no emergency standby power at this site.

2. K34 Well Supply System

The K34 well supply is a groundwater supply consisting of two wells, K34 and K36, a treatment facility and an in ground clear well/reservoir. The total storage capacity of the reservoir is 90 cubic meters. Two high lift pumps are used to discharge the treated water into the distribution system. The treatment facility has five closed pressure filters used for removal of iron and manganese.

Disinfection is achieved by the use of a sodium hypochlorite system consisting of a solution tank complete with spill containment and protection and two 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 and turbidity. The analyzers are connected with the Mannheim Water Treatment Plant SCADA system which is monitored by an operator 24 hours per day.

There is no emergency stand-by electrical power at this facility.

3. Mannheim Water Treatment Plant

The Mannheim Water Treatment Plant receives raw water from the Hidden Valley Low Lift Station located at the Grand River. 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 ML.

Disinfection is achieved through ozonation, ultraviolet (UV) irradiation followed by chlorination via a gas chlorination system. Continuous analyzers monitor the levels of ozone, chlorine, turbidity, UVT and UV dosage prior to the water being discharged. The analyzers are connected with the Mannheim Water Treatment Plant SCADA system which is monitored by an operator 24 hours per day.

The water from the Mannheim Aquifer Storage and Recovery Facilities (ASR1, ASR2, ASR3, ASR4, RCW1 and RCW2) 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 seven other ground water wells (K91, K92, K93, K94, K21, K25, and K29). Treated water from the Mannheim Village wells (K22A, K23, K24 and 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 ML. Prior to the treated water being pumped into the distribution system, anhydrous ammonia or 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.

4. Parkway Well Supply System

The Parkway Well System is comprised of three ground water wells, K31, K32 and K33. These wells pump directly into the Parkway Reservoir and Pumping Station. The Parkway Reservoir has a capacity of three million imperial gallons (14,000 cubic meters).

Disinfection is achieved by the use of a sodium hypochlorite system consisting of a solution tank complete with spill containment and protection and a metering pump dispensing commercial 12% sodium hypochlorite solution. Ammonium sulphate is added to the water at the discharge header of the pumping station prior to the water leaving the station. The purpose of the ammonium sulphate is to convert free chlorine to the combined form, creating a more stable distribution disinfectant. These chemical systems are located at Parkway Reservoir and Pumping Station.

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Continuous analyzers monitor the levels of chlorine and turbidity prior to the water being discharged. The analyzers are connected with the Mannheim Water Treatment Plant SCADA system which is monitored by an operator 24 hours per day.

This site has no emergency standby power available on site.

5. Strange St. Well Supply System

The Strange Street Water Treatment System is comprised of five ground water wells, K10A, K11A, K13A (Currently out of service), K18 and K19. The wells feed into a 450 mm diameter raw water main to the Strange Street Water Treatment Plant (WTP) located at 25 Strange Street in the City of Kitchener, Ontario. The incoming well field water is injected with Sodium Hypochlorite before feeding into the Pre-Oxidation Tank (total volume: 116 m³). Low Lift Pumps situated in the Pre-Oxidation Tank are used to pump the water to three Iron and Manganese Pressure Filters. Each pressure filter contains 3 filter cells. The filtered effluent water is then injected with Sodium Hypochlorite before entering the Treated Water Reservoir (total volume: 250 m³). 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. Booster Pumps are then utilized to pump water out of the Treated Water Reservoir towards being discharged from the WTP. Before discharging the water, Ammonium sulphate is added to the water downstream of the Booster Pumps. The purpose of the ammonium sulphate is to convert free chlorine to the combined form, creating a more stable distribution disinfectant.

When the Pressure Filters require cleaning, Backwash Supply Pumps feed the Filters with filtered water from The Backwash Supply Tank (total volume: 340 m³). Wastewater from the Backwash Procedure is sent to two Backwash Waste Tanks (total volume: 442m³ each). Solids from inside these Waste Tanks is pumped into a Sludge Tank (total Volume: 84 m³) using two Sludge Pumps. Supernatant Pumps in the Backwash Waste Tanks are used to either recycle the supernatant water back to the Pre-Oxidation Tank or discharge it to a manhole outside the WTP depending on either Recycle or Waste modes.

Continuous analyzers monitor the levels of chlorine and turbidity prior to the water being discharged. The analyzers are connected with the Mannheim Water Treatment Plant SCADA system which is monitored by an operator 24 hours per day.

This site has no emergency standby power available on site.

6. Woolners (K80's) Well Supply System

The Woolners Well Supply system is comprised of three wells: K80, K81, and K82. These wells combine in a common header prior to entering the Ebydale UV Building. The water from the three wells is injected with sodium hypochlorite located in the well houses of K81 and K82. The systems consist of solution tanks complete with spill containment and protection and metering pumps dispensing commercial 12% sodium hypochlorite solution. The water entering the Ebydale UV Building is then passed through an Ultraviolet (UV) system, which provides primary disinfection. Ammonium sulphate is then added to the water at the discharge header prior to the water leaving the station. The purpose of the ammonium sulphate is to convert the free chlorine residual to a more stable combined chlorine residual.

Continuous analyzers monitor the levels of chlorine, turbidity, UVT and UV dosage prior to the water being discharged. The analyzers are connected with the Mannheim Water Treatment Plant SCADA system which is monitored by an operator 24 hours per day.

In November 2019, the well houses and treatment plant buildings were decommissioned and the connection to the Kitchener Distribution System was removed.

There is no emergency standby power available at this site.

Common Fluctuations

There are known seasonal issues with the water supply:

- Summer – increased water usage can result in pressure challenges in some areas of the system
- Fall - Grand River temperature changes may cause odour challenges in the source water, which may increase flushing requirements
- Winter – temperature extremes may cause more watermain breaks in the system

Risk Assessment Procedures and Outcomes

The Risk Assessment Procedure is provided in the Appendix.

The Risk Assessment Table shows the identified hazards and hazardous events, ranked risks, control measures, and reference to monitoring and response procedures.

The Critical Control Points identified in the Risk Assessment are:

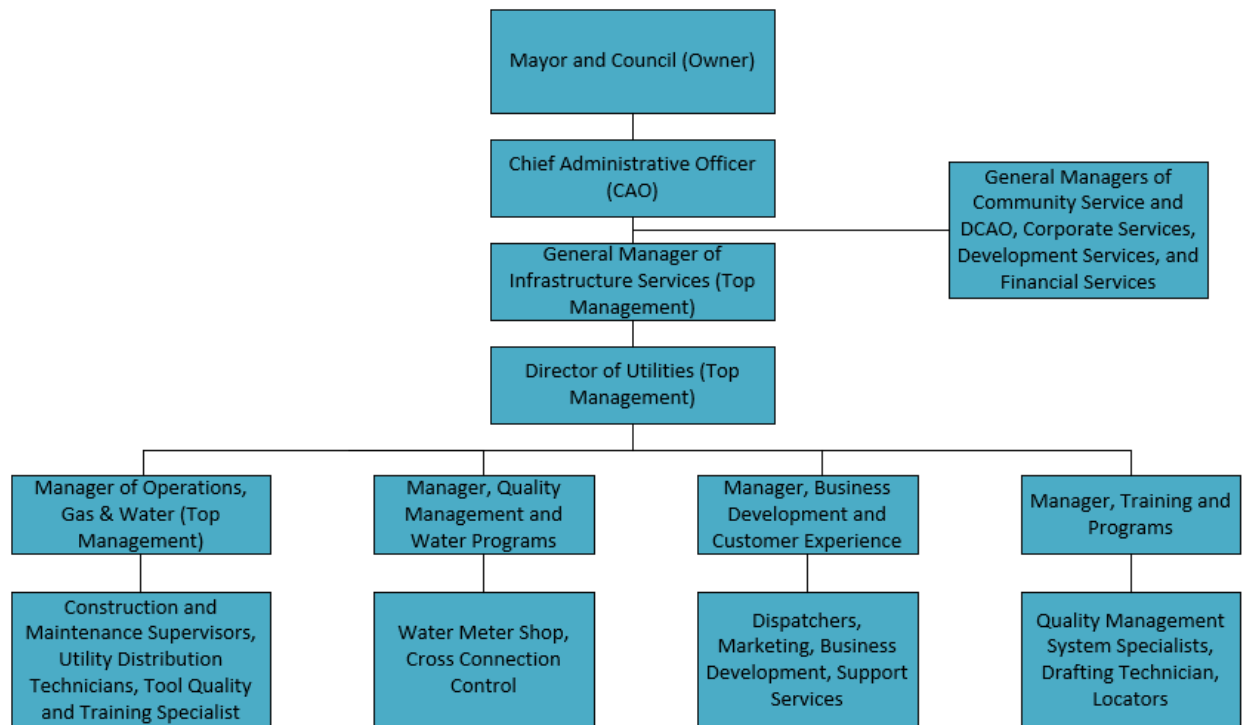
- Asset operation and maintenance:
 - to reduce water adverses
 - to reduce backflow / siphonage hazards including water chambers full of water with air relief valves

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- to reduce chambers full of water with air relief valves
- to reduce valves accidentally left closed after watermain cleaning

Organizational Structure, Roles, Responsibilities and Authorities

A basic overall organization chart is shown below. A detailed Organizational Chart that includes all key waterworks staff is provided in the Appendix. A list of backup or designated contacts in case of absence is available on the Kitchener Utilities Important Numbers List.



Key waterworks roles are listed as follows, with associated responsibilities and authorities. This information is communicated to staff as per the Communication Procedure.

<i>Role</i>	<i>Responsibilities*</i>	<i>Authorities</i>
City of Kitchener Council and Mayor (Owner)	<ul style="list-style-type: none"> • Prescribe requirements and monitor operations of the waterworks • Provide resources and system infrastructure, as necessary • Represent the waterworks to end users and the public 	<ul style="list-style-type: none"> • Prescribe requirements and obligations for the operation of the waterworks • Ensure a continual supply of safe drinking water • Provide resources and system infrastructure, as necessary • Designate responsibilities as appropriate

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<i>Role</i>	<i>Responsibilities*</i>	<i>Authorities</i>
General Manager, Infrastructure Services (Top Management)	<ul style="list-style-type: none"> • Obtain and provide resources as required for operation of the waterworks • Attend meetings with Council and senior leadership teams • Report issues to the CAO and Council, as necessary • Participate in Management Review • Member of Emergency Operations Centre Management Team 	<ul style="list-style-type: none"> • Approval of hiring of all waterworks personnel • On-Warn Assistance declaration
Director, Gas and Water Utilities (Top Management)	<ul style="list-style-type: none"> • Responsible for the day-to-day leadership and operation of the Utilities division. Develops and implements Utilities programs, policies, budgets, rates, and strategies that are aligned with Council's priorities and corporate strategic direction and Regulatory requirement. Accountable for ensuring regulatory compliance • Supervises Utilities Managers • Overall responsibility for the operation of the waterworks • Attend meetings with Council as required • Ensure QMS is in place • Ensure Operating Authority staff are aware of applicable legislation • Determine, obtain and provide resources required for QMS • Report issues to the General Manager Infrastructure Services, as necessary • Participate in Management Review • Designates On-Call Manager as per On-call Schedule • Declares Emergency exemptions for Hours of Service (MTO), or designate 	<ul style="list-style-type: none"> • Allocation of provided resources • Administration of labour agreement(s) • Oversees utilities water assets • Monitors expenditures, expenses and controls costs through the budget year to ensure high levels of financial, operational and service integrity on a day-to-day basis • Recommends rate structures for water • Designate responsibilities as required
Manager, Operations (Gas and Water) (Top Management)	<ul style="list-style-type: none"> • Manages the safe and reliable distribution of water • Maintain regulatory compliance • Supervise Construction and Maintenance Supervisors • Schedule work assignments • Work safety program • Reporting of deviation from critical limits to the Manager of Quality Management & Water Programs, appropriate • Report issues to the Director of Utilities as necessary • Hire waterworks personnel 	<ul style="list-style-type: none"> • Direct supervisors and staff • Develop/improve departmental practices • Designate responsibilities as required

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<i>Role</i>	<i>Responsibilities*</i>	<i>Authorities</i>
	<ul style="list-style-type: none"> • Determine, obtain and provide resources required for Operations • Participate in Management Review • Develops On-call schedule and designates ORO as per On-call Schedule • Response to deviations, as required 	
Supervisor, Utilities	<ul style="list-style-type: none"> • Supervise Utilities Construction & Maintenance staff in the daily operation of the City's water system; to respond to and direct staff during water emergencies. • Reporting of deviation from critical limits to the Manager of Operations, as appropriate • Overall Responsible Operator (ORO) when on-call • OIC when not on-call • Response to deviations, as required • One Supervisor is designated to support training and complete training on equipment 	<ul style="list-style-type: none"> • Direct staff in day-to-day operations and maintenance activities • Schedule construction activities as they affect operations • Recommend to the Manager of Operations ways to improve operational effectiveness • Designate responsibilities as required
Manager, Training and Programs	<ul style="list-style-type: none"> • Reporting of deviation from critical limits to the Manager of Operations, as appropriate • Manages QMS Specialist, Locator and Drafting Technician • Responsible for organizing maintaining all training needs for staff directly affecting drinking water quality • Training and development • Backup for the Manager, Quality Management and Water Programs • Participates in Top Management Review • Maintain Utilities Training Matrix 	<ul style="list-style-type: none"> • Recommend to the Manager of Operations ways to improve operational effectiveness • Designate responsibilities as required • Ensure training of supervisors and Construction and Maintenance staff meets requirements

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<i>Role</i>	<i>Responsibilities*</i>	<i>Authorities</i>
Manager, Quality Management and Water Programs – Designated as QMS Representative	<ul style="list-style-type: none"> Ensures the distribution of a safe supply of drinking water to customers, including meeting regulatory requirements, developing related standards and enforcement Perform specified duties as per training and/or direction of superiors Maintain operational parameters of the waterworks Prepare Annual Regulatory Reports, Management Reviews and communication to Top Management Prepare and present reports to council Represent the waterworks in communication with the RMOW Compiling/Reporting waterworks performance operations data to council Review and Approval of Form 1 includes review of Construction drawings for new construction/ reconstruction Review and approval of commissioning plans Review of water quality reports and approval to connect Communicate QMS as per communication Monitor water quality & demand Ensure Operating Authority are aware of applicable legislation Supervises Cross Connection group and Water Meter Shop Preparation and provision of training as related to QMS Communicates to operations/supervisors for water quality related response Preparation of budget documents as related to QMS, Capital works Supports continual improvement Sits on Regional Best Management Practices committees for standard development <p>Designates for this position (portions) may be:</p> <ul style="list-style-type: none"> Manager, Training and Programs On-Call Manager QMS Specialist 	<ul style="list-style-type: none"> Designate responsibilities as appropriate Arrange for corrective actions for water quality adverse Completes reporting for adverses Report of adverse water quality incidences to Top Management
On Call Manager	<ul style="list-style-type: none"> Perform back-up to the Manager, Quality Management and Water Programs for specific water quality related items requiring immediate response Declares emergency for Hours of Service MTO 	<ul style="list-style-type: none"> Same as Manager, Quality Management and Water Programs

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<i>Role</i>	<i>Responsibilities*</i>	<i>Authorities</i>
Construction and Maintenance Staff – Utilities Distribution Technician or Operator-in Training	<ul style="list-style-type: none"> • Perform specified duties as per training/work instructions/procedures and/or direction of superiors • Complete all paperwork/supplemental work orders – Cityworks and associated paperwork are considered to be MECP regulatory requirements • Maintain operational parameters of the waterworks • Maintain and repair equipment where qualified • All staff must maintain Internal Responsibility System (Safety as per Occupational Health and Safety Act) 	<ul style="list-style-type: none"> • Operate and maintain the waterworks under direction of OIC/ORO/Manager
Construction and Maintenance Staff - Utilities Staff – Utility Crew Leader/Temporary Crew Leader	<ul style="list-style-type: none"> • The OIC is the Crew Leader or the Temporary Crew Leader • Constructor's representative, all duties associated with Ministry of Labour requirements • Duties as outlined in Utilities Staff – Utilities Distribution Technician • Rotation on 263 Emergency Response Vehicle – secondary response • Complete all paperwork/supplemental work orders – Cityworks and associated paperwork are considered to be MECP regulatory requirements • Perform all regulatory requirements of an OIC 	<ul style="list-style-type: none"> • Direct crews • Enforce all applicable Ontario Regulations (MECP, MOL) • Enforce all applicable City policies
Construction and Maintenance Staff - Tool Quality Support and Training Specialist	<ul style="list-style-type: none"> • Maintain and repair equipment and Owner's/Manufacturer's manuals • Ensure equipment is in good working order • Verification/Calibration of equipment • Training staff on equipment use • Maintenance of equipment/sign-out logs 	<ul style="list-style-type: none"> • Purchase equipment/supplies • Maintain tools/equipment in accordance with manufacturer specs • Contacting suppliers/manufacturers/calibration companies
Utilities Assistant and Operational Services Support Person	<ul style="list-style-type: none"> • Support operational/construction related activities including scheduling, follow-up, invoicing, communication • Creation of work orders 	
Cross Connection Control Specialist	<ul style="list-style-type: none"> • Implements, administers and enforces the Cross Connection Control/Backflow Prevention By-law • Inspection of new devices 	<ul style="list-style-type: none"> • Determine hazards and appropriate device selection • Commencement of enforcement activities (e.g. fines, water shut-off) in consultation with superiors

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<i>Role</i>	<i>Responsibilities*</i>	<i>Authorities</i>
Manager, Business Development and Customer Experience	<ul style="list-style-type: none"> Provides leadership and direction to Dispatch staff/marketing staff Manages the collection and reporting of information regarding citizen inquiries, complaints Oversees marketing, communications and branding strategies to ensure consistent messaging 	<ul style="list-style-type: none"> Develops operating procedures, policies, manuals and training related to customer service
Dispatcher	<ul style="list-style-type: none"> Receive and process incoming calls from the public and internal staff for general inquiries, appointments, complaints and emergencies Dispatch Construction & Maintenance Staff Provides general information and direction on the services, procedures, practices, policies and programs provided by the City through public and internal inquirers 	<ul style="list-style-type: none"> Follows established procedures and makes calm decisions as required in an emergency services environment Deploy resources, as required Refers escalated issues to the supervisor and/or on-call manager, when applicable
QMS Representative – designated as Manager-Quality Management and Water Programs	<ul style="list-style-type: none"> Develop, implement and maintain the QMS Report on the performance of the QMS to Top Management Identify needs for improvement in the QMS Ensure that the current versions of documents required by the QMS are in use at all times Ensure that all personnel are aware of all applicable legislative requirements that are relevant to the operation of the works Stay up to date on changes to relevant legislative and regulatory requirements Promote the QMS throughout the Operating Authority 	<ul style="list-style-type: none"> Delegate duties as necessary
QMS Specialist	<ul style="list-style-type: none"> Manages the development, implementation and maintenance of the DWQMS Develop, implement and maintain the QMS Identify needs for improvement in the QMS Ensure that the current versions of documents required by the QMS are in use at all times Ensure that all personnel are aware of all applicable legislative requirements that are relevant to the operation of the works Promote the QMS throughout the Operating Authority Assists with the preparation of water quality related reports Prepares and submits data for benchmarking Review of water quality data Review of water quality tests and provides approval to connect 	<ul style="list-style-type: none"> Delegate duties as necessary Arrange for corrective actions for adverse water Completes reporting for adverses

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<i>Role</i>	<i>Responsibilities*</i>	<i>Authorities</i>
Drafting Technician	<ul style="list-style-type: none"> • Processing records for operational staff (e.g. valve replacements) • Updating/correcting attribute info • Completing/processing records for engineering related record changes • Map tentative as-built watermain based on red-line 	<ul style="list-style-type: none"> • Record changes
<p>* Job duties are as related to the DWQMS, detailed job descriptions are developed in conjunction with Human Resources for CUPE 791 and non-union management staff. Job postings may include additional information.</p>		
<p>Additional Resources Outside of Kitchener Utilities</p> <p>Engineering – Development Engineering, Engineering Design and Approvals and Building, Engineering Construction - design, construction and inspection of new installation and reconstruction of watermain as well as provision of as-builts</p> <p>Technology Innovation and Services- mapping as-builts and maintenance of GIS system and maps</p> <p>Asset Management and Business Solutions – develops the annual 10 year Road & Utility Capital Forecast using water asset condition information developed via the Infrastructure Maintenance, Rehabilitation and Renewal procedure.</p> <p>Corporate Contact Centre (CCC) – some Dispatch duties after hours</p>		

Competencies

The Competencies Procedure describes the process for identifying, developing and maintaining required competencies for personnel performing duties directly affecting drinking water quality. The procedure also describes activities to ensure personnel are aware of the relevance of their duties.

Records show evidence of activities to meet and maintain the competencies described in the procedure, and to ensure personnel awareness. The Procedure is provided in the Appendix.

Personnel Coverage

The Personnel Coverage Procedure describes the process for ensuring personnel are available for duties. The Procedure is provided in the Appendix.

Communications

The Communications Procedure describes the process for ensuring relevant aspects of the QMS are communicated between Top Management and the Owner, waterworks personnel, suppliers and the public. The Procedure is provided in the Appendix.

Essential Supplies and Services

The 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. The Procedure is provided in the Appendix.

Infrastructure Review and Provision

The Infrastructure Review Procedure describes the process for the review of the infrastructure adequacy. This Procedure is provided in the Appendix. The procedure also describes the provision of infrastructure, and the communication of review findings to the Owner. The Procedure is provided in the Appendix.

Infrastructure Maintenance, Rehabilitation and Renewal

The Infrastructure Maintenance, Rehabilitation and Renewal Procedure describes the maintenance programs undertaken by Kitchener Utilities, and how the system is rehabilitated and renewed. The Procedure is provided in the Appendix.

Sampling, Testing, and Monitoring

The Sampling, Testing and Monitoring Procedure describes procedures used to maintain chlorine residual in the Distribution System by sampling, testing and monitoring at the waterworks. Maintenance programs including dead end main flushing and new development flushing maintain chlorine residuals within the distribution system. The procedure outlines requirements for bacteriological testing within the distribution system, including temporary watermain. Additional sampling requirements as per regulatory requirements are also included in the procedure (see Appendix).

Calibration

The Calibration Procedure describes procedures for maintenance and calibration of measurement and recording equipment. The Procedure is provided in the Appendix.

Emergency Management

An emergency is considered to be a potential situation or service interruption that may result in the loss of the ability to maintain a supply of safe drinking water to consumers.

The Emergency Management procedure describes the process of maintaining a state of emergency preparedness at the waterworks. It refers to applicable emergency response procedures. The procedure is provided in Appendix.

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Internal Audits

The Internal Audits Procedure describes the procedure for internal audits, including audit criteria, frequency, scope, records, methodology and schedule. The Corrective Action Procedure describes the process of initiating, investigating, performing and documenting corrective actions. Both procedures are provided in the Appendix.

Management Review

The Management Review Procedure describes the procedure for management review, including review items, reviewers, outcomes, and documentation. The Procedure is provided in the Appendix.

Continual Improvement

Kitchener Utilities strives to continually improve the effectiveness of its QMS through the use of corrective actions, especially from the annual internal audits (as per the Internal Audit Procedure), staff suggestions and management reviews (as per the Management Review Procedure). The procedure can be found in the Appendix.

History of Changes

Revision	Date	Description	By
24.0	January 30, 2019	Updating infrastructure summary, deleting outdated information.	Steve Young
25.0	September 30, 2019	Filing of approval of QMS Rep, new element 15 procedure, updating job titles	Steve Young
26.0	March 5, 2020	Update of Drinking Water Distribution System section and other sections as a result of the Kitchener Utilities Re-org.	Dean Chapman
27.0	April 17, 2020	Updated Description of Water Source section to be consistent Region of Waterloo's Water Quality Report.	Ras Sonthisay
28.0	March 3, 2021	Updates to the Drinking Water Distribution System section.	Dean Chapman
29.0	January 12, 2022	Updates to the Drinking Water Distribution System stats and Strange St Well Supply system.	Dean Chapman

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30.0	September 29, 2022	Primary response vehicle added to definitions section.	Angela Mick
31.0	January 10, 2023	Updates to the Drinking Water Distribution System and Sampling, Testing and Monitoring sections.	Angela Mick, Dean Chapman

City of Kitchener Water Distribution DWQMS Operational Plan

SUBJECT SYSTEM DESCRIPTION FORM

[Print Form](#)



Ministry of the Environment
and Climate Change

Schedule C – Director's Directions for Operational Plans (Subject System Description Form) Municipal Residential Drinking Water System

Fields marked with an asterisk (*) are mandatory.

Owner of Municipal Residential Drinking Water System *

[The Corporation of the City of Kitchener](#)

Name of Municipal Residential Drinking Water System *

[Kitchener Distribution System](#)

Subject Systems

☒ Check here if the Municipal Residential Drinking Water System is operated by one operating authority. Enter the name of the operating authority in the below table.

	Name of Operational Subsystems(if Applicable)	Name of Operating Authority *	DWS Number(s) *
1		City of Kitchener	260001458

[Add item \(+\)](#)

Provide the information outlined in the 'Contact Information' section for each Operational Subsystem.

Contact Information

[Remove](#)

Last Name *

[Mick](#)

First Name *

[Angela](#)

Middle Initial

[L](#)

Title *

[Utilities Water Engineer](#)

Phone Number *

[519 741-2600](#)

Email Address *

[angela.mick@kitchener.ca](#)

[Add item \(+\)](#)

[Save Form](#)

[Print Completed Form](#)

[Clear Form](#)

APPENDICES

WATER DISTRIBUTION SYSTEM MAP

- Appendix 1 Endorsement
- Appendix 2 [Document Control Procedure](#)
- Appendix 3 [Record Control Procedure](#)
- Appendix 4a [Risk Assessment Procedure](#)
- Appendix 4b Risk Assessment Table
- Appendix 5 [Critical Control Point Procedure](#)
- Appendix 6a [Current Position/Employee List](#)
- Appendix 6b Organizational Chart
- Appendix 6c [Construction and Maintenance Staff](#)
- Appendix 7 [Competencies Procedure](#)
- Appendix 8 [Personnel Coverage Procedure](#)
- Appendix 9 [Communications Procedure](#)
- Appendix 10 [Essential Supplies and Services Procedure](#)
- Appendix 11 [Review and Provision of Infrastructure Procedure](#)
- Appendix 12 [Sampling, Testing and Monitoring Procedure](#)
- Appendix 13 [Emergency Management Procedure](#)
- Appendix 14 [Maintenance and Calibration of Measuring & Recording Equipment Procedure](#)
- Appendix 15 [Internal Audits Procedure](#)
- Appendix 16 [Corrective Action Procedure](#)
- Appendix 17 [Management Review Procedure](#)
- Appendix 18 [Continual Improvement Procedure](#)
- Appendix 19 [Infrastructure Maintenance, Rehabilitation and Renewal Procedure](#)
- Appendix 20 Drinking Water Works Permit