ONTARIO CLEAN WATER AGENCY
AGENCE ONTARIENNE DES EAUX

OPERATIONAL PLAN

For the Huron-Kinloss Drinking Water Systems

This Operational Plan is designed for the exclusive use of the system(s) specified in this Operational Plan.

This Operational Plan has been developed with OCWA's operating practices in mind and utilizing OCWA personnel to implement it.

Any use which a third party makes of this Operational Plan, or any part thereof, or any reliance on or decisions made based on information within it, is the responsibility of such third parties. OCWA accepts no responsibility for damages, if any, suffered by any third party as a result of decisions made or actions taken based on this Operational Plan or any part thereof.

QEMS

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Reviewed by: QEMS Representative | Approved by: Operations Management

1. Purpose

To document OCWA's Quality & Environmental Management System (QEMS). This Operational Plan defines and documents the QEMS for the Huron-Kinloss Drinking Water Systems operated by the Ontario Clean Water Agency (OCWA). It sets out the OCWA's policies and procedures with respect to quality and environmental management in accordance with the requirements of Ontario's Drinking Water Quality Management Standard (DWQMS).

2. Definitions

Drinking Water Quality Management Standard (DWQMS) – has the same meaning as Quality Management Standard for Drinking Water Systems approved under section 21 of the Safe Drinking Water Act (SDWA).

Operational Plan – means the operational plan required by the Director's Direction.

Quality & Environmental Management System (QEMS) – a system to:
a) Establish policy and objectives, and to achieve those objectives; and
b) Direct and control an organization with regard to quality.

Ministry - means the Ontario government ministry responsible for the administration of the SDWA.

3. Procedure

3.1 OCWA is the contracted Operating Authority for the Huron-Kinloss Drinking Water Systems which includes the following facilities:

- Lakeshore Drinking Water System;
- Lucknow Drinking Water System;
- Ripley Drinking Water System;
- Whitechurch Drinking Water System.

3.2 OCWA's Quality & Environmental Management System (QEMS) is structured and documented with the purpose of:

1. Establishing policy and objectives with respect to the effective management and operation of water/wastewater facilities;
2. Understanding and controlling the risks associated with the facility's activities and processes;
3. Achieving continual improvement of the QEMS and the facility's performance.

3.3 The Operational Plan for the facilities listed above fulfils the requirements of Ontario's DWQMS. The 21 QEMS Procedures within this Operational Plan align with the 21 elements of the DWQMS.

4. Related Documents

Ontario's Drinking Water Quality Management Standard, as amended from time to time
All QEMS Procedures and Documents referenced in this Operational Plan

5. Revision History

Date	Revision #	Reason for Revision
2024-11-18	0	Procedure issued

QUALITY & ENVIRONMENTAL MANAGEMENT SYSTEM (QEMS) POLICY

Reviewed by: QEMS Representative	Approved by: Operations Management

1. Purpose

To document a QEMS Policy that provides the foundation for OCWA's Quality & Environmental Management System.

2. Definitions

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

3. Procedure

3.1 The Ontario Clean Water Agency, its Board of Directors, Officers and entire staff are committed to the principles and objectives set out in our QEMS Policy.

OCWA's Policy is to:

- Deliver safe water and wastewater services that protect public health, the environment, and the sustainability of communities.
- Comply with applicable legislation and regulations.
- Promote client, consumer and stakeholder confidence through service excellence, effective communications and reporting.
- Train staff on their QEMS responsibilities.
- Maintain and continually improve the QEMS.

Originally issued as Environmental Policy on June 8, 1995
Last revised, approved by OCWA's Board of Directors on April 4, 2024
(This policy is annually reviewed)

3.2 Our Board of Directors, Officers and entire staff will act to ensure the implementation of this Policy and will monitor progress of the Quality & Environmental Management System (QEMS).

3.3 OCWA's QEMS Policy is readily communicated and available to all OCWA personnel, through OCWA's intranet. The Owner and members of the public can access the policy through OCWA's public website (www.ocwa.com). A hardcopy of the QEMS Policy is posted as specified in the OP-05 Document and Records Control procedure.

3.4 Essential suppliers and service providers are advised of OCWA's QEMS Policy as per the OP-13 Essential Supplies and Services procedure.

3.5 Corporate Compliance coordinates the annual review and approval of the QEMS Policy by the Board of Directors and communicates the approval to all OCWA employees via an electronic communication.

3.6 The current version of the policy indicates the date of the last revision and that the policy is annually reviewed. Electronic and hard-copy documents that include the QEMS Policy will only be required to be updated in years when the Policy has been revised. A complete review/revision history of the QEMS Policy (documenting the annual policy review and/or revision approval date) is accessible to all staff on OCWA's intranet and is available upon request for external stakeholders.

4. Related Documents

Current QEMS Policy (Posted on OCWA's intranet and internet)
QEMS Policy Revision History (Posted on OCWA's intranet)
OP-05 Document and Records Control
OP-13 Essential Supplies and Services

5. Revision History

Date	Revision #	Reason for Revision
2024-11-18	0	Procedure issued

COMMITMENT AND ENDORSEMENT

Reviewed by: QEMS Representative	Approved by: Operations Management

1. Purpose

To document the endorsement of the Operational Plan for the Township of Huron-Kinloss Drinking Water Systems by OCWA Top Management and the Township of Huron-Kinloss (Owner) and to set out when re-endorsement would be required.

2. Definitions

Top Management – a person, persons or a group of people at the highest management level within an Operating Authority that makes decisions respecting the QMS and recommendations to the Owner respecting the Subject System or Subject Systems

3. Procedure

3.1 The Operational Plan is provided to OCWA Top Management and to the Owner for endorsement. The signed written endorsement is presented in Appendix OP-03A. At a minimum, two members of Top Management must endorse the Operational Plan; however, the Operational Plan is made available to all members of Top Management in the specified document control location (refer to OP-05 Document and Records Control). Endorsement by OCWA's Top Management is represented by Senior Operations Manager and Safety, Process and Compliance Manager.

3.2 Any major revision of the operational plan will be re-endorsed by OCWA Top Management and the Owner. Major revisions include:

1. A revision to OCWA's QEMS Policy;
2. A change to both representatives of the facility's Top Management and/or both of the Owner's representatives that endorsed the Operational Plan;
3. A modification to the drinking water system processes/components that would require a change to the description in OP-06 Drinking Water System;
4. The addition of a drinking water subsystem owned by the same Owner to this operational plan.

Any other changes would be considered a minor change and would not require the Operational Plan to be re-endorsed.

4. Related Documents

OP-03A Signed Commitment and Endorsement
OP-05 Document and Records Control
OP-06 Drinking Water System

5. Revision History

Date	Revision #	Reason for Revision
2024-11-18	0	Procedure issued

QEMS Ontario Clean Water Agency	**OPERATIONAL PLAN** Township of Huron-Kinloss Drinking Water Systems	QEMS Doc: OP-03A Rev Date: 2024-11-18 Rev No: 0 Pages: 1 of 1

SIGNED COMMITMENT AND ENDORSEMENT

This Operational Plan sets out the framework for OCWA's Quality & Environmental Management System (QEMS) that is specific and relevant to your drinking water systems and supports the overall goal of OCWA and the Township of Huron-Kinloss (Owner) to provide safe, cost-effective drinking water through sustained cooperation. OCWA will be responsible for developing, implementing, maintaining and continually improving its QEMS with respect to the operation and maintenance of the Township of Huron-Kinloss Drinking Water Systems and will do so in a manner that ensures compliance with applicable legislative and regulatory requirements.

Through the endorsement of this Operational Plan, the Owner commits to work with OCWA to facilitate this goal.

OCWA Top Management Endorsement

Paul Sherban
Senior Operations Manager,
Bluewater/Lucan Cluster

Nov 18/24
Date

Cindy Sigurdson
Safety, Process and Compliance Manager
Midwest Region

Nov 18/24
Date

Owner Endorsement

Jodi MacArthur
Chief Administrative Office

Nov 25/24
Date

John Yungblut
Director of Public Works

Nov. 25/24
Date

The endorsement above is based on the Operational Plan that was current as of the revision date of this document (OP-03A).

QUALITY & ENVIRONMENTAL MANAGEMENT SYSTEM (QEMS) REPRESENTATIVE

Reviewed by: QEMS Representative	Approved by: Operations Management

1. Purpose

To identify and describe the specific roles and responsibilities of the QEMS Representative(s) for the Township of Huron-Kinloss Drinking Water Systems.

2. Definitions

None

3. Procedure

3.1 The role of QEMS Representative for the Township of Huron-Kinloss Drinking Water Systems is the Process and Compliance Technician. The Safety, Process and Compliance Manager (or alternate PCT) will act as an alternate QEMS Representative when required.

3.2 The QEMS Representative is responsible for:

- Administering the QEMS for the Township of Huron-Kinloss Drinking Water Systems by ensuring that processes and procedures needed for the facility's QEMS are established and maintained;
- Reporting to Top Management on the facility's QEMS performance and identifying opportunities for improvement;
- Ensuring that current versions of documents related to the QEMS are in use;
- Promoting awareness of the QEMS to all operations personnel; and
- In conjunction with Top Management, ensuring that operations personnel are aware of all applicable legislative and regulatory requirements that pertain to their duties for the operation of the system.

4. Related Documents

None

5. Revision History

Date	Revision #	Reason for Revision
2024-11-18	0	Procedure issued

DOCUMENT AND RECORDS CONTROL

Reviewed by: QEMS Representative	Approved by: Operations Management

1. Purpose

To describe how OCWA's QEMS documents are kept current and how QEMS documents and records are kept legible, readily identifiable, retrievable, stored, protected, retained and disposed of. Applies to QEMS Documents and QEMS records pertaining to the Huron-Kinloss Drinking Water Systems, as identified in this procedure.

2. Definitions

Document – includes a sound recording, video tape, film, photograph, chart, graph, map, plan, survey, book of account, and information recorded or stored by means of any device

Record – a document stating results achieved or providing proof of activities performed

QEMS Document – any document required by OCWA's QEMS as identified in this procedure

QEMS Record – any record required by OCWA's QEMS as identified in this procedure

Controlled – managed as per the conditions of this procedure

Retention Period – length of time that a document or record must be kept; starts from the date of issue for QEMS records or from the point of time when a QEMS document is replaced by a new or amended document

3. Procedure

3.1 Documents and records required by OCWA's QEMS and their locations are listed in Appendix OP-05A Document and Records Control Locations.

3.2 Internally developed QEMS documents and QEMS records (whenever possible) are generated electronically to ensure legibility and are identified through a header/title and revision date. Handwritten records must be legible and permanently rendered in ink or non-erasable marker.

3.3 Controls for the Operational Plan include the use of an authorized approval and a header on every page that includes a title, alpha-numeric procedure code, revision date, revision number and page numbers. A revision history is also included at the end of each procedure.

The authorized personnel responsible for the review and approval of this Operational Plan are:

Review	QEMS Representative
Approval	Operations Management

The QEMS Representative ensures that updated documents are provided to the above authorized personnel for review or approval prior to issuance.

Authorized personnel authenticate their review/approval of this Operational Plan by using email confirmations.

3.4 The QEMS Representative is responsible for ensuring that current versions of QEMS documents are being used at all times. Current QEMS documents and records are readily accessible to operations personnel and to internal and external auditors/inspectors at established document control locations. The currency of internal documents is ensured by comparing the date on the document to that of the master hardcopy and/or electronic copy residing in the designated document control location(s) specified in Appendix OP-05A.

Document control locations are established in areas that provide adequate protection to prevent unauthorized use/access, damage, deterioration or loss of QEMS documents and records. Copies of QEMS documents and records located outside of designated control locations are considered uncontrolled.

3.5 Access to OCWA's computer network infrastructure is restricted through use of individually-assigned usernames and passwords and local area servers. Network security is maintained by OCWA's Information Technology department through a number of established mechanisms and practices such as daily back-up of files stored on servers, password expiry, limitations on login attempts, multi-factor authentication and policies outlining specific conditions of use.

Access to facility QEMS records contained within internal electronic databases and applications (e.g., OPEX, PDM, WMS) is administered by designated application managers/trustees, requires the permission of Operations Management and is restricted through use of usernames and passwords. Records are protected by means of regular network back-ups of electronic files stored on servers and/or within databases.

SCADA records are maintained as per Appendix OP-05A and are accessible to all staff when required.

3.6 Any employee of the drinking water system may request to the QEMS Representative, a revision be made to improve an existing internal QEMS document or the preparation of a new document. Written requests should indicate the reason for the requested change. The need for new or updated documents may also be identified through the Management Review or system audits.

The QEMS Representative communicates any changes made to QEMS documents to relevant operations personnel and coordinates related training (as required). Changes to corporately controlled QEMS documents are communicated and distributed to facility QEMS Representatives by OCWA's Corporate Compliance Group through e-mails, memos and/or provincial, regional hub/cluster or facility-level training sessions.

3.7 When a QEMS document is superseded, the hardcopy and the electronic copy of the document (as applicable) are promptly removed from the applicable designated document control locations specified in OP-05A. The QEMS Representative ensures that the hardcopy and electronic copy are disposed of or retained (as appropriate).

3.8 The authorized method for disposal of hardcopy documents and records after the specified retention requirements have been met is shredding.

The authorized method for disposal of electronic documents and records after the specified retention requirements have been met is deleting.

3.9 QEMS documents and records are retained in accordance with applicable regulations and legal instruments. Relevant regulatory and corporate minimum retention periods are as follows:

Type of Document/Record	Minimum Retention Time	Requirement Reference
Operational Plan (OP-01 to OP-21 and appendices, including Schedule "C" – Subject System Description Form) FEP Long term forecast of major infrastructure maintenance, rehabilitation and renewal activities Sampling plan/schedule/ calendar	10 years	Director's Direction under SDWA
Internal QEMS Audit Results	10 years	OCWA Requirement
External QEMS Audit Results	10 years	OCWA Requirement
Management Review Documentation	10 years	OCWA Requirement
Documents/records required to demonstrate conformance with the DWQMS (specifically documents/records listed in OP-05A)	3 years*if no specified legislative requirement identified in this table or in the facility's legal instruments *	OCWA Requirement
Log Books or other record-keeping mechanisms	5 years	O. Reg. 128/04
Training Records for water operators and water quality analysts	5 years	O. Reg. 128/04
Operational checks, sampling and testing (e.g., chlorine residuals, turbidity, fluoride, sampling records), microbiological sampling and testing and chain of custodies	2 years	O. Reg. 170/03
Schedule 23 & 24 sampling, chain of custodies and test results	6 years LMR 15 years SMR	O. Reg. 170.03

Type of Document/Record	Minimum Retention Time	Requirement Reference
THM, HAA, nitrates, nitrites and lead program (including pH and alkalinity) sampling, chain of custodies, and test results, Section 11 Annual Reports and Schedule 22 Summary Reports	6 years	O. Reg. 170/03
Sodium sampling, chain of custody and test results and related corrective action records/reports, 60 month fluoride sampling, chain of custody and test results (if the system doesn't fluoridate), Engineering Reports, GUDI/Non-GUDI Reports	15 years	O. Reg. 170/03
Corrective action records/reports for E. Coli, Total Coliforms and bacterial species	2 years	O. Reg. 170/03
Corrective action records/reports for chemical and radiological parameters under SDWA O. Reg. 169/03, pesticides not listed under O. Reg. 169/03 and health-related parameters in an order or approval	6 years LMR 15 years SMR	O. Reg. 170/03
Flow Meter Calibration Records, Analyzer Calibration Reports Maintenance Records/Work Orders	2 years	O. Reg. 170/03
Records required by or created in accordance with the Municipal Drinking Water Licence (MDWL) or Drinking Water Works Permit (DWWP). Except records specifically referenced in O. Reg. 170/03 or otherwise specified in the MDWL or DWWP.	5 years	MDWL
Ministry forms referenced in the DWWP, including Form 1, Form 2, Form 3 and Director Notifications (applies to forms that have been completed by OCWA as the authorized by the owner)	10 years	DWWP

3.10 The Operational Plan is reviewed for currency by the QEMS Representative during internal/external audit and Management Review processes. Other QEMS-related documents are reviewed as per the frequencies set out in this Operational Plan or as significant changes (e.g., changes in regulatory requirements, corporate policies or operational processes and/or equipment, etc.) occur. QEMS documents and records are reviewed for evidence of control during each internal system audit as per OP-19 Internal QEMS Audits.

4. Related Documents

OP-05A Document and Records Control Locations

OP-19 Internal QEMS Audits
OP-20 Management Review Minutes

5. Revision History

Date	Revision #	Reason for Revision
2025-03-31	0	Procedure issued

DOCUMENT AND RECORDS CONTROL LOCATIONS

Reviewed by: QEMS Representative | Approved by: Operations Management

Designated locations for documents and records required by OCWA's QEMS

DRCC-Document and Records Control Centre (location specified in Table)

HC location- HK Cluster Office 592 Willoughby St, Lucknow ON

Type of Document/Record	Designated Document Control Location (HC = Hardcopy, E = Electronic)
Internal QEMS Documents	
Operational Plan (OP-01 to OP-21)	E – Operational Plan
Schedule "C" – Subject System Description Form	E- Schedule C
QEMS Policy	E - OCWA's Sharepoint site and public website HC - HK Cluster Office
Facility Emergency Plans	E- FEP
Corporate Emergency Response Plan (CERP)	E - OCWA's Sharepoint site
Standard Operating Procedures (referenced in Operational Plan and QEMS Procedures)	E- Huron-Kinloss Drinking Water Systems
Essential Supplies & Services List	E- HK FEP Emergency Contacts ESS Huron Kinloss Water.pdf
Shift/Vacation Schedule	Outlook Calendar
On-call Schedule	E- HK On Call Schedule 2025 HC - HK Cluster Office
ORO Schedule	E- 2025 Huron Kinloss ORO Schedule HC – HK Cluster Office
Round Sheet Form	E-Round Sheets and Forms
Sampling Schedule/Plan/Calendar	E-Sample Schedules
Chain of Custody Forms	E-Chain of Custody
Community Complaint Form	E- Community Complaint Form
External QEMS Documents	
Maintenance/equipment manuals	HC – at each station
Distribution System Drawings	E-HK Distribution Maps
Engineering System schematics/plans/drawings/ diagrams	HC – at each station

DOCUMENT AND RECORDS CONTROL LOCATIONS

Reviewed by: QEMS Representative	Approved by: Operations Management

Type of Document/Record	Designated Document Control Location (HC = Hardcopy, E = Electronic)
Municipal Drinking Water License	E-MDWL
Drinking Water Works Permit	E-DWWP
Permit to Take Water	E-PTTW
Operator certificates	E-Operator Certificates HC- HK Cluster Office
AWWA Standards	E - \\Torwan\PCT\AWWA Standards
Ontario's Watermain Disinfection Procedure	E – https:www.ontario.ca
DWQMS Standard	E - https://www.ontario.ca
ANSI/NSF product registration documentation for Chemicals/Materials Used	E-https://www.nsf.org/ca/en/certified-products-systems
Applicable federal and provincial legislation and municipal by-laws	E- Provincial Online at www.e-laws.gov.on.ca E- Federal online at www.laws.justice.gc.ca E- Municipal: https://www.huronkinloss.com/town-hall/by-laws/
Source Water Protection Plan	E- https://www.sourcewaterinfo.on.ca/maps/lucknow-drinking-water-system/ E- https://www.sourcewaterinfo.on.ca/maps/whitechurch-drinking-water-system/ E- https://home.waterprotection.ca/source-protection-plan/assessment-reports/saugeen-valley/
QEMS Records	
Rounds sheets	E-Round Sheets and Forms HC- HK Cluster Office
Facility Operations Logbook(s)	E – https://ocwa.eriscloud.com/
Operator training records	E - maintained in OCWA's Training Summary dB
Maintenance records	E - maintained in WMS
Internal Calibration records	E - maintained through WMS
External Calibration records	E - Calibration Records
Laboratory analyses	E- Lab Reports E - maintained through PDM
SCADA records	E - SCADA Reports
Internal QEMS audit reports	E - Internal Audits
External audit reports	E-External Audits
Ministry Inspection Reports	E-MECP Inspection Reports
Management Review documentation	E-Management Reviews

DOCUMENT AND RECORDS CONTROL LOCATIONS

Reviewed by: QEMS Representative	Approved by: Operations Management

Type of Document/Record	Designated Document Control Location (HC = Hardcopy, E = Electronic)
Summary Table of Action Items (Preventive/Corrective records)	E-Summary Table of Action Items
Annual and Summary Reports	E-Annual and Summary Reports
AWQI Reports	E-AWQI
Infrastructure review (capital/maintenance works recommendations)	E-Capital and Major Maintenance
Community Complaint Records	E – https://ocwa0.sharepoint.com/sites/MidwestCollab/Incidents/Forms/AllItems.aspx
Call Back Reports	E - Maximo
Form 1, Form 2, Form 3 and Director Notifications	E -Form 1, 2, 4, DN

Revision History

Date	Revision #	Reason for Revision
2025-03-31	0	Issue procedure
2025-05-25	1	Added ORO schedule, review location of Community Complaints
2025-06-25	2	Updated link to emergency contact/essential supplies list

1. Purpose

To document the following for the Township of Huron-Kinloss Drinking Water Systems – Lakeshore Drinking Water System:

- The name of the Owner and Operating Authority; and
- Provide a description of the system, including all applicable water sources, treatment system processes and distribution system components.

2. Definitions

Distribution System - 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.

Primary Disinfection - means a process or series of processes intended to remove or inactivate human pathogens such as viruses, bacteria and protozoa in water.

Secondary Disinfection - means a process or series of processes intended to provide and maintain a disinfectant residual in a drinking water system's distribution system, and in plumbing connected to the distribution system, for the purposes of:

(a) protecting water from microbiological re-contamination;
(b) reducing bacterial regrowth;
(c) controlling biofilm formation;
(d) serving as an indicator of distribution system integrity; and

includes the use of disinfectant residuals from primary disinfection to provide and maintain a disinfectant residual in a drinking water system's distribution system for the purposes described in clauses (a) to (d).

Treatment System - means any part of a drinking water system that is used in relation to the treatment of water and includes,

(a) anything that conveys or stores water and is part of a treatment process, including any treatment equipment installed in plumbing,
(b) anything related to the management of residue from the treatment process or the management of the discharge of a substance into the natural environment from the system, and
(c) a well or intake that serves as the source or entry point of raw water supply for the system;

3. Procedure

3.1 Drinking Water System Overview

The Lakeshore Drinking Water System (Lakeshore DWS) is owned by the Township of Huron-Kinloss and the Ontario Clean Water Agency is the Operating Authority.

The Lakeshore DWS supply consists of five drilled bedrock wells. It is characterized as a secure groundwater system. There are four well houses that deliver the potable water to

the Lakeshore communities, extending from Point Clark in the south, to Huronville in the north, and to the Courtney/Amberley Beach subdivision in the Township of Ashfield-Colborne-Wawanosh. The Township of Huron-Kinloss has an agreement with The Township of Ashfield-Colborne-Wawanosh, where the Courtney/Amberley Beach Subdivision is treated as part of the Lakeshore Drinking Water System. The well houses are located in Point Clark, Blairs Grove, Huronville South, and Murdoch Glen.

3.2 Source Water

General Characteristics

All the Lakeshore wells are secure, deep bedrock wells that penetrate limestone aquifers. Each well is equipped with a submersible pump, and treatment at all locations consists of disinfection using sodium hypochlorite (12%) and iron sequestering using sodium silicate. Due to the depth and structure of the aquifers, the water temperature is relatively constant (< 10°C), turbidity is low, and the water is relatively hard. The raw water is also relatively high in naturally-occurring sodium, fluoride and iron. Iron sequestering is achieved by means of treating the water with sodium silicate. Sequestering does not remove iron, but instead it prevents the dissolved iron from precipitating. When iron is precipitated, it can lead to stained plumbing fixtures and appear as discolouration in the water. Sodium silicate can leave a slight metallic taste in the water. Those who are supplied from the Lakeshore DWS are made aware of the various concentrations in their drinking water by communication from the Township of Huron-Kinloss on their municipal website.

The microbiology and turbidity data for the raw water indicate that there are no observed trends in deterioration of water quality and are characteristic of a true groundwater source.

Raw Water Characteristics

Site	Arsenic (ug/L)	Hardness (as $CaCO_3$) (mg/L)	Fluoride (mg/L)	Iron (ug/L)	Sodium (mg/L)
Half-MAC	5	-	-	-	-
MAC	10	-	1.5	-	20
AO/OG	-	80-100	-	300	200
Blairs Grove	0.4	765	1.71	581	100
Huronville South	0.4	237	2.19	150	54.3
Murdoch Glen	1.6	246	2.12	102	63.2
Point Clark	5.8	308	2.04	311	25.3

MAC: Maximum Allowable Concentration

AO/OG: Aesthetic Objective/Operational Guideline

Common Fluctuations

There are no common event driven fluctuations that affect this system.

Threats

There are no threats that affect this system.

Operational Challenges

The Huron-Kinloss DWS considers arsenic levels as an operational challenge. In Point Clark, arsenic levels are consistently over the half MAC (maximum acceptable concentration). On a quarterly basis, Operations Management ensures that samples are collected to assess trends in the source water.

3.3 Treatment System Description

Blairs Grove
Well 3 located at 28 Cathcart Street pumps to a single cell contact tank with baffle curtains for disinfection using sodium hypochlorite (12%). This tank provides the necessary contact time for primary and secondary disinfection.

Disinfection equipment for the production well consists of two chemical feed pumps (one duty, one stand-by), with automatic switchover and alarms, and a chemical storage tank, complete with secondary containment. Chlorine residuals are continuously monitored by on-line instrumentation to verify that each pumphouse is supplying safe drinking water to the system.

The pumphouse includes a chemical feed pump the well, and a chemical storage tank, complete with secondary containment used for iron sequestering. Chlorinated water is immediately treated with sodium silicate for iron sequestering. Sequestering does not remove iron, but instead it prevents the dissolved iron from precipitating, which can stain plumbing fixtures and appear as discoloration in the water.

The water is pumped from the contact tank to the pressure zone 1 distribution system through the highlift pump.

Point Clark
Well 2 and 3 located at 603 Tuscarora Road pumps to a single cell contact tank with baffle curtains for disinfection using sodium hypochlorite (12%). This tank provides the necessary contact time for primary and secondary disinfection.

Disinfection equipment for each production well consists of two chemical feed pumps (one duty, one stand-by), with automatic switchover and alarms, and a chemical storage tank, complete with secondary containment. Chlorine residuals are continuously monitored by on-line instrumentation to verify that each pumphouse is supplying safe drinking water to the system.

The pumphouse includes a chemical feed pump the well, and a chemical storage tank, complete with secondary containment used for iron sequestering. Chlorinated water is immediately treated with sodium silicate for iron sequestering. Sequestering does not remove iron, but instead it prevents the dissolved iron from precipitating, which can stain plumbing fixtures and appear as discoloration in the water.

The water is pumped from the contact tank to the pressure zone 1 distribution system through the highlift pumps.

Murdoch Glen

Well 2 located at 815 Parkplace pumps to a contact pipe for disinfection using sodium hypochlorite (12%). This pipe provides the necessary contact time for primary and secondary disinfection.

Disinfection equipment for the production well consists of two chemical feed pumps (one duty, one stand-by), with automatic switchover and alarms, and a chemical storage tank, complete with secondary containment. Chlorine residuals are continuously monitored by on-line instrumentation to verify that each pumphouse is supplying safe drinking water to the system.

The pumphouse includes a chemical feed pump the well, and a chemical storage tank, complete with secondary containment used for iron sequestering. Chlorinated water is immediately treated with sodium silicate for iron sequestering. Sequestering does not remove iron, but instead it prevents the dissolved iron from precipitating, which can stain plumbing fixtures and appear as discoloration in the water.

The water is pumped from the contact pipe to the reservoir for additional storage. There are four highlift pumps that pump to pressure zone 2 (HLP 2 and 3) and to pressure zone 3 (HLP 4 and 5) in the distribution zone.

Huronville South

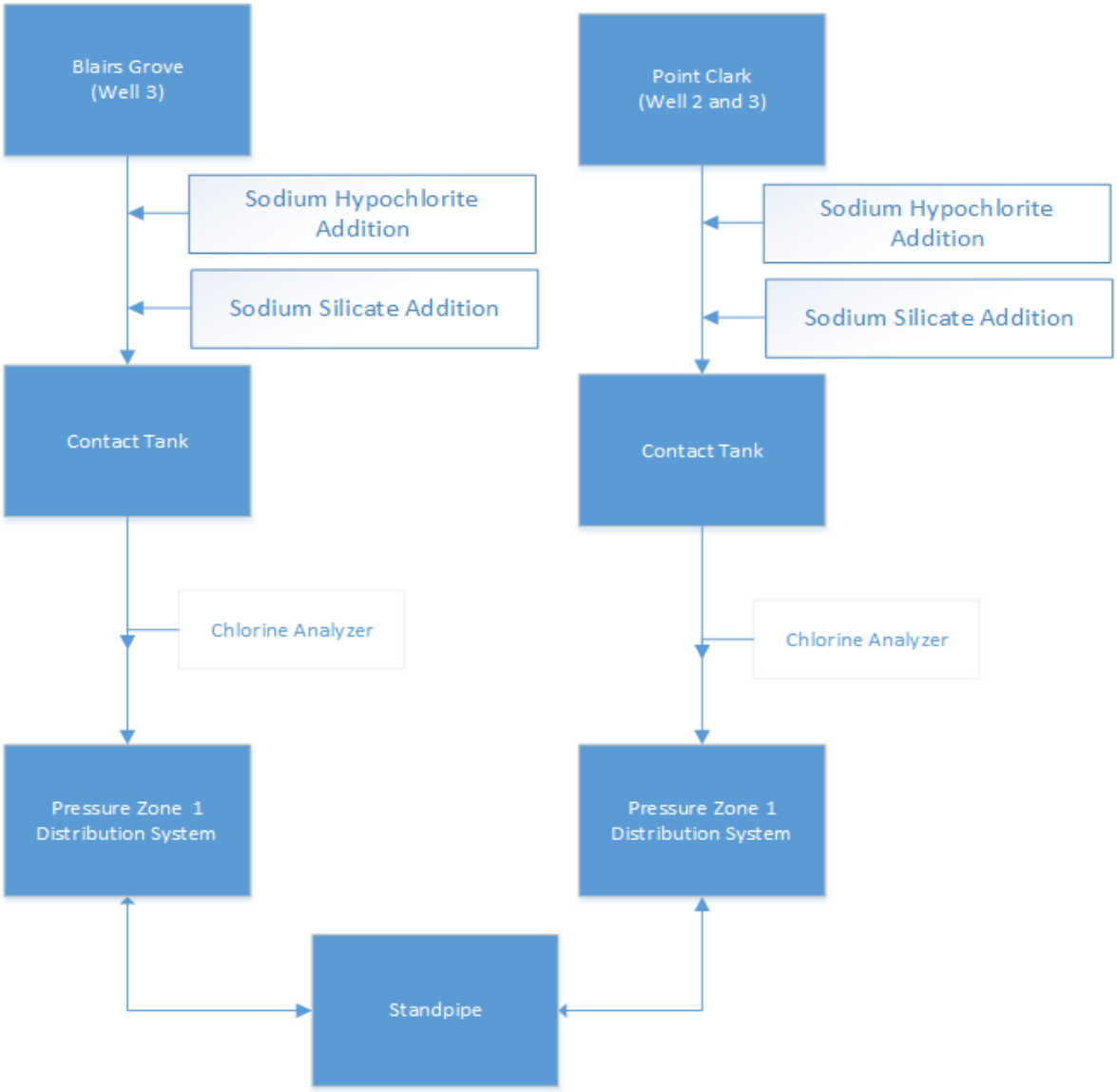
Well 2 located at Pentangore Row South pumps to a single cell contact tank with baffle curtains for disinfection using sodium hypochlorite (12%). This tank provides the necessary contact time for primary and secondary disinfection.

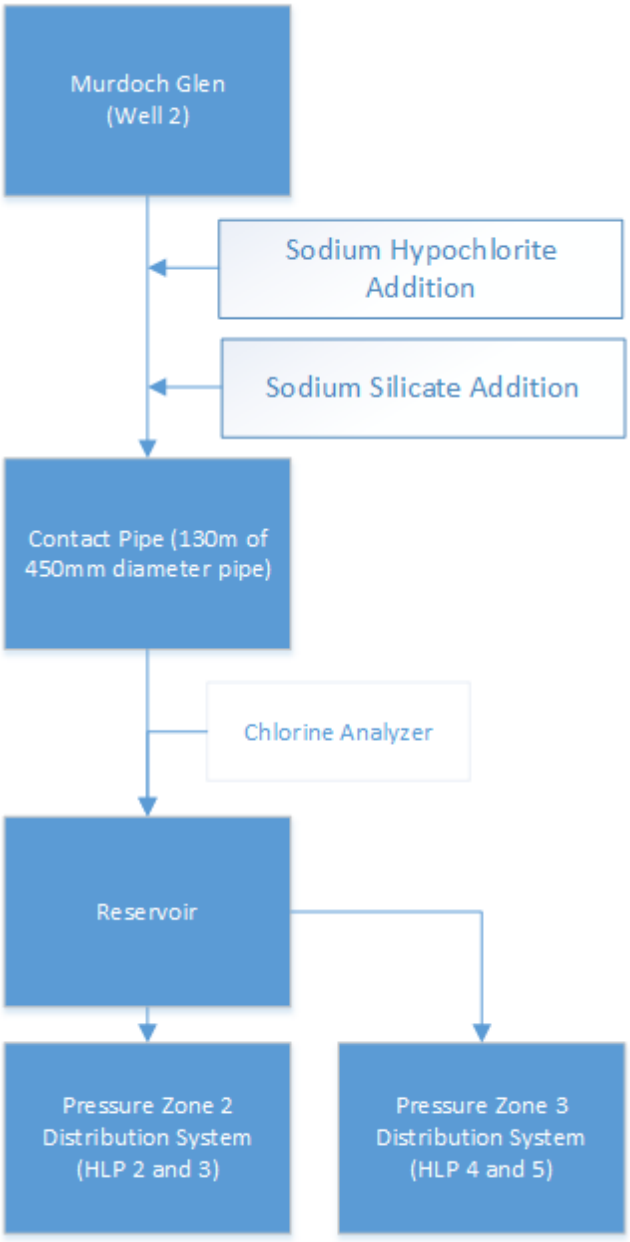
Disinfection equipment for the production well consists of two chemical feed pumps (one duty, one stand-by), with automatic switchover and alarms, and a chemical storage tank, complete with secondary containment. Chlorine residuals are continuously monitored by on-line instrumentation to verify that each pumphouse is supplying safe drinking water to the system.

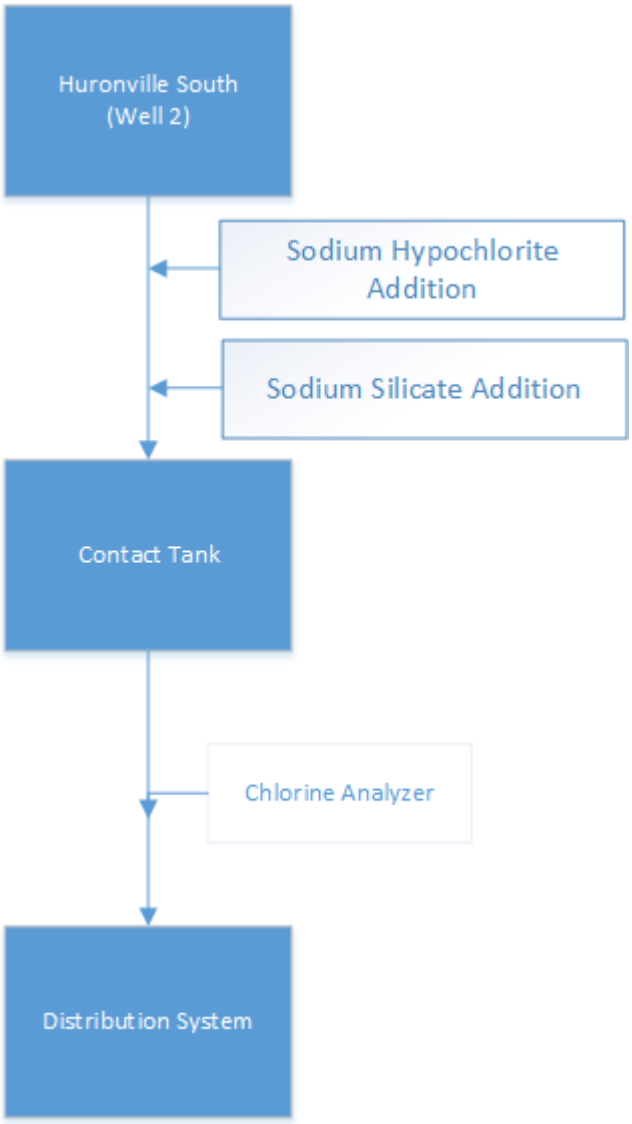
The pumphouse includes a chemical feed pump the well, and a chemical storage tank, complete with secondary containment used for iron sequestering. Chlorinated water is immediately treated with sodium silicate for iron sequestering. Sequestering does not remove iron, but instead it prevents the dissolved iron from precipitating, which can stain plumbing fixtures and appear as discoloration in the water.

The water is pumped from the contact tank to the distribution system through the highlift pump.

3.4 Treatment System Process Flow Chart




Murdoch Glen (Well 2)
Sodium Hypochlorite Addition
Sodium Silicate Addition
Contact Pipe (130m of 450mm diameter pipe)
Chlorine Analyzer
Reservoir
Pressure Zone 2 Distribution System (HLP 2 and 3)
Pressure Zone 3 Distribution System (HLP 4 and 5)



3.5 Description of the Distribution System Components

The Lakeshore DWS currently services 2,441 water connections in the Huron-Kinloss Lakeshore community, extending from Point Clark in the south, to Huronville in the north, and 140 water connections in the subsystem supplying the Courtney/Amberley Beach Subdivision in the Township of Ashfield-Colborne-Wawanosh. In total, the Lakeshore DWS supplies an estimated seasonal population of approximately 3183. The Lakeshore area has a large seasonal population and therefore, the demands are significantly higher during the cottage season.

The Lakeshore Drinking Water System comprises of three different pressure zones. Interconnections permit water to be transmitted from one pressure zone to another,

including during emergency or firefighting conditions. Pressure Zone 1 (the southern system) comprises the Point Clark pumphouse, the Blairs Grove pumphouse, and the Standpipe. The northern portion of the Lakeshore DWS is divided into two pressure zones (Pressure Zone 2 and Pressure Zone 3). Pressure Zone 2 is serviced by the Huronville South pumphouse, and Zone 3 is serviced by the Murdoch Glen pumphouse. Murdoch Glen has the capability of supplying Zone 2 and Zone 3, plus stand-by with the diesel generator if required.

The Bell Drive storage facility is a former pumphouse converted into a storage facility and is located at 179 Bell Drive. It currently houses water treatment chemicals and equipment. Piping still exists in this building to allow flushing of the distribution system and for water sample collection.

A Standpipe is situated in the Point Clark are a at 3405 Concession 2, and is constructed of bolted steel. The 31 m high and 9.4 m wide Standpipe has an effective storage of approximately 1,500 m^3. The high lift pumps for the Point Clark pumphouse and the Blairs Grove pumphouse are automatically controlled by the water level in the Standpipe. The Standpipe is surrounded by a chain-link fence and has padlocks to prevent unwarranted entry.

A 130 kW diesel generator, located at the Murdoch Glen pumphouse, includes a 1,100 L capacity fuel storage tank and is used for emergency power supply.

The 94.4 km distribution piping consists of PVC and polyethylene piping, ranging from 50mm to 250mm in diameter. There are 181 hydrants, 46 blow-offs, and one (1) automatic flushing device is located on Camerons Lane. For sampling purposes, there are six (6) sample stations, two (2) of which are located in ACW on Amberley Beach Road.

The system pressure for Blairs Grove is approximately 67 psi, Huronville South is approximately 76 psi, Murdoch Glen is approximately 70 psi in Zone 2 and 76 psi in Zone 3, and Point Clark is approximately 61 psi.

All sites are controlled, monitored, and alarmed through a Supervisory Control and Data Acquisition (SCADA) system which is connected to the main controller, autodialer, and server at the Ripley Municipal Office. The desktop computer used by the system's operators is located at the Ripley Township Shed and is connected remotely to the SCADA server.

As a redundancy, each site is also equipped with an auto-dialer that is independent of the SCADA system, and is used to call out alarms in the event of communications/SCADA failure. This SCADA system provides the operator with the ability to monitor current operating status of the supply and treatment equipment throughout the water system at any given time via remote access by computer or Smartphone, and to have control over operations.

4. Related Documents

Distribution Drawings – Reference OP-05A Distribution System Drawings
Drinking Water Works Permit (DWWP)
Municipal Drinking Water License (MDWL)

5. Revision History

Date	Revision #	Reason for Revision
2024-11-18	0	Procedure issued
2025-05-20	1	Updated Operational Challenges to identify the high levels of arsenic found in Point Clark treated water Updated Raw characteristic chart for Point Clarks recent arsenic results Included where to reference Distribution Drawings, MDWL, DWWP

1. Purpose

To document the following for the Township of Huron-Kinloss Drinking Water Systems – Ripley Drinking Water System:

- The name of the Owner and Operating Authority; and
- Provide a description of the system, including all applicable water sources, treatment system processes and distribution system components.

2. Definitions

Distribution System - 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.

Primary Disinfection - means a process or series of processes intended to remove or inactivate human pathogens such as viruses, bacteria and protozoa in water.

Secondary Disinfection - means a process or series of processes intended to provide and maintain a disinfectant residual in a drinking water system's distribution system, and in plumbing connected to the distribution system, for the purposes of:

(a) protecting water from microbiological re-contamination;
(b) reducing bacterial regrowth;
(c) controlling biofilm formation;
(d) serving as an indicator of distribution system integrity; and

includes the use of disinfectant residuals from primary disinfection to provide and maintain a disinfectant residual in a drinking water system's distribution system for the purposes described in clauses (a) to (d).

Treatment System - means any part of a drinking water system that is used in relation to the treatment of water and includes,

(a) any thing that conveys or stores water and is part of a treatment process, including any treatment equipment installed in plumbing,
(b) any thing related to the management of residue from the treatment process or the management of the discharge of a substance into the natural environment from the system, and
(c) a well or intake that serves as the source or entry point of raw water supply for the system;

3. Procedure

3.1 Drinking Water System Overview

The Ripley Drinking Water System (Ripley DWS) is owned by the Township of Huron-Kinloss and the Ontario Clean Water Agency is the Operating Authority.

The Ripley DWS is characterized as a secure groundwater system, consisting of 3 wells, 1 pumphouse and 1 tower that deliver potable water to the Village of Ripley.

3.2 Source Water

General Characteristics

All the Ripley wells are secure, deep bedrock wells that penetrate limestone aquifers. Due to the depth and structure of the aquifers, the water temperature is relatively constant (< 10°C), turbidity is low, and the water is relatively hard. The raw water is also relatively high in naturally-occurring sodium and fluoride. Those who are supplied from the Ripley DWS are made aware of the various concentrations in their drinking water by communication from the Township of Huron-Kinloss municipal website.

Well No. 2 is located at 74 Huron St. The well is equipped with a submersible well pump which pumps to the pumphouse. Disinfection is accomplished using 12% sodium hypochlorite. The Arsenic level is very close to the Half-MAC and is being monitored quarterly.

Well No. 3 and No. 4 are located at 93C Huron St and are approximately 16 m apart. Each well is equipped with a submersible well pump. The water from both of these wells is treated at the Elevated Tank site. Disinfection is accomplished using 12% sodium hypochlorite. Well No. 3 and No. 4 are considered to be hydraulically connected.

All three (3) production wells have been characterized as true groundwater supplies. The microbiological and turbidity data indicates that there is no deterioration in water quality trends.

Raw Water Characteristics

Site	Arsenic (ug/L)	Hardness (as $CaCO_3$) (mg/L)	Fluoride (mg/L)	Iron (ug/L)	Sodium (mg/L)
Half-MAC	5	-	-	-	-
MAC	10	-	1.5	-	20
AO/OG	-	80-100	-	300	200
Well No. 2	3.6	212	2.1	197	28.6
Well No. 3	0.9	190	2.1	ND	30
Well No. 4	0.8	220	1.9	ND	30

MAC: Maximum Allowable Concentration
AO/OG: Aesthetic Objective/Operational Guideline
ND: Not Detected

Common Fluctuations

There are no common event driven fluctuations that affect this system.

Threats

There are no threats that affect this system.

Operational Challenges

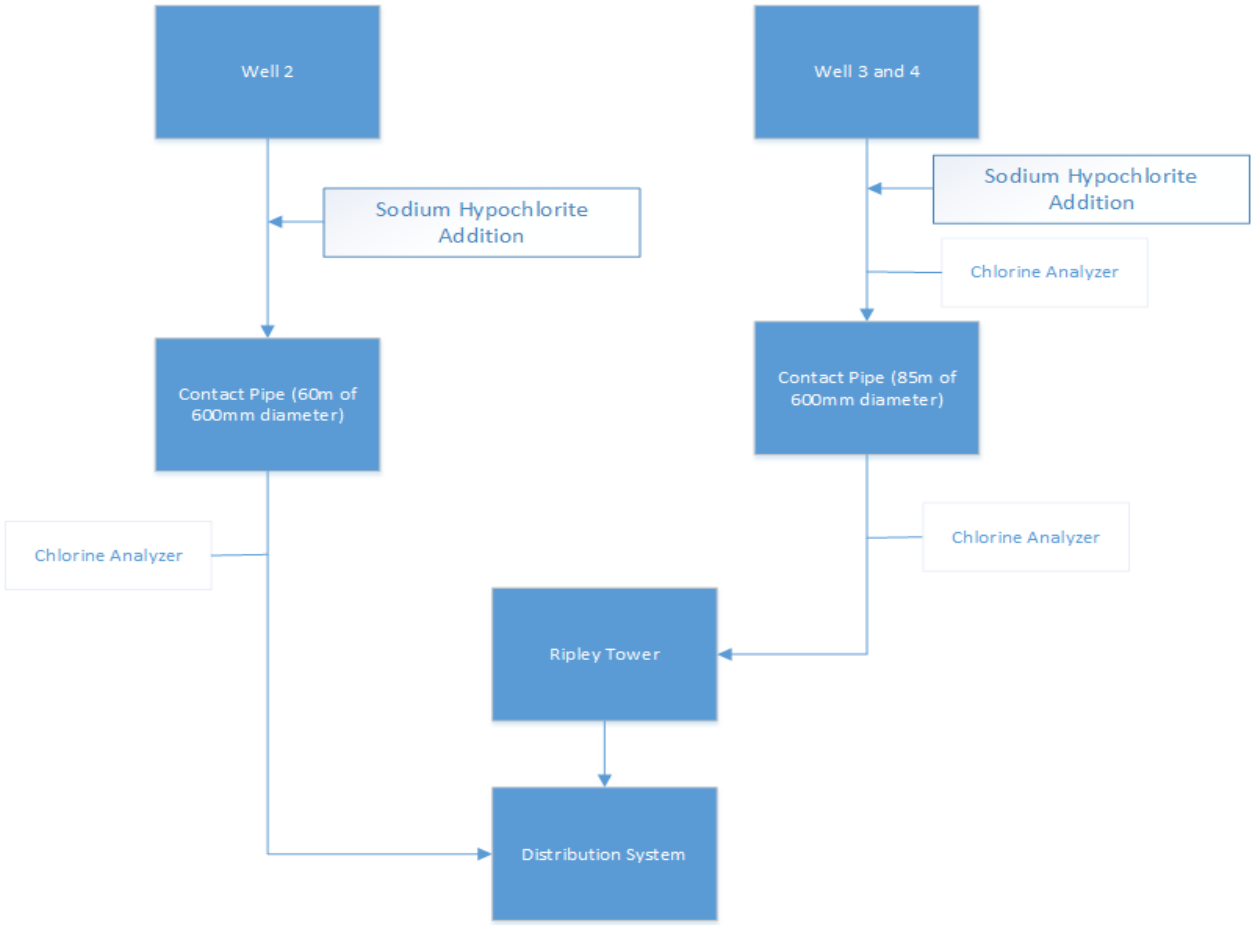
The Huron-Kinloss DWS considers fluoride and sodium levels as an operational challenge. Fluoride and sodium levels in the treated water are a result of naturally occurring fluoride in the aquifers. These challenges are communicated to the public through notifications provided by the health unit.

3.3 Treatment System Description

Both the pumphouse and the Elevated Tank (Tower) site ensures that raw water is disinfected using sodium hypochlorite (12%). The pumphouse and the Tower site have chlorine contact watermains to provide the necessary contact time between sodium hypochlorite and the raw water to meet primary and secondary disinfection requirements.

Disinfection equipment for each production well consists of two chemical feed pumps (one duty, one stand-by), with automatic switchover and alarms, and a chemical storage tank, complete with secondary containment. Chlorine residuals are continuously monitored by on-line instrumentation to verify that each is supplying safe drinking water to the system.

3.4 Treatment System Process Flow Chart



3.5 Description of the Distribution System Components

The Ripley DWS has 366 water connections, and provides potable water to an estimated population of 800 residents.

The 4.5 km system consists mostly of the original cast iron pipes, some ductile iron pipe, and the newer pipes are PVC. Distribution piping is mainly 150 mm diameter with a small section of 100 mm.

The system pressure is maintained by the Ripley Elevated Tank. The 42 m (138 ft) high Elevated Tank has a total usable storage volume of 1,465 m ^{3}. The system pressure varies between 350 - 390 kPa (50 - 56 psi).

There are 35 fire hydrants, 1 blow-off, and 48 valves associated with the Ripley distribution system.

A 250 kW stand-by diesel generator and a 2,273 L fuel storage tank are located in the Fire Hall adjacent to the pumphouse, which provides emergency power to the

pumphouse and Ripley Fire Hall. A Source Water Protection Plan is in place for the below-grade fuel tank.

A second 200 kW stand-by diesel generator and a 1,423 L fuel storage tank are located behind Ripley Community Centre/Arena adjacent to the Elevated Tank site, which provides emergency power to the Elevated Tank site and the Community Centre/Arena.

The sites are controlled, monitored, and alarmed through a Supervisory Control and Data Acquisition (SCADA) system which is connected to the main controller, autodialer, and server at the Ripley Municipal Office. The desktop computer used by the system's operators is located at the Ripley Township Shed and is connected remotely to the SCADA server.

As a redundancy, each site is also equipped with an auto-dialer that is independent of the SCADA system, and is used to call out alarms in the event of communications/SCADA failure. This SCADA system provides the operator with the ability to monitor current operating status of the supply and treatment equipment throughout the water system at any given time via remote access by computer or Smartphone, and to have control over operations.

4. Related Documents

Distribution Drawings – Reference OP-05A Distribution System Drawings
Drinking Water Works Permit (DWWP)
Municipal Drinking Water License (MDWL)

5. Revision History

Date	Revision #	Reason for Revision
2024-11-18	0	Procedure issued
2025-05-09	1	Updated section 3.2 to identify three wells instead of four. Four wells was incorrect.
2025-05-20	2	Updated Operational Challenges to identify the high levels of Fluoride and Sodium in the treated water. Included where to reference Distribution Drawings, MDWL, DWWP

1. Purpose

To document the following for the Township of Huron-Kinloss Drinking Water Systems – Lucknow Water Drinking Water System:

- The name of the Owner and Operating Authority; and
- Provide a description of the system, including all applicable water sources, treatment system processes and distribution system components.

2. Definitions

Distribution System - 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.

Primary Disinfection - means a process or series of processes intended to remove or inactivate human pathogens such as viruses, bacteria and protozoa in water.

Secondary Disinfection - means a process or series of processes intended to provide and maintain a disinfectant residual in a drinking water system's distribution system, and in plumbing connected to the distribution system, for the purposes of:

(a) protecting water from microbiological re-contamination;
(b) reducing bacterial regrowth;
(c) controlling biofilm formation;
(d) serving as an indicator of distribution system integrity; and

includes the use of disinfectant residuals from primary disinfection to provide and maintain a disinfectant residual in a drinking water system's distribution system for the purposes described in clauses (a) to (d).

Treatment System - means any part of a drinking water system that is used in relation to the treatment of water and includes,

(a) any thing that conveys or stores water and is part of a treatment process, including any treatment equipment installed in plumbing,
(b) any thing related to the management of residue from the treatment process or the management of the discharge of a substance into the natural environment from the system, and
(c) a well or intake that serves as the source or entry point of raw water supply for the system;

3. Procedure

3.1 Drinking Water System Overview

The Lucknow Drinking Water System (Lucknow DWS) is owned by the Township of Huron-Kinloss and the Ontario Clean Water Agency is the Operating Authority.

The Lucknow DWS is characterized as a secure groundwater system consisting of two well suppling to the Village of Lucknow and ten (10) Lucknow South properties in the Township of Ashfield-Colborne-Wawanosh in Huron County. The Township of Huron-Kinloss has an agreement with The Township of Ashfield-Colborne-Wawanosh, where the Lucknow South distribution system is treated as part of the Lucknow Drinking Water System (By-Law 60-2014). Each well supply is located within its own pumphouse in the Village of Lucknow.

The Lucknow drinking water system supplies water to residential, commercial, and industrial development. This water system also includes a 1,600m^3 elevated tank located at 650 Wheeler Street.

3.2 Source Water

General Characteristics

Well 4 is equipped with a submersible well pump and is located at 600 Havelock St. Well 5 is also equipped with a submersible well pump and is located at 381 South Delhi St.

Both wells have naturally occurring higher levels of fluoride that exceeds the Ontario Drinking Water Quality Standards. The arsenic level is very close to the Half-MAC and is being monitored quarterly.

Both production wells have been characterized as true groundwater supplies, with microbiological and turbidity data indicating that there is no deterioration of water quality trends.

Raw Water Characteristics

Site	Arsenic (ug/L)	Hardness (as $CaCO_3$) (mg/L)	Fluoride (mg/L)	Iron (ug/L)	Sodium (mg/L)
Half-MAC	5	-	-	-	-
MAC	10	-	1.5	-	20
AO/OG	-	80-100	-	300	200
Well No. 4	3.5	206	1.75	132	11.1
Well No. 5	4.7	209	1.78	264	12.8

MAC: Maximum Allowable Concentration
AO/OG: Aesthetic Objective/Operational Guideline

Common Fluctuations

There are no common event driven fluctuations that affect this system.

Threats

There are no threats that affect this system.

Operational Challenges

The Huron-Kinloss DWS considers fluoride and sodium levels as an operational challenge. Fluoride and sodium levels in the treated water are a result of naturally occurring fluoride in the aquifers. These challenges are communicated to the public through notifications provided by the health unit.

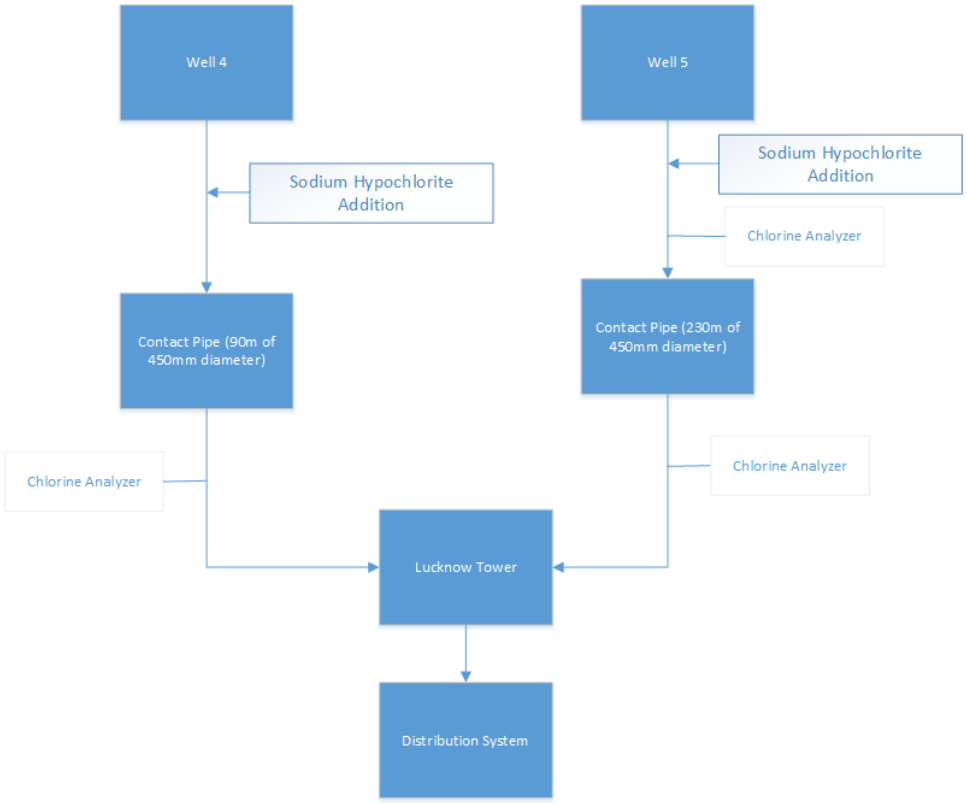
3.3 Treatment System Description

Each pumphouse in the Lucknow DWS ensures that raw water is disinfected using sodium hypochlorite (12%) to meet primary and secondary disinfection requirements.

Sodium hypochlorite is injected into the raw water prior to the chlorine contact pipes.

Disinfection equipment for each production well consists of two chemical feed pumps (one duty, one stand-by), with automatic lockouts and alarms, and a chemical storage tank, complete with secondary containment. Chlorine residuals are continuously monitored by on-line instrumentation to verify that each pumphouse is supplying safe drinking water to the system.

3.4 Treatment System Process Flow Chart



3.5 Description of the Distribution System Components

The Lucknow DWS has approximately 670 water service connections. The Lucknow DWS also supplies drinking water to approximately 10 properties in the Municipality of Ashfield-Colborne -Wawanosh (Lucknow Line) in Huron County. This section of the distribution system is known as South Lucknow. In total, the Lucknow DWS serves an estimated population of approximately 1154.

Distribution mains consist of cast iron, ductile iron, or PVC, depending on the location and date of installation. They are predominantly 150 mm, but range between 50 mm to 250 mm throughout the village.

The 19.8 km network has 65 fire hydrants and 4 blow-offs. A former pumphouse, located at 482 Ross St, contains a diesel booster pump, designed to increase water pressure in the event of a fire.

The Lucknow DWS has elevated storage located at 650 Wheeler St. The total operating volume of the standpipe is 1600 m^3. The well pumps at Well No. 4 and Well No. 5 are automatically controlled by the water level in the tower.

The system pressure ranges from 190 - 380 kPa (27 - 55 psi).

Both sites are controlled, monitored, and alarmed through a Supervisory Control and Data Acquisition (SCADA) system which is connected to the main controller, autodialer, and server at the Ripley Municipal Office. The desktop computer used by the system's operators is located at the Ripley Township Shed and is connected remotely to the SCADA server.

As a redundancy, each site is also equipped with an auto-dialer that is independent of the SCADA system, and is used to call out alarms in the event of communications/SCADA failure.

4. Related Documents

Distribution Drawing – Reference OP-05A Distribution System Drawings
Drinking Water Works Permit (DWWP)
Municipal Drinking Water License (MDWL)

5. Revision History

Date	Revision #	Reason for Revision
2024-11-18	0	Procedure issued
2025-05-20	1	Updated Operational Challenges to identify the high levels of fluoride found in both Lucknow wells treated water Included where to reference Distribution Drawings, DWWP, MDWL

1. Purpose

To document the following for the Whitechurch Drinking Water System:

- The name of the Owner and Operating Authority; and
- Provide a description of the system, including all applicable water sources, treatment system processes and distribution system components.

2. Definitions

Distribution System - 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.

Primary Disinfection - means a process or series of processes intended to remove or inactivate human pathogens such as viruses, bacteria and protozoa in water.

Secondary Disinfection - means a process or series of processes intended to provide and maintain a disinfectant residual in a drinking water system's distribution system, and in plumbing connected to the distribution system, for the purposes of:

(a) protecting water from microbiological re-contamination;
(b) reducing bacterial regrowth;
(c) controlling biofilm formation;
(d) serving as an indicator of distribution system integrity; and

includes the use of disinfectant residuals from primary disinfection to provide and maintain a disinfectant residual in a drinking water system's distribution system for the purposes described in clauses (a) to (d).

Treatment System - means any part of a drinking water system that is used in relation to the treatment of water and includes,

(a) any thing that conveys or stores water and is part of a treatment process, including any treatment equipment installed in plumbing,
(b) any thing related to the management of residue from the treatment process or the management of the discharge of a substance into the natural environment from the system, and
(c) a well or intake that serves as the source or entry point of raw water supply for the system;

3. Procedure

3.1 Drinking Water System Overview

The Whitechurch Drinking Water System (Whitechurch DWS) is owned by the Township of Huron-Kinloss and the Ontario Clean Water Agency is the Operating Authority.

The Whitechurch DWS is characterized as a secure groundwater system, consisting of two drilled bedrock wells, on the same site as the pumphouse that delivers potable water to the Hamlet of Whitechurch.

3.2 Source Water

General Characteristics

The Whitechurch DWS consists of two (2) drilled bedrock wells: Well No. 1 (South) drilled in 1961 and Well No. 2 (North) drilled in 2007.

Each well is equipped with a submersible well pump. Both wells are located at 9 Whitechurch Street and are approximately 18 m apart. The water from both these wells is treated at the same pumphouse.

Both production wells have been characterized as true groundwater supplies. The microbiological and turbidity data indicates that there is no deterioration water quality trends.

Water samples collected from both wells show Barium concentrations that exceed the half-MAC of 500 µg/L. The Municipal Drinking Water Licence (MDWL) for the system requires the Owner to ensure treated water samples are collected on a quarterly basis and that the Barium results are reported to the Local Health Unit annually. Those who are supplied water from the Whitechurch DWS are made aware of the various concentrations in their drinking water by communication through the Township of Huron-Kinloss municipal website.

Raw Water Characteristics

Site	Barium (ug/L)	Hardness (as $CaCO_3$) (mg/L)	Fluoride (mg/L)	Iron (ug/L)	Sodium (mg/L)
Half-MAC	500	-	-	-	-
MAC	1000	-	1.5	-	20
AO/OG	-	80-100	-	300	200
Well 1 & 2 (TW)	773	292	1.09	744	17.9

MAC: Maximum Allowable Concentration AO/OG: Aesthetic Objective/Operational Guideline

Common Fluctuations

There are no common event driven fluctuations that affect this system.

Threats

There are no threats that affect this system.

Operational Challenges

The Huron-Kinloss DWS considers barium levels as an operational challenge. In Whitechurch barium levels are consistently over the half MAC (maximum acceptable concentration). On a quarterly basis, Operations Management ensures that samples are collected to assess trends in the source water.

3.3 Treatment System Description

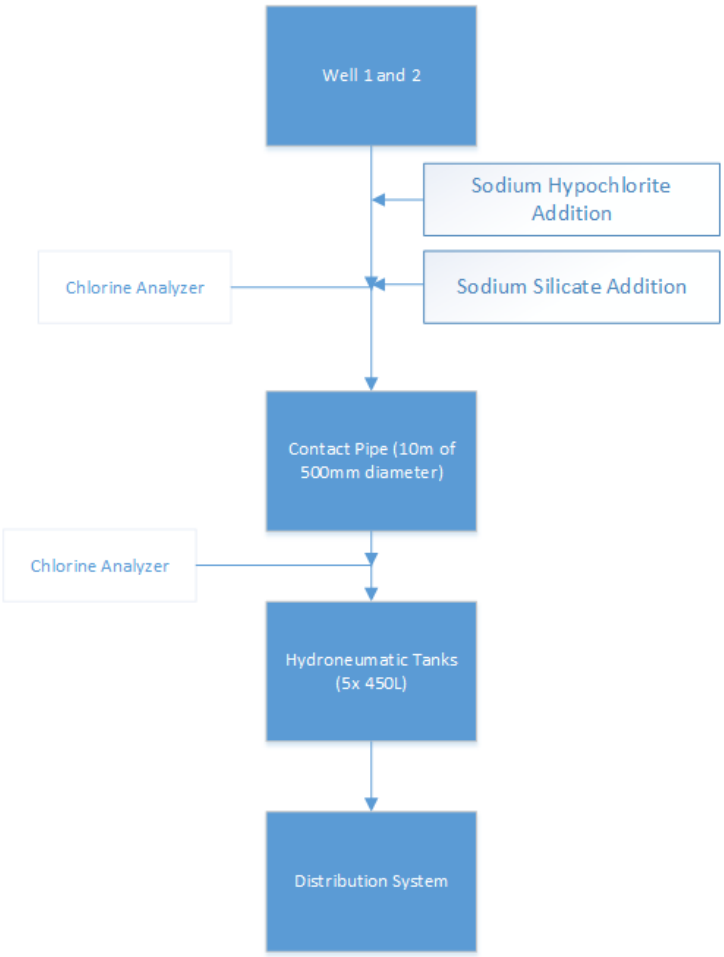
The Whitechurch DWS ensures that raw water is primary and secondary disinfected by use of sodium hypochlorite (12%). There is a 500mm chlorine contact pipe that is 10m long that provides the necessary contact time for the chlorine to achieve primary disinfection.

The disinfection system includes two (2) chemical feed pumps (one dedicated for each well) and a chemical storage tank, complete with secondary containment. Sodium hypochlorite is injected on each wells discharge pipe prior to the contact pipe. There are 2 450L retention tanks for mixing as well. The free chlorine residuals are monitored prior to the contact pipe and again after treatment. Chlorine residuals are continuously monitored by SCADA system to verify the pumphouse is supplying safe drinking water to the system.

The Whitechurch DWS has iron levels higher than what is considered to be aesthetically acceptable. The system includes two (2) chemical feed pumps (one dedicated for each well), with a chemical storage tank, complete with secondary containment. Chlorinated water is immediately treated with sodium silicate for iron sequestering prior to the chlorine contact watermain. Sequestering does not remove iron, but instead it prevents the dissolved iron from precipitating, which can stain plumbing fixtures and appear as discoloration in the water. Sodium silicate can leave a slight metallic taste in the water.

Backup power is supplied by a 15kW diesel generator.

3.4 Treatment System Process Flow Chart



3.5 Description of the Distribution System Components

The Whitechurch DWS has 42 water service connections, and provides potable water to an estimated population of approximately 109. While the system provides water to the residents and businesses of Whitechurch, it also delivers drinking water to a small number of properties that are outside the Township of Huron-Kinloss boundary.

The distribution system was upgraded in 2017 to 100 mm diameter (4-inch) PVD DR-18. There are no fire hydrants or elevated storage.

There are four (4) isolation valves, two (2) designated sample stations, and two (2) blow-offs. The sample stations and blow-offs are located near the dead ends of the distribution system.

The system pressure is maintained using pressure tanks at the pumphouse and ranges between 310 - 450 kPa (45 - 65 psi).

4. Related Documents

Distribution Drawing - Reference OP-05A Distribution System Drawings
Municipal Drinking Water Licence (MDWL)
Drinking Water Works Permit (DWWP)

5. Revision History

Date	Revision #	Reason for Revision
2024-11-18	0	Procedure issued
2025-05-20	1	Updated Operational Challenges to identify the high levels of barium found in Whitechurch treated water Updated Raw characteristic chart for Whitechurchs recent barium results Included where to reference Distribution Drawings, DWWP, MDWL

1. Purpose

To document the process for conducting a risk assessment to identify and assess potential hazardous events and associated hazards that could affect drinking water safety.

2. Definitions

Consequence – the potential impact to public health and/or operation of the drinking water system if a hazard/hazardous event is not controlled

Control Measure – includes any processes, physical steps or other practices that have been put in place at a drinking water system to prevent or reduce a hazard before it occurs

Critical Control Point (CCP) – An essential step or point in the subject system at which control can be applied by the Operating Authority to prevent or eliminate a drinking water health hazard or reduce it to an acceptable level

Drinking Water Health Hazard – means, in respect of a drinking water system,

a) a condition of the system or a condition associated with the system's waters, including any thing found in the waters,
    i. that adversely affects, or is likely to adversely affect, the health of the users of the system,
    ii. that deters or hinders, or is likely to deter or hinder, the prevention or suppression of disease, or
    iii. that endangers or is likely to endanger public health,
b) a prescribed condition of the drinking water system, or
c) a prescribed condition associated with the system's waters or the presence of a prescribed thing in the waters

Hazardous Event – an incident or situation that can lead to the presence of a hazard

Hazard – a biological, chemical, physical or radiological agent that has the potential to cause harm

Likelihood – the probability of a hazard or hazardous event occurring

3. Procedure

3.1 Operations Management ensures that operations personnel are assigned to conduct a risk assessment at least once every thirty-six months. At a minimum, the Risk Assessment Team must include the QEMS Representative, at least one Operator for the system and at least one member of Operations Management.

3.2 The QEMS Representative is responsible for coordinating the risk assessment and ensuring that documents and records related to the risk assessment activities are maintained.

3.3 The Risk Assessment Team performs the risk assessment as follows:

3.3.1 OP-07 Risk Assessment and OP-08 Risk Assessment Outcomes are reviewed.

3.3.2 For each of the system's activities/process steps, potential hazardous events and associated hazards (possible outcomes) that could impact the system's ability to deliver safe drinking water are identified. At a minimum, potential hazardous events and associated hazard as identified in the most current version of the Ministry document titled "Potential Hazardous Events for Municipal Residential Drinking Water Systems" (as applicable to the system type) must be considered.

3.3.3 For each of the hazardous events, control measures currently in place at the system to eliminate the hazard or prevent it from becoming a threat to public health are specified. Control measures may include alarms, monitoring procedures, SOPs/contingency plans, preventive maintenance activities, backup equipment, engineering controls, etc.

3.3.4 To ensure that potential drinking water health hazards are addressed and minimum treatment requirements as regulated by SDWA O. Reg. 170/03 and the Ministry's "Procedure for Disinfection of Drinking Water in Ontario" (as amended) are met, OCWA has established mandatory Critical Control Points (CCPs).

<u>As a minimum, the following must be included as CCPs (as applicable):</u>

- Equipment or processes required to achieve primary disinfection (e.g., chemical and/or UV disinfection system, coagulant dosing system, filters, etc.)
- Equipment or processes necessary for maintaining secondary disinfection in the distribution system
- Fluoridation system

3.3.5 Additional CCPs for the system are determined by evaluating and ranking the hazardous events for the remaining activities/process steps (i.e., those <u>not</u> included as OCWA's minimum CCPs).

3.3.6 Taking into consideration existing control measures (including the reliability and redundancy of equipment), each hazardous event is assigned a value for the likelihood and a value for the consequence of that event occurring based on the following criteria:

Value	Likelihood of Hazardous Event Occurring
1	**Rare** – Estimated to occur every 50 years or more (usually no documented occurrence at site)
2	**Unlikely** – Estimated to occur in the range of 10 – 49 years
3	**Possible** – Estimated to occur in the range of 1 – 9 years
4	**Likely** – Occurs monthly to annually
5	**Certain** – Occurs monthly or more frequently

Value	Consequence of Hazardous Event Occurring
1	**Insignificant** – Little or no disruption to normal operations, no impact on public health
2	**Minor** – Significant modification to normal operations but manageable, no impact on public health
3	**Moderate** – Potentially reportable, corrective action required, potential public health impact, disruption to operations is manageable
4	**Major** – Reportable, system significantly compromised and abnormal operations if at all, high level of monitoring and corrective action required, threat to public health
5	**Catastrophic** – Complete failure of system, water unsuitable for consumption

The likelihood and consequence values are multiplied to determine the risk value (ranking) of each hazardous event. Hazardous events with a ranking of 12 or greater are considered high risk.

3.3.7 Hazardous events and rankings are reviewed and any activity/process step is identified as an additional CCP if <u>all</u> of the following criteria are met:

- ✓ The associated hazardous event has a ranking of 12 or greater;
- ✓ The associated hazardous event can be controlled through control measure(s);
- ✓ Operation of the control measures can be monitored and corrective actions can be applied in a timely fashion;
- ✓ Specific control limits can be established for the control measure(s); and
- ✓ Failure of the control measures would lead to immediate notification of Medical Officer of Health (MOH) or Ministry or both.

3.4 The outcomes of the risk assessment are documented as per OP-08 Risk Assessment Outcomes.

3.5 At least once every calendar year, the QEMS Representative facilitates the verification of the currency of the information and the validity of the assumptions used in the risk assessment in preparation for the Management Review (OP-20). When performing this review, the following may be considered:

- Process/equipment changes
- Reliability and redundancy of equipment
- Emergency situations/service interruptions
- CCP deviations
- Audit/inspection results
- Changes to the Ministry document “Potential Hazardous Events for Municipal Residential Drinking Water Systems” (as amended)

4. Related Documents

OP-08 Risk Assessment Outcomes
OP-20 Management Review
Ministry’s “Potential Hazardous Events for Municipal Residential Drinking Water Systems” (as amended)
Ministry’s “Procedure for Disinfection of Drinking Water in Ontario” (as amended)

5. Revision History

Date	Revision #	Reason for Revision
2024-11-18	0	Procedure issued

1. Purpose

To document the outcomes of the risk assessment conducted as per OP-07 Risk Assessment.

2. Definitions

Critical Control Point (CCP) – An essential step or point in the subject system at which control can be applied by the Operating Authority to prevent or eliminate a drinking water health hazard or reduce it to an acceptable level

Critical Control Limit (CCL) – The point at which a Critical Control Point response procedure is initiated

3. Procedure

3.1 The QEMS Representative is responsible for updating the information in OP-08A Summary of Risk Assessment Outcomes as required.

3.2 The results of the risk assessment conducted as per OP-07 are documented in Table 1 of OP-08A. This includes:

- Identified potential hazardous events and associated hazards (possible outcomes) for each of the system's activities/process steps;
  Note: Hazards listed in the Ministry's "Potential Hazardous Events for Municipal Residential Drinking Water Systems" (as amended) are indicated in the appropriate column using the reference numbers in Table 4 of OP-08A.
- Identified control measures to address the potential hazards and hazardous events; and
- Assigned rankings for the hazardous events (likelihood x consequence = risk value) and whether the hazardous event is a Critical Control Point (CCP) (mandatory or additional).
  Note: If the hazardous event is ranked as 12 or higher and it is <u>not</u> being identified as a CCP, provide rationale as to why it does not meet the criteria set out in section 3.3.7 of OP-07).

3.3 Operations Management is responsible for ensuring that for each CCP:

- Critical Control Limits (CCLs) are set;
- Procedures and processes to monitor the CCLs are established; and
- Procedures to respond to, report and record deviations from the CCLs are implemented.

The identified CCPs, their respective CCLs and associated procedures are documented in Table 2 of OP-08A.

3.4 A summary of the results of the annual review/36-month risk assessment is recorded in Table 3 of OP-08A.

3.5 Operations Management considers the risk assessment outcomes during the review of the adequacy of the infrastructure (Refer to OP-14 Review and Provision of Infrastructure).

4. Related Documents

OP-07 Risk Assessment
OP-08A Summary of Risk Assessment Outcomes
OP-14 Review and Provision of Infrastructure
Ministry's "Potential Hazardous Events for Municipal Residential Drinking Water Systems" (as amended)

5. Revision History

Date	Revision #	Reason for Revision
2024-11-18	0	Procedure issued

SUMMARY OF RISK ASSESSMENT OUTCOMES

Reviewed by: QEMS Representative | Approved by: Operations Management

Table 1: Risk Assessment Table

Note: Processes referred to in section 3.3.4 of OP-07 Risk Assessment must be identified as mandatory Critical Control Points (CCPs) as applicable. Mandatory CCPs are not required to be ranked.

Activity/ Process Step	Ministry's Potential Hazardous Event/Hazard Reference # (see Table 4)	Description of Hazardous Event	Possible Outcome (Hazards)	Existing Control Measures	Likelihood	Consequence	Risk Value	CCP?
Raw Water Source	1, 5, 6, 9	Chemical, biological, radioactive spill in Well Protection Area	Contamination of source water	-Source Water Protection Plan -SOP: Reporting Adverse Water Quality -SOP: Provision of Alternate Source of Water -CP: Unsafe Water -CP: Loss of Service	1	3	3	☐ ☒No – no control available at this point; therefore not a CCP
	1, 6, 9	E. coli and/or Total Coliform Detected	Contamination of source water	-Well Inspection Plan -Routine Monitoring -SOP: Reporting Adverse Water Quality -SOP: Provision of Alternate Source of Water -CP: Unsafe Water -CP: Loss of Service	1	3	3	☐ ☒No – no control available at this point; therefore not a CCP
	2, 6	Well Pump Failure	Low Pressure Loss of Source Water	-Alternative well supply -Routine Maintenance -Distribution Storage -SOP: Low Distribution System Pressure	3	3	9	☐ ☒ No – no control available at this point; therefore not a CCP

SUMMARY OF RISK ASSESSMENT OUTCOMES

Reviewed by: QEMS Representative | Approved by: Operations Management

Activity/ Process Step	Ministry's Potential Hazardous Event/Hazard Reference # (see Table 4)	Description of Hazardous Event	Possible Outcome (Hazards)	Existing Control Measures	Likelihood	Consequence	Risk Value	CCP?
				-SOP: Provision of Alternate Source of Water -CP: Unsafe Water -CP: Loss of Service				
	2, 6	Structural Well Failure	Loss of Source Water Contamination	-Well Inspection Plan -Routine Monitoring -SOP: Reporting Adverse Water Quality -SOP: Provision of Alternate Source of Water -CP: Unsafe Water -CP: Loss of Service	2	3	6	☐ ☒ No – no control available at this point; therefore not a CCP
Primary Disinfection	2, 7, 10	Structural Failure in Reservoir	Contamination Loss of CT	-Reservoir Inspection Plan -SOP: Reporting Adverse Water Quality -SOP: Provision of Alternate Source of Water -CP: Unsafe Water -CP: Loss of Service	2	4	8	☐ ☒ No – no control available at this point; therefore not a CCP
	3, 6, 11	Low Chlorine	Not Meeting CT requirements	-Standby CFP -Alarms -Routine Monitoring	4	3	12	☒ Yes – Mandatory CCP ☐

SUMMARY OF RISK ASSESSMENT OUTCOMES

Reviewed by: QEMS Representative | Approved by: Operations Management

Activity/ Process Step	Ministry's Potential Hazardous Event/Hazard Reference # (see Table 4)	Description of Hazardous Event	Possible Outcome (Hazards)	Existing Control Measures	Likelihood	Consequence	Risk Value	CCP?
				-SOP: Reporting Adverse Water Quality -SOP: Provision of Alternate Source of Water -SOP: Primary Disinfection -CP: Unsafe Water				
	2, 6, 10	Low Reservoir Level	Not Meeting CT Requirements	-Alarms -Routine Monitoring -SOP: Reporting Adverse Water Quality -SOP: Provision of Alternate Source of Water -SOP: Primary Disinfection -CP: Unsafe Water	3	3	9	☒ Yes – Mandatory CCP
	10	High Flow	Exceeding PTTW and/or not meeting CT Requirements	-Routine Monitoring -SOP: Reporting Adverse Water Quality -SOP: Provision of Alternate Source of Water -SOP: Primary Disinfection -CP: Unsafe Water	3	3	9	☒ Yes – Mandatory CCP
Distribution	4, 6	Watermain Break	Low Pressure Loss of Water Supply Contamination	-Isolation to limit affected area ---- SOP: Watermain Repair -SOP: Reporting Adverse Water Quality	3	3	9	☐ ☒ No – no control available at this point; therefore not a CCP

SUMMARY OF RISK ASSESSMENT OUTCOMES

Reviewed by: QEMS Representative | Approved by: Operations Management

Activity/ Process Step	Ministry's Potential Hazardous Event/Hazard Reference # (see Table 4)	Description of Hazardous Event	Possible Outcome (Hazards)	Existing Control Measures	Likelihood	Consequence	Risk Value	CCP?
				-SOP: Low Distribution System Pressure -CP: Unsafe Water -CP: Loss of Service				
	6, 8	Failure of Backflow	Contamination	-SOP: Reporting Adverse Water Quality -CP: Unsafe Water	3	3	9	☐ ☒ No – no control available at this point; therefore not a CCP
	6	Illegal Fire Hydrant Use	Contamination	-SOP: Reporting Adverse Water Quality -CP: Unsafe Water	3	3	9	☐ ☒ No – no control available at this point; therefore not a CCP
	6	Illegal Connections	Cross Connection Contamination	-Bylaw 2020-32 -SOP: Reporting Adverse Water Quality -CP: Unsafe Water	2	3	6	☒ No – no control available at this point; therefore not a CCP
	6	Structural Failure in Tower	Low Pressure Contamination	-Alarms -Reservoir Inspection Plan -SOP: Reporting Adverse Water Quality -SOP: Low Distribution System Pressure -CP: Unsafe Water -CP: Loss of Service	1	3	3	☐ ☒ No – no control available at this point; therefore not a CCP

SUMMARY OF RISK ASSESSMENT OUTCOMES

Reviewed by: QEMS Representative | Approved by: Operations Management

Activity/ Process Step	Ministry's Potential Hazardous Event/Hazard Reference # (see Table 4)	Description of Hazardous Event	Possible Outcome (Hazards)	Existing Control Measures	Likelihood	Consequence	Risk Value	CCP?
	8	Adverse result on distribution sample	AWQI	-SOP: Reporting Adverse Water Quality -CP: Unsafe Water	3	4	12	☐ ☒ No – no control available at this point; therefore not a CCP
	4, 11	Low Chlorine	AWQI	-Routine monitoring -SOP: Reporting Adverse Water Quality -CP: Unsafe Water	3	3	9	☐ Yes – Mandatory CCP ☐
Failure of Monitoring Equipment	10, 11, 13	Failure of Continuous Monitoring	Non-compliance with regulatory requirements	-Back up data on Chlorine Analyzers -SOP: Review of Continuous Monitoring Equipment -CP: Security Breach	3	3	9	☐ ☒ No – no control available at this point; therefore not a CCP
	3, 13	Failure of Alarm Monitoring	Contamination	-Routine Testing -back up local dialer -SOP: Reporting Adverse Water Quality -CP: Security Breach	4	3	12	☐ ☒ No – no control available at this point; therefore not a CCP
	3, 4, 6	Power Failure	Low Pressure Loss of Monitoring	-Back up generator -Alarms -SOP: Power Failure	4	2	8	☐ ☒ No – no control available at this point; therefore not a CCP

SUMMARY OF RISK ASSESSMENT OUTCOMES

Reviewed by: QEMS Representative | Approved by: Operations Management

Activity/ Process Step	Ministry's Potential Hazardous Event/Hazard Reference # (see Table 4)	Description of Hazardous Event	Possible Outcome (Hazards)	Existing Control Measures	Likelihood	Consequence	Risk Value	CCP?
				-SOP: Low Distribution System Pressure -SOP: Review of Continuous Monitoring Equipment -CP: Security Breach -CP: Loss of Service				

Table 2: Identified Critical Control Points (CCPs)

CCP	Critical Control Limits	Monitoring Procedures	Response, Reporting and Recording Procedures
Low Chlorine on Treated Water Analyzer	All wellhouses - 1.0 mg/L	-Alarm monitoring -72hr Review of Continuous Monitoring data	-Facility logbook -CP: Unsafe Water -SOP: Primary Disinfection -SOP: Reporting Adverse Water Quality
Low Reservoir Level	Point Clark – 0.8 meters Blairs Grove – 1.3 meters Murdoch Glen – 3.7 meters Huronville South – 1.6 meters	-Alarm monitoring -72hr Review of Continuous Monitoring data	-Facility logbook -CP: Unsafe Water -SOP: Primary Disinfection -SOP: Reporting Adverse Water Quality
HIgh Well Flow	Point Clark – 37.5 L/s Blairs Grove – 29.9 L/s Murdoch Glen – 21.0 L/s Huronville South – 54 L/s	-Alarm monitoring -72hr Review of Continuous Monitoring data	-Facility logbook -CP: Unsafe Water -SOP: Primary Disinfection -SOP: Reporting Adverse Water Quality

Note: Standard Operating Procedures (SOPs) referenced in Tables 1 and 2 are controlled as per OP-05 Document and Records Control.

Table 3: Record of Annual Review/36-Month Risk Assessment

The Drinking Water Quality Management Standard (DWQMS) requires that the currency of the information and the validity of the assumptions used in the risk assessment be verified at least once every calendar year. In addition, the risk assessment must be conducted at least once every thirty-six months.

Date of Activity	Type of Activity	Participants	Summary of Results
2025-05-08	Initial Risk Assessment	Katelyn Barrowcliffe, Paul Sherban, Meagan Lowden, Cindy Sigurdson	Results captured in Revision 0 of this Summary of Risk Assessment Outcomes

Table 4: Potential Hazardous Event/Hazard Reference Numbers (based on the Ministry's "Potential Hazardous Events for Municipal Residential Drinking Water Systems" dated April 2022)

If the hazardous event/hazard is not applicable to this drinking water system (DWS), it will be noted in the first column of this table.

System Type (indicate all that apply to this DWS)		Reference Number	Description of Hazardous Event/Hazard
X	All Systems	1	Long Term Impacts of Climate Change
X	All Systems	2	Water supply shortfall
X	All Systems	3	Extreme weather events (e.g., tornado, ice storm)
X	All Systems	4	Sustained extreme temperatures (e.g., heat wave, deep freeze)
X	All Systems	5	Chemical spill impacting source water
X	All Systems	6	Terrorist and vandalism actions
X	Distribution Systems	7	Sustained pressure loss
X	Distribution Systems	8	Backflow
X	Treatment Systems	9	Sudden changes to raw water characteristics (e.g., turbidity, pH)
X	Treatment Systems	10	Failure of equipment or process associated with primary disinfection (e.g., coagulant dosing system, filters, UV system, chlorination system)

X	Treatment Systems and Distribution Systems providing secondary disinfection	11	Failure of equipment or process associated with secondary disinfection (e.g., chlorination equipment, chloramination equipment)
N/A	Treatment Systems using Surface Water	12	Algal blooms
X	All Systems	13	Cybersecurity threats

Revision History

Date	Revision #	Reason for Revision
2025-05-08	0	Initial risk assessment conducted
2025-06-25	1	Identified high flow in the summary table as a CCP, as it was identified incorrectly
2025-07-03	2	Added identified CCP’s to table 2 for high well flows

SUMMARY OF RISK ASSESSMENT OUTCOMES

Reviewed by: QEMS Representative | Approved by: Operations Management

Table 1: Risk Assessment Table

Note: Processes referred to in section 3.3.4 of OP-07 Risk Assessment must be identified as mandatory Critical Control Points (CCPs) as applicable. Mandatory CCPs are not required to be ranked.

Activity/ Process Step	Ministry's Potential Hazardous Event/Hazard Reference # (see Table 4)	Description of Hazardous Event	Possible Outcome (Hazards)	Existing Control Measures	Likelihood	Consequence	Risk Value	CCP?
Raw Water Source	1, 5, 6, 9	Chemical, biological, radioactive spill in Well Protection Area	Contamination of source water	-Source Water Protection Plan -SOP: Reporting Adverse Water Quality -SOP: Provision of Alternate Source of Water -CP: Unsafe Water -CP: Loss of Service	1	3	3	☒ No – no control available at this point; therefore not a CCP
	1, 6, 9	E. coli and/or Total Coliform Detected	Contamination of source water	-Well Inspection Plan -Routine Monitoring -SOP: Reporting Adverse Water Quality -SOP: Provision of Alternate Source of Water -CP: Unsafe Water -CP: Loss of Service	1	3	3	☒ No – no control available at this point; therefore not a CCP
	2, 6	Well Pump Failure	Low Pressure Loss of Source Water	-Alternative well supply -Routine Maintenance -Distribution Storage -SOP: Low Distribution System Pressure	3	3	9	☒ No– no control available at this point; therefore not a CCP

SUMMARY OF RISK ASSESSMENT OUTCOMES

Reviewed by: QEMS Representative | Approved by: Operations Management

Activity/ Process Step	Ministry's Potential Hazardous Event/Hazard Reference # (see Table 4)	Description of Hazardous Event	Possible Outcome (Hazards)	Existing Control Measures	Likelihood	Consequence	Risk Value	CCP?
				-SOP: Provision of Alternate Source of Water -CP: Unsafe Water -CP: Loss of Service				
	2, 6	Structural Well Failure	Loss of Source Water Contamination	-Well Inspection Plan -Routine Monitoring -SOP: Reporting Adverse Water Quality -SOP: Provision of Alternate Source of Water -CP: Unsafe Water -CP: Loss of Service	2	3	6	☒ No – no control available at this point; therefore not a CCP
Primary Disinfection	2, 7, 10	Structural Failure in Reservoir	Contamination Loss of CT	-Reservoir Inspection Plan -SOP: Reporting Adverse Water Quality -SOP: Provision of Alternate Source of Water -CP: Unsafe Water -CP: Loss of Service	2	4	8	☒ No – no control available at this point; therefore not a CCP
	3, 6, 11	Low Chlorine	Not Meeting CT requirements	-Standby CFP -Alarms -Routine Monitoring	4	3	12	☒ Yes – Mandatory CCP

SUMMARY OF RISK ASSESSMENT OUTCOMES

Reviewed by: QEMS Representative | Approved by: Operations Management

Activity/ Process Step	Ministry's Potential Hazardous Event/Hazard Reference # (see Table 4)	Description of Hazardous Event	Possible Outcome (Hazards)	Existing Control Measures	Likelihood	Consequence	Risk Value	CCP?
				-SOP: Reporting Adverse Water Quality -SOP: Provision of Alternate Source of Water -SOP: Primary Disinfection -CP: Unsafe Water				
	2, 6, 10	Low Reservoir Level	Not Meeting CT Requirements	-Alarms -Routine Monitoring -SOP: Reporting Adverse Water Quality -SOP: Provision of Alternate Source of Water -SOP: Primary Disinfection -CP: Unsafe Water	3	3	9	☒ Yes – Mandatory CCP
	10	High Flow	Exceeding PTTW and/or not meeting CT Requirements	-Alarms -Routine Monitoring -SOP: Reporting Adverse Water Quality -SOP: Provision of Alternate Source of Water -SOP: Primary Disinfection -CP: Unsafe Water	3	3	9	☒ No – no control
Distribution	4, 6	Watermain Break	Low Pressure Loss of Water Supply Contamination	-Isolation to limit affected area ---- -SOP: Watermain Repair -SOP: Reporting Adverse Water Quality	3	3	9	☒ No – no control available at this point; therefore not a CCP

SUMMARY OF RISK ASSESSMENT OUTCOMES

Reviewed by: QEMS Representative | Approved by: Operations Management

Activity/ Process Step	Ministry's Potential Hazardous Event/Hazard Reference # (see Table 4)	Description of Hazardous Event	Possible Outcome (Hazards)	Existing Control Measures	Likelihood	Consequence	Risk Value	CCP?
				-SOP: Low Distribution System Pressure -CP: Unsafe Water -CP: Loss of Service				
	6	Failure of Backflow	Contamination	-Bylaw 2020-32 -SOP: Reporting Adverse Water Quality -CP: Unsafe Water	3	3	9	☒ No – no control available at this point; therefore not a CCP
	6	Illegal Fire Hydrant Use	Contamination	-Bylaw 2020-32 -SOP: Reporting Adverse Water Quality -CP: Unsafe Water	3	3	9	☒ No – no control available at this point; therefore not a CCP
	6	Illegal Connections	Cross Connection Contamination	-Bylaw 2020-32 -SOP: Reporting Adverse Water Quality -CP: Unsafe Water	2	3	6	☒ No – no control available at this point; therefore not a CCP
	6	Structural Failure in Tower	Low Pressure Contamination	-Alarms -Reservoir Inspection Plan -SOP: Reporting Adverse Water Quality -SOP: Low Distribution System Pressure	1	3	3	☒ No – no control available at this point; therefore not a CCP

SUMMARY OF RISK ASSESSMENT OUTCOMES

Reviewed by: QEMS Representative | Approved by: Operations Management

Activity/ Process Step	Ministry's Potential Hazardous Event/Hazard Reference # (see Table 4)	Description of Hazardous Event	Possible Outcome (Hazards)	Existing Control Measures	Likelihood	Consequence	Risk Value	CCP?
				-CP: Unsafe Water -CP: Loss of Service				
	8	Adverse result on distribution sample	AWQI	-SOP: Reporting Adverse Water Quality -CP: Unsafe Water	3	4	12	☒ No – no control available at this point; therefore not a CCP
	4, 11	Low Chlorine	AWQI	-Routine monitoring -SOP: Reporting Adverse Water Quality -CP: Unsafe Water	3	3	9	☒ Yes – Mandatory CCP
Monitoring Equipment	10, 11, 13	Failure of Continuous Monitoring	Non-compliance with regulatory requirements	-Back up data on Chlorine Analyzers -SOP: Review of Continuous Monitoring Equipment -CP: Security Breach	3	3	9	☒ No – no control available at this point; therefore not a CCP
	3, 13	Failure of Alarm Monitoring	Contamination	-Routine Testing -SOP: Reporting Adverse Water Quality -CP: Security Breach	4	3	12	☒ No – no control available at this point; therefore not a CCP
	3, 4, 6	Power Failure	Low Pressure Loss of Monitoring	-Back up generator -SOP: Power Failure	4	2	8	☒ No – no control available at this point; therefore not a CCP

SUMMARY OF RISK ASSESSMENT OUTCOMES

Reviewed by: QEMS Representative | Approved by: Operations Management

Activity/ Process Step	Ministry's Potential Hazardous Event/Hazard Reference # (see Table 4)	Description of Hazardous Event	Possible Outcome (Hazards)	Existing Control Measures	Likelihood	Consequence	Risk Value	CCP?
				-SOP: Low Distribution System Pressure -SOP: Review of Continuous Monitoring Equipment -CP: Security Breach -CP: Loss of Service				

Table 2: Identified Critical Control Points (CCPs)

CCP	Critical Control Limits	Monitoring Procedures	Response, Reporting and Recording Procedures
Low Chlorine on Treated Water Analyzer	Ripley Wellhouse and Ripley Tower – 1.00 mg/L	-Alarm monitoring -72hr Review of Continuous Monitoring data	-Facility logbook -CP: Unsafe Water -SOP: Primary Disinfection -SOP: Reporting Adverse Water Quality
Low Reservoir Level	Ripley Wellhouse – 1.6 meters	-Alarm monitoring -72hr Review of Continuous Monitoring data	-Facility logbook -CP: Unsafe Water -SOP: Primary Disinfection -SOP: Reporting Adverse Water Quality
High Flow	Ripley ET – Well 3: 24 l/s Well 4: 23 l/s	-Alarm monitoring -72hr Review of Continuous Monitoring data	-Facility logbook -CP: Unsafe Water -SOP: Primary Disinfection -SOP: Reporting Adverse Water Quality

Note: Standard Operating Procedures (SOPs) referenced in Tables 1 and 2 are controlled as per OP-05 Document and Records Control.

Table 3: Record of Annual Review/36-Month Risk Assessment

The Drinking Water Quality Management Standard (DWQMS) requires that the currency of the information and the validity of the assumptions used in the risk assessment be verified at least once every calendar year. In addition, the risk assessment must be conducted at least once every thirty-six months.

Date of Activity	Type of Activity	Participants	Summary of Results
2025-05-08	Initial Risk Assessment	Katelyn Barrowcliffe, Paul Sherban, Meagan Lowden, Cindy Sigurdson	Results captured in Revision 0 of this Summary of Risk Assessment Outcomes

Table 4: Potential Hazardous Event/Hazard Reference Numbers (based on the Ministry's "Potential Hazardous Events for Municipal Residential Drinking Water Systems" dated April 2022)

If the hazardous event/hazard is not applicable to this drinking water system (DWS), it will be noted in the first column of this table.

System Type (indicate all that apply to this DWS)		Reference Number	Description of Hazardous Event/Hazard
X	All Systems	1	Long Term Impacts of Climate Change
X	All Systems	2	Water supply shortfall
X	All Systems	3	Extreme weather events (e.g., tornado, ice storm)
X	All Systems	4	Sustained extreme temperatures (e.g., heat wave, deep freeze)
X	All Systems	5	Chemical spill impacting source water
X	All Systems	6	Terrorist and vandalism actions
X	Distribution Systems	7	Sustained pressure loss
X	Distribution Systems	8	Backflow
X	Treatment Systems	9	Sudden changes to raw water characteristics (e.g., turbidity, pH)
X	Treatment Systems	10	Failure of equipment or process associated with primary disinfection (e.g., coagulant dosing system, filters, UV system, chlorination system)

SUMMARY OF RISK ASSESSMENT OUTCOMES

Reviewed by: QEMS Representative	Approved by: Operations Management

X	Treatment Systems and Distribution Systems providing secondary disinfection	11	Failure of equipment or process associated with secondary disinfection (e.g., chlorination equipment, chloramination equipment)
N/A	Treatment Systems using Surface Water	12	Algal blooms
X	All Systems	13	Cybersecurity threats

Revision History

Date	Revision #	Reason for Revision
2025-05-08	0	Initial risk assessment conducted

SUMMARY OF RISK ASSESSMENT OUTCOMES

Reviewed by: QEMS Representative | Approved by: Operations Management

Table 1: Risk Assessment Table

Note: Processes referred to in section 3.3.4 of OP-07 Risk Assessment must be identified as mandatory Critical Control Points (CCPs) as applicable. Mandatory CCPs are not required to be ranked.

Activity/ Process Step	Ministry's Potential Hazardous Event/Hazard Reference # (see Table 4)	Description of Hazardous Event	Possible Outcome (Hazards)	Existing Control Measures	Likelihood	Consequence	Risk Value	CCP?
Raw Water Source	1, 5, 6, 9	Chemical, biological, radioactive spill in Well Protection Area	Contamination of source water	-Source Water Protection Plan -SOP: Reporting Adverse Water Quality -SOP: Provision of Alternate Source of Water -CP: Unsafe Water -CP: Loss of Service	1	3	3	☒ No – no control available at this point; therefore not a CCP
	1, 6, 9	E. coli and/or Total Coliform Detected	Contamination of source water	-Well Inspection Plan -Routine Monitoring -SOP: Reporting Adverse Water Quality -SOP: Provision of Alternate Source of Water -CP: Unsafe Water -CP: Loss of Service	1	3	3	☒ No – no control available at this point; therefore not a CCP
	2, 6	Well Pump Failure	Low Pressure Loss of Source Water	-Alternative well supply -Routine Maintenance -Distribution Storage -SOP: Low Distribution System Pressure	3	3	9	☒ No – no control available at this point; therefore not a CCP

SUMMARY OF RISK ASSESSMENT OUTCOMES

Reviewed by: QEMS Representative | Approved by: Operations Management

Activity/ Process Step	Ministry's Potential Hazardous Event/Hazard Reference # (see Table 4)	Description of Hazardous Event	Possible Outcome (Hazards)	Existing Control Measures	Likelihood	Consequence	Risk Value	CCP?
				-SOP: Provision of Alternate Source of Water -CP: Unsafe Water -CP: Loss of Service				
	2, 6	Structural Well Failure	Loss of Source Water Contamination	-Well Inspection Plan -Routine Monitoring -SOP: Reporting Adverse Water Quality -SOP: Provision of Alternate Source of Water -CP: Unsafe Water -CP: Loss of Service	2	3	6	☒ No – no control available at this point; therefore not a CCP
Primary Disinfection								
	3, 6, 11	Low Chlorine	Not Meeting CT requirements	-Standby CFP -Alarms -Routine Monitoring -SOP: Reporting Adverse Water Quality -SOP: Provision of Alternate Source of Water -SOP: Primary Disinfection -CP: Unsafe Water	4	3	12	☒ Yes – Mandatory CCP

SUMMARY OF RISK ASSESSMENT OUTCOMES

Reviewed by: QEMS Representative | Approved by: Operations Management

Activity/ Process Step	Ministry's Potential Hazardous Event/Hazard Reference # (see Table 4)	Description of Hazardous Event	Possible Outcome (Hazards)	Existing Control Measures	Likelihood	Consequence	Risk Value	CCP?
	10	High Flow	Exceeding PTTW and/or not meeting CT Requirements	-Alarms -Routine Monitoring -SOP: Reporting Adverse Water Quality -SOP: Provision of Alternate Source of Water -SOP: Primary Disinfection -CP: Unsafe Water	3	3	9	☒ No – no control
Distribution	4, 6	Watermain Break	Low Pressure Loss of Water Supply Contamination	-Isolation to limit affected area ---- -SOP: Watermain Repair -SOP: Reporting Adverse Water Quality -SOP: Low Distribution System Pressure -CP: Unsafe Water -CP: Loss of Service	3	3	9	☒ No – no control available at this point; therefore not a CCP
	6,8	Failure of Backflow	Contamination	-Bylaw 2020-32 -SOP: Reporting Adverse Water Quality -CP: Unsafe Water	3	3	9	☒ No – no control available at this point; therefore not a CCP
	6	Illegal Fire Hydrant Use	Contamination	-Bylaw 2020-32 -SOP: Reporting Adverse Water Quality -CP: Unsafe Water	3	3	9	☒ No – no control available at this point; therefore not a CCP

SUMMARY OF RISK ASSESSMENT OUTCOMES

Reviewed by: QEMS Representative | Approved by: Operations Management

Activity/ Process Step	Ministry's Potential Hazardous Event/Hazard Reference # (see Table 4)	Description of Hazardous Event	Possible Outcome (Hazards)	Existing Control Measures	Likelihood	Consequence	Risk Value	CCP?
	6	Illegal Connections	Cross Connection Contamination	-Bylaw 2020-32 -SOP: Reporting Adverse Water Quality -CP: Unsafe Water	2	3	6	☒No – no control available at this point; therefore not a CCP
	6	Structural Failure in Tower	Low Pressure Contamination	-Alarms -Reservoir Inspection Plan -SOP: Reporting Adverse Water Quality -SOP: Low Distribution System Pressure -CP: Unsafe Water -CP: Loss of Service	1	3	3	☒ No – no control available at this point; therefore not a CCP
	8	Adverse result on distribution sample	AWQI	-SOP: Reporting Adverse Water Quality -CP: Unsafe Water	3	4	12	☒ No – no control available at this point; therefore not a CCP
	4, 11	Low Chlorine	AWQI	-Routine monitoring -SOP: Reporting Adverse Water Quality -CP: Unsafe Water	3	3	9	☒ Yes – Mandatory CCP

SUMMARY OF RISK ASSESSMENT OUTCOMES

Reviewed by: QEMS Representative | Approved by: Operations Management

Activity/ Process Step	Ministry's Potential Hazardous Event/Hazard Reference # (see Table 4)	Description of Hazardous Event	Possible Outcome (Hazards)	Existing Control Measures	Likelihood	Consequence	Risk Value	CCP?
Monitoring Equipment	10, 11, 13	Failure of Continuous Monitoring	Non-compliance with regulatory requirements	-Back up data on Chlorine Analyzers -SOP: Review of Continuous Monitoring Equipment -CP: Security Breach	3	3	9	☒ No – no control available at this point; therefore not a CCP
	3, 13	Failure of Alarm Monitoring	Contamination	-Routine Testing -back up local dialer -SOP: Reporting Adverse Water Quality -CP: Security Breach	4	3	12	☒ No – no control available at this point; therefore not a CCP
	3, 4, 6	Power Failure	Low Pressure Loss of Monitoring	-Back up generator -SOP: Power Failure -SOP: Low Distribution System Pressure -SOP: Review of Continuous Monitoring Equipment -CP: Security Breach -CP: Loss of Service	4	2	8	☒ No – no control available at this point; therefore not a CCP

Table 2: Identified Critical Control Points (CCPs)

CCP	Critical Control Limits	Monitoring Procedures	Response, Reporting and Recording Procedures

Low Chlorine on Treated Water Analyzer	Well 4 and Well 5 – 1.00 mg/l	-Alarm monitoring -72hr Review of Continuous Monitoring data	-Facility logbook -CP: Unsafe Water -SOP: Primary Disinfection -SOP: Reporting Adverse Water Quality
High Flow	Lucknow 4 – 14 l/s Lucknow 5 – 44 l/s	-Alarm monitoring -72hr Review of Continuous Monitoring data	-Facility logbook -CP: Unsafe Water -SOP: Primary Disinfection -SOP: Reporting Adverse Water Quality

Note: Standard Operating Procedures (SOPs) referenced in Tables 1 and 2 are controlled as per OP-05 Document and Records Control.

Table 3: Record of Annual Review/36-Month Risk Assessment

The Drinking Water Quality Management Standard (DWQMS) requires that the currency of the information and the validity of the assumptions used in the risk assessment be verified at least once every calendar year. In addition, the risk assessment must be conducted at least once every thirty-six months.

Date of Activity	Type of Activity	Participants	Summary of Results
2025-05-08	Initial Risk Assessment	Katelyn Barrowcliffe, Paul Sherban, Meagan Lowden, Cindy Sigurdson	Results captured in Revision 0 of this Summary of Risk Assessment Outcomes

Table 4: Potential Hazardous Event/Hazard Reference Numbers (based on the Ministry's "Potential Hazardous Events for Municipal Residential Drinking Water Systems" dated April 2022)

If the hazardous event/hazard is not applicable to this drinking water system (DWS), it will be noted in the first column of this table.

System Type (indicate all that apply to this DWS)	Reference Number	Description of Hazardous Event/Hazard

SUMMARY OF RISK ASSESSMENT OUTCOMES

Reviewed by: QEMS Representative	Approved by: Operations Management

X	All Systems	1	Long Term Impacts of Climate Change
X	All Systems	2	Water supply shortfall
X	All Systems	3	Extreme weather events (e.g., tornado, ice storm)
X	All Systems	4	Sustained extreme temperatures (e.g., heat wave, deep freeze)
X	All Systems	5	Chemical spill impacting source water
X	All Systems	6	Terrorist and vandalism actions
X	Distribution Systems	7	Sustained pressure loss
X	Distribution Systems	8	Backflow
X	Treatment Systems	9	Sudden changes to raw water characteristics (e.g., turbidity, pH)
X	Treatment Systems	10	Failure of equipment or process associated with primary disinfection (e.g., coagulant dosing system, filters, UV system, chlorination system)
X	Treatment Systems and Distribution Systems providing secondary disinfection	11	Failure of equipment or process associated with secondary disinfection (e.g., chlorination equipment, chloramination equipment)
N/A	Treatment Systems using Surface Water	12	Algal blooms
X	All Systems	13	Cybersecurity threats

Revision History

Date	Revision #	Reason for Revision
2025-05-08	0	Initial risk assessment conducted
2025-06-25	1	Removed reservoir structure failure from summary as there are no reservoirs in Lucknow DWS

SUMMARY OF RISK ASSESSMENT OUTCOMES

Reviewed by: QEMS Representative | Approved by: Operations Management

Table 1: Risk Assessment Table

Note: Processes referred to in section 3.3.4 of OP-07 Risk Assessment must be identified as mandatory Critical Control Points (CCPs) as applicable. Mandatory CCPs are not required to be ranked.

Activity/ Process Step	Ministry's Potential Hazardous Event/Hazard Reference # (see Table 4)	Description of Hazardous Event	Possible Outcome (Hazards)	Existing Control Measures	Likelihood	Consequence	Risk Value	CCP?
Raw Water Source	1, 5, 6, 9	Chemical, biological, radioactive spill in Well Protection Area	Contamination of source water	-Source Water Protection Plan -SOP: Reporting Adverse Water Quality -SOP: Provision of Alternate Source of Water -CP: Unsafe Water -CP: Loss of Service	1	3	3	☒ No – no control available at this point; therefore not a CCP
	1, 6, 9	E. coli and/or Total Coliform Detected	Contamination of source water	-Well Inspection Plan -Routine Monitoring -SOP: Reporting Adverse Water Quality -SOP: Provision of Alternate Source of Water -CP: Unsafe Water -CP: Loss of Service	1	3	3	☒ No – no control available at this point; therefore not a CCP
	2, 6	Well Pump Failure	Low Pressure Loss of Source Water	-Alternative well supply -Routine Maintenance -Distribution Storage -SOP: Low Distribution System Pressure	3	3	9	☒ No – no control available at this point; therefore not a CCP

SUMMARY OF RISK ASSESSMENT OUTCOMES

Reviewed by: QEMS Representative | Approved by: Operations Management

Activity/ Process Step	Ministry's Potential Hazardous Event/Hazard Reference # (see Table 4)	Description of Hazardous Event	Possible Outcome (Hazards)	Existing Control Measures	Likelihood	Consequence	Risk Value	CCP?
				-SOP: Provision of Alternate Source of Water -CP: Unsafe Water -CP: Loss of Service				
	2, 6	Structural Well Failure	Loss of Source Water Contamination	-Well Inspection Plan -Routine Monitoring -SOP: Reporting Adverse Water Quality -SOP: Provision of Alternate Source of Water -CP: Unsafe Water -CP: Loss of Service	2	3	6	☒ No – no control available at this point; therefore not a CCP
Primary Disinfection	3, 6, 11	Low Chlorine	Not Meeting CT requirements	-Standby CFP -Alarms -Routine Monitoring -SOP: Reporting Adverse Water Quality -SOP: Provision of Alternate Source of Water -SOP: Primary Disinfection -CP: Unsafe Water	4	3	12	☒ Yes – Mandatory CCP
	10	High Flow	Exceeding PTTW and/or not meeting CT Requirements	-Alarms -Routine Monitoring	3	3	9	☒ No – no control

SUMMARY OF RISK ASSESSMENT OUTCOMES

Reviewed by: QEMS Representative | Approved by: Operations Management

Activity/ Process Step	Ministry's Potential Hazardous Event/Hazard Reference # (see Table 4)	Description of Hazardous Event	Possible Outcome (Hazards)	Existing Control Measures	Likelihood	Consequence	Risk Value	CCP?
				-SOP: Reporting Adverse Water Quality -SOP: Provision of Alternate Source of Water -SOP: Primary Disinfection -CP: Unsafe Water				
Distribution	4, 6	Watermain Break	Low Pressure Loss of Water Supply Contamination	-Isolation to limit affected area ---- -SOP: Watermain Repair -SOP: Reporting Adverse Water Quality -SOP: Low Distribution System Pressure -CP: Unsafe Water -CP: Loss of Service	3	3	9	☒ No – no control available at this point; therefore not a CCP
	6	Failure of Backflow	Contamination	-Bylaw 2020-32 -SOP: Reporting Adverse Water Quality -CP: Unsafe Water	3	3	9	☒ No – no control available at this point; therefore not a CCP
	6	Illegal Fire Hydrant Use	Contamination	-Bylaw 2020-32 -SOP: Reporting Adverse Water Quality -CP: Unsafe Water	3	3	9	☒ No – no control available at this point; therefore not a CCP

SUMMARY OF RISK ASSESSMENT OUTCOMES

Reviewed by: QEMS Representative | Approved by: Operations Management

Activity/ Process Step	Ministry's Potential Hazardous Event/Hazard Reference # (see Table 4)	Description of Hazardous Event	Possible Outcome (Hazards)	Existing Control Measures	Likelihood	Consequence	Risk Value	CCP?
	6	Illegal Connections	Cross Connection Contamination	-Bylaw 2020-32 -SOP: Reporting Adverse Water Quality -CP: Unsafe Water	2	3	6	☒ No – no control available at this point; therefore not a CCP
	8	Adverse result on distribution sample	AWQI	-SOP: Reporting Adverse Water Quality -CP: Unsafe Water	2	4	12	☐ Yes – Mandatory CCP ☐ Yes – Additional CCP identified for facility ☒ No – no control available at this point; therefore not a CCP
	4, 11	Low Chlorine	AWQI	-Routine monitoring -SOP: Reporting Adverse Water Quality -CP: Unsafe Water	3	3	9	☒ Yes – Mandatory CCP
Monitoring Equipment	10, 11, 13	Failure of Continuous Monitoring	Non-compliance with regulatory requirements	-Back up data on Chlorine Analyzers -SOP: Review of Continuous Monitoring Equipment -CP: Security Breach	3	3	9	☒ No – no control available at this point; therefore not a CCP
	3, 13	Failure of Alarm Monitoring	Contamination	-Routine Testing -SOP: Reporting Adverse Water Quality -CP: Security Breach	4	3	12	☒ No – no control available at this point; therefore not a CCP

SUMMARY OF RISK ASSESSMENT OUTCOMES

Reviewed by: QEMS Representative | Approved by: Operations Management

Activity/ Process Step	Ministry's Potential Hazardous Event/Hazard Reference # (see Table 4)	Description of Hazardous Event	Possible Outcome (Hazards)	Existing Control Measures	Likelihood	Consequence	Risk Value	CCP?
	3, 4, 6	Power Failure	Low Pressure Loss of Monitoring	-Back up generator -SOP: Power Failure -SOP: Low Distribution System Pressure -SOP: Review of Continuous Monitoring Equipment -CP: Security Breach -CP: Loss of Service	4	2	8	☒ No – no control available at this point; therefore not a CCP

Table 2: Identified Critical Control Points (CCPs)

CCP	Critical Control Limits	Monitoring Procedures	Response, Reporting and Recording Procedures
Low Chlorine on Treated Water Analyzer	1.00 mg/l	-Alarm monitoring -72hr Review of Continuous Monitoring data	-Facility logbook -CP: Unsafe Water -SOP: Primary Disinfection -SOP: Reporting Adverse Water Quality
High Flow	Well 1 – 3.8 l/s Well 2 – 3.8 l/s	-Alarm monitoring -72hr Review of Continuous Monitoring data	-Facility logbook -CP: Unsafe Water -SOP: Primary Disinfection -SOP: Reporting Adverse Water Quality

Note: Standard Operating Procedures (SOPs) referenced in Tables 1 and 2 are controlled as per OP-05 Document and Records Control.

Table 3: Record of Annual Review/36-Month Risk Assessment

The Drinking Water Quality Management Standard (DWQMS) requires that the currency of the information and the validity of the assumptions used in the risk assessment be verified at least once every calendar year. In addition, the risk assessment must be conducted at least once every thirty-six months.

Date of Activity	Type of Activity	Participants	Summary of Results
2025-05-08	Initial Risk Assessment	Katelyn Barrowcliffe, Paul Sherban, Meagan Lowden, Cindy Sigurdson	Results captured in Revision 0 of this Summary of Risk Assessment Outcomes

Table 4: Potential Hazardous Event/Hazard Reference Numbers (based on the Ministry's "Potential Hazardous Events for Municipal Residential Drinking Water Systems" dated April 2022)

If the hazardous event/hazard is not applicable to this drinking water system (DWS), it will be noted in the first column of this table.

System Type (indicate all that apply to this DWS)		Reference Number	Description of Hazardous Event/Hazard
X	All Systems	1	Long Term Impacts of Climate Change
X	All Systems	2	Water supply shortfall
X	All Systems	3	Extreme weather events (e.g., tornado, ice storm)
X	All Systems	4	Sustained extreme temperatures (e.g., heat wave, deep freeze)
X	All Systems	5	Chemical spill impacting source water
X	All Systems	6	Terrorist and vandalism actions
X	Distribution Systems	7	Sustained pressure loss
X	Distribution Systems	8	Backflow
X	Treatment Systems	9	Sudden changes to raw water characteristics (e.g., turbidity, pH)
X	Treatment Systems	10	Failure of equipment or process associated with primary disinfection (e.g., coagulant dosing system, filters, UV system, chlorination system)

X	Treatment Systems and Distribution Systems providing secondary disinfection	11	Failure of equipment or process associated with secondary disinfection (e.g., chlorination equipment, chloramination equipment)
N/A	Treatment Systems using Surface Water	12	Algal blooms
X	All Systems	13	Cybersecurity threats

Revision History

Date	Revision #	Reason for Revision
2025-05-08	0	Initial risk assessment conducted

ORGANIZATIONAL STRUCTURE, ROLES, RESPONSIBILITIES AND AUTHORITIES

Reviewed by: QEMS Representative	Approved by: Operations Management

1. Purpose

To document the following for the Township of Huron-Kinloss Drinking Water Systems:

- Owner;
- Organizational structure of the Operating Authority;
- QEMS roles, responsibilities and authorities of staff, Top Management and individuals/groups that provide corporate oversight; and
- Responsibilities for conducting the Management Review

2. Definitions

Operations Management – refers to the General Manager, Senior Operations Manager and/or Operations Manager that directly oversees a facility's operations

Senior Leadership Team (SLT) – members include President and CEO, Executive Vice President and General Counsel, Vice Presidents of OCWA's business units and Regional Hub Managers

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

Operations Personnel – Employees of the drinking water system who perform various activities related to the compliance, operations and maintenance of the drinking water system that may directly affect drinking water quality

3. Procedure

3.1 Organizational Structure

The Township of Huron-Kinloss Drinking Water Systems are owned by Township of Huron-Kinloss and is represented by the Chief Administrative Officer and Director of Public Works.

The organizational structure of OCWA, the Operating Authority, is outlined in appendix OP-09A: Organizational Structure.

3.2 Top Management

Top Management for the Township of Huron-Kinloss Water Supply Systems consists of:

- Operations Management – Bluewater/Lucan Cluster
- Regional Hub Manager – Midwest Region
- Safety, Process & Compliance Manager – Midwest Region

Irrespective of other duties (see Table 9-2 below), Top Management's responsibilities and authorities include:

- Endorsing the Operational Plan as per the Commitment and Endorsement procedure (OP-03);
- Ensuring that the QEMS meets the requirements of the DWQMS;
- Ensuring staff are aware of the applicable legislative and regulatory requirements;
- Communicating the QEMS according to the Communications procedure (OP-12);
- Providing resources needed to maintain and continually improve the QEMS;
- Appointing and authorizing a QEMS Representative (OP-04); and
- Undertaking Management Reviews as per the Management Review procedure (OP-20).

Note: Specific responsibilities of the individual members of Top Management are identified in the referenced procedures.

3.3 Corporate Oversight

Roles, responsibilities and authorities for individuals/groups providing corporate oversight of OCWA's QEMS are summarized in Table 9-1 below.

Table 9-1: Corporate QEMS Roles, Responsibilities and Authorities

Role	Responsibilities and Authorities
Board of Directors	• Set the Agency's strategic direction, monitor overall performance and ensure appropriate systems and controls are in place in accordance with the Agency's governing documents • Review and approve the QEMS Policy
Senior Leadership Team (SLT)	• Establish the Agency's organizational structure and governing documents and ensure resources are in place to support strategic initiatives • Monitor and report on OCWA's operational and business performance to the Board of Directors • Review the QEMS Policy and recommend its approval to the Board • Approve corporate QEMS programs and procedures
Corporate Compliance	• Manage the QEMS Policy and corporate QEMS programs and procedures • Provide support for the local implementation of the QEMS • Monitor and report on QEMS performance and any need for improvement to SLT • Consult with the Ministry and other regulators and provide compliance support/guidance on applicable legislative, regulatory and policy requirements • Manage contract with OCWA's DWQMS accreditation body

3.4 Regional Hub Roles, Responsibilities and Authorities

QEMS roles, responsibilities and authorities of Regional Hub personnel are summarized in Table 9-2 below. This information is kept current as per the Document and Records Control procedure (OP-05) and is communicated to staff as per the Communications procedure (OP-12).

Additional duties of employees are detailed in their job specifications and in the various QEMS programs and procedures that form, or are referenced in, this Operational Plan.

Table 9-2: QEMS Roles, Responsibilities and Authorities for the Midwest Region

Role/Position	Responsibilities and Authorities
All Operations Personnel	• Perform duties in compliance with applicable legislative and regulatory requirements • Be familiar with the QEMS Policy and work in accordance with QEMS programs and procedures • Maintain operator certification (as required) • Attend/participate in training relevant to their duties under the QEMS • Document all operational activities • Identify potential hazards at their facility that could affect the environmental and/or public health and report to Operations Management • Report and act on all operational incidents • Recommend changes to improve the QEMS
Regional Hub Manager (Top Management)	• Oversee the administration and delivery of contractual water/wastewater services on a Regional Hub level • Fulfill role of Top Management • Ensure corporate QEMS programs and procedures are implemented consistently throughout the Regional Hub • Manage the planning of training programs for Regional Hub • Report to VP of Operations/SLT on the regional performance of the QEMS and any need for Agency-wide improvement
Operations Management (Top Management)	• Manage the day-to-day operations and maintenance of their assigned facilities and supervise facility staff • Fulfill role of Top Management • Ensure corporate and site-specific QEMS programs and procedures are implemented at their assigned facilities • Determine necessary action and assign resources in response to operational issues

Role/Position	Responsibilities and Authorities
	• Report to the Regional Hub Manager on facility operational performance • Ensure operational training is provided for the cluster (in consultation with the SPC Manager as required) • Act as Overall Responsible Operator (ORO) when required (based on certification). Refer to SOP - Overall Responsible Operator Designation.
Safety, Process & Compliance (SPC) Manager (Top Management)	• Supervise facility compliance staff and provide technical and program support to the Regional Hub related to process control and compliant operations • Fulfill role of Top Management • Ensure corporate/regional QEMS programs and procedures are implemented consistently throughout the Regional Hub • Assist in the development of site-specific operational procedures as required • Ensure training on applicable legislative and regulatory requirements and the QEMS is provided for the Regional Hub (in consultation with Operations Management as required) • Monitor and report to the Regional Hub Manager and Operations Management on the compliance status and QEMS performance within their Regional Hub and any need for improvement • Act as alternate QEMS Representative (when required) • May act as Operator-in-Charge (OIC) and/or ORO when required (based on certification).
Process & Compliance Technician (PCT) (QEMS Representative)	• Implement, monitor and support corporate programs relating to environmental compliance and support management by evaluating and implementing process control systems at their assigned facilities • Fulfill role of QEMS Representative (OP-04) • Monitor, evaluate and report on compliance/quality status of their assigned facilities • Implement facility-specific QEMS programs and procedures consistently at their assigned facilities • Participate in audits and inspections and assist in developing, implementing and monitoring action items to respond to findings • Report to the SPC Manager on QEMS implementation and identify the need for additional/improved processes and procedures at the Regional Hub/cluster/facility level (in consultation with the Operations Management as required)

Role/Position	Responsibilities and Authorities
	• Communicate to Owners on facility compliance and DWQMS accreditation as directed • Deliver/participate in/coordinate training including applicable legislative and regulatory requirements and the QEMS • May fulfil role of Certified Operator when required (based on certification)
Certified Operator May include the following positions: • Operations Supervisor Water & Wastewater • Water & Wastewater Operator • Water & Wastewater Operator-In-Training (OIT)	• Perform duties outlined under Operations Personnel • Monitor, maintain and operate facilities in accordance with applicable regulations, approvals and established operating procedures • Collect samples and perform laboratory tests and equipment calibrations as required • Regularly inspect operating equipment, perform routine preventive maintenance and repairs and prepare and complete work orders as assigned • Ensure records of adjustments made to the process under their responsibility, equipment operating status during their shifts and any departures from normal operations observed and actions taken are maintained within facility logs/record keeping mechanisms (as per O. Reg. 128) • Participate in facility inspections and audits • May act as OIC and/or ORO when required (based on certification). **NOTE:** OITs cannot act as OIC and/or ORO. OITs perform the above duties under the direction of the OIC/ORO and as assigned by Operations Management or designate.
Administrative Assistant	• Support the administrative functions of the Regional Hub/cluster/facility including coordinating delivery of training as directed • Assist with entering operational data (including operational training records, process data and maintenance records) into the appropriate database as directed

4. Related Documents

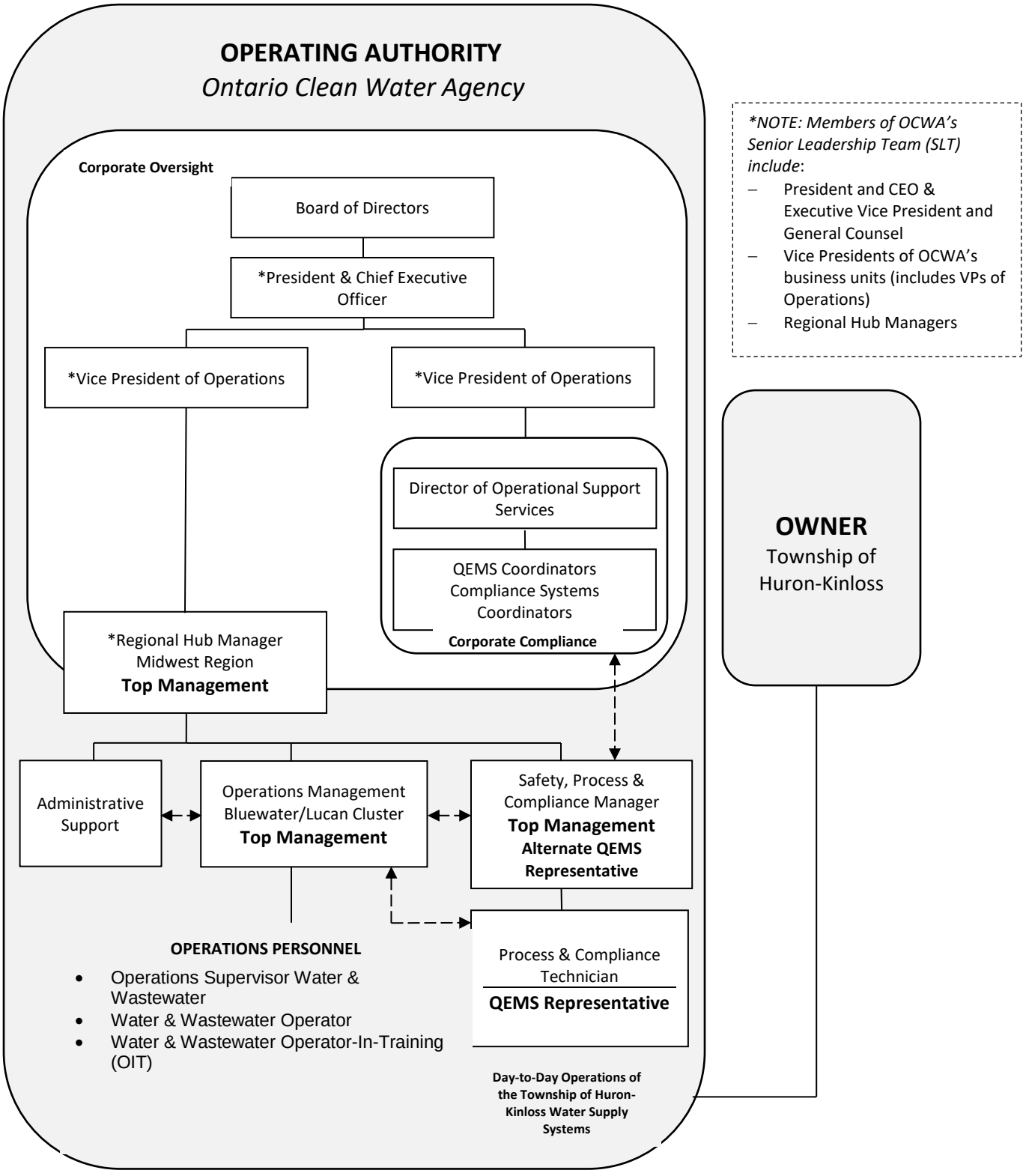
OP-03 Commitment and Endorsement
OP-04 QEMS Representative
OP-05 Document and Records Control
OP-09A Organizational Structure
OP-12 Communications
OP-20 Management Review
OCWA Position Descriptions/Job Specifications

5. Revision History

Date	Revision #	Reason for Revision
2024-11-18	0	Procedure issued
2025-06-04	1	Remove Maintenance personnel and revised Operator titles

ORGANIZATIONAL STRUCTURE

Reviewed by: QEMS Representative	Approved by: Operations Management



Revision History

Date	Revision #	Reason for Revision
2024-11-18	0	Appendix issued
2025-06-04	1	Remove Mechanic Operator, revise Operator titles

1. Purpose

To document a procedure that describes:

- the competencies required for personnel performing duties directly affecting drinking water quality;
- the activities to develop and/or maintain those competencies; and
- the activities to ensure personnel are aware of the relevance of their duties and how they affect safe drinking water.

2. Definitions

Competence – the combination of observable and measurable knowledge, skills, and abilities which are required for a person to carry out assigned responsibilities

Operations Management – refers to the General Manager, Senior Operations Manager and/or Operations Manager that directly oversees a facility's operations

Operations Personnel – employees of the drinking water system who perform various activities related to the compliance, operations and maintenance of the drinking water system that may directly affect drinking water quality

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

3. Procedure

3.1 The following table presents the minimum competencies required by operations personnel.

Role/Position	Required Minimum Competencies
Operations Management (Top Management)	• Valid operator certification; if required to act as Overall Responsible Operator (ORO), certification must be at the level of the facility or higher • Experience and/or training in managing/supervising drinking water system operations, maintenance, financial planning and administration • Training and/or experience related to drinking water system processes, principles and technologies • Training on OCWA's QEMS and the DWQMS • Training on relevant legislation, regulations, codes, policies, guidelines and procedures • Experience using computers and operational computerized systems

Role/Position	Required Minimum Competencies
Safety, Process & Compliance (SPC) Manager (Top Management) (May also fulfill the role of Alternate QEMS Representative)	• Valid operator certification required to fulfil certified operator duties (if assigned). • Experience in providing technical support and leading/managing programs related to process control and compliant operations • Experience and/or training in conducting compliance audits, and management system audits • Experience and/or training in preparing and presenting informational and training material • Training on OCWA's QEMS and the DWQMS • Training on relevant legislation, regulations, codes, policies, guidelines and procedures • Experience using computers and operational computerized systems
Process & Compliance Technician, Operations and Compliance Team Lead (QEMS Representative)	• Valid operator certification required to fulfil certified operator duties (if assigned) • Experience and/or training in resolving/addressing compliance issues for drinking water systems • Experience and/or training in monitoring, assessing and reporting on facility performance against legal requirements and corporate goals • Experience and/or training in preparing and presenting informational and training material • Experience in conducting management system audits or internal auditor education/training • Training on OCWA's QEMS and the DWQMS • Training on relevant legislation, regulations, codes, policies, guidelines and procedures • Experience using computers and operational computerized systems
Certified Operator May include the following: • Operations Supervisor Water & Wastewater • Water & Wastewater Operator • Water & Wastewater Operator-in-Training	• Valid operator certification • If required to act as ORO, certification must be at the level of the facility or higher • If required to act as Operator-in-Charge (OIC), certification must be level 1 or higher • Training and/or experience in inspecting and monitoring drinking water system processes and performing/planning maintenance activities • Training on OCWA's QEMS and the DWQMS • Training on relevant legislation, regulations, codes, policies, guidelines and procedures • Experience using computers and operational computerized systems

3.2 The following table presents the minimum competencies required by staff that provide administrative support to operations personnel.

Role and/or Position	Required Minimum Competencies
Administrative Staff	• Experience and/or training related to procurement and business administration practices • Training on OCWA's QEMS and the DWQMS • Training on relevant legislation, regulations, codes, policies, guidelines and procedures • Experience using computers

3.3 OCWA's recruiting and hiring practices follow those of the Ontario Public Service (OPS). As part of the OPS, minimum competencies, which include education, skills, knowledge and experience requirements, are established when designing the job description for a particular position. As part of the recruitment process, competencies are then evaluated against the job description. Based on this evaluation, the hiring manager selects and assigns personnel for specific duties.

3.4 OCWA's Operational Training Program aims to:

- Develop the skills and increase the knowledge of staff and management;
- Provide staff with information and access to resources that can assist them in performing their duties; and
- Assist OCWA certified operators in meeting the legislative and regulatory requirements with respect to training.

3.5 The Program consists of Director Approved, continuing education and on-the-job training and is delivered using a combination of methods (e.g., traditional classroom courses, e-learning/webinars and custom/program-based courses/sessions). A formal evaluation process is in place for all sessions under the Operational Training Program and is a critical part of the Program's continual improvement.

3.6 Awareness of OCWA's QEMS is promoted during the orientation of new staff, at facility/cluster/regional hub level training sessions and meetings and through OCWA's Environmental Compliance 101 (EC 101) course. All new staff are required to complete the EC 101 course within their first year of joining OCWA. The purpose of the EC 101 course is to ensure staff are aware of applicable legislative and regulatory requirements, to promote awareness of OCWA's QEMS and to reinforce their roles and responsibilities under OCWA's QEMS.

3.7 Staff are also required to complete the training listed in OCWA's Mandatory Training Requirements procedure, based on their position and/or the duties they perform. This list includes mandatory environmental and health and safety compliance training, as well as the training deemed mandatory by OCWA corporate and Ontario Public Service (OPS) policies and is available on OCWA's intranet (sharepoint site).

3.8 Operations personnel also receive site-specific training/instruction on relevant operational and emergency response procedures to ensure effective operational control of processes and equipment which may impact the safety and quality of drinking water.

3.9 As part of OCWA's annual Performance Planning and Review (PPR) process, employee performance is evaluated against their job expectations. Professional development opportunities and training needs (which could include formalized courses as well as site-specific on-the-job training or job shadowing/mentoring) are identified as part of this process (and on an ongoing basis). In addition to this process, OCWA employees may at any time request training from either internal or external providers by obtaining approval from their Manager.

3.10 Certified drinking water operators are responsible for completing the required number of training hours in order to renew their certificates based on the highest class of drinking water subsystem they operate. They are also responsible for completing mandatory courses required by *Safe Drinking Water Act* (SDWA) O. Reg. 128/04 Certification of Drinking Water System Operators and Water Quality Analysts. The Operations Management takes reasonable steps to ensure that every operator has the opportunity to attend training to meet the requirements.

3.11 It is the responsibility of operations personnel to ensure Operations Management are aware of any change to the status/classification of their drinking water operator certificate(s), the validity of their driver's licence (required to hold at a minimum a Class G license which is initially verified upon hire) and/or the validity of any other required certificates/qualifications.

3.12 Individual OCWA employee training records are maintained and tracked using a computerized system, the Training Summary database, which is administrated by OCWA's Learning and Development Department. Training records maintained at the facility are controlled as per OP-05 Document and Records Control.

4. Related Documents

OCWA's Learning and Development Resources (OCWA Intranet/sharepoint)
[Orientation checklists/documentation]
OCWA's Mandatory Training Requirements (OCWA intranet/sharepoint)
Performance Planning and Review Database
OP-5 Document and Records Control
OCWA Training Summary Database

5. Revision History

COMPETENCIES

Reviewed by: QEMS Representative | Approved by: Operations Management

Date	Revision #	Reason for Revision
2024-11-18	0	Procedure issued
2025-06-04	1	Revise Operator titles, remove admin roles

PERSONNEL COVERAGE

Reviewed by: QEMS Representative	Approved by: Operations Management

1. Purpose

To describe the procedure for ensuring that sufficient and competent personnel are available for duties that directly affect drinking water quality at the Township of Huron-Kinloss Drinking Water Systems.

2. Definitions

Competency – an integrated set of requisite skills and knowledge that enables an individual to effectively perform the activities of a given occupation [*]

Essential Services – services that are necessary to enable the employer to prevent,

(a) danger to life, health or safety,
(b) the destruction or serious deterioration of machinery, equipment or premises,
(c) serious environmental damage, or
(d) disruption of the administration of the courts or of legislative drafting.

(*Crown Employees Collective Bargaining Act*, 1993)

3. Procedure

3.1 Operations Management ensures that personnel meeting the competencies identified in OP-10 Competencies are available for duties that directly affect drinking water quality.

3.2 The Township of Huron-Kinloss Drinking Water Systems is staffed by OCWA personnel as follows:

Operational coverage between 7:30 a.m. to 4:00 p.m. on Monday to Friday, with On Call coverage after hours, on weekends and statutory holidays.

3.3 Operations personnel are assigned to act as and fulfill the duties of Overall Responsible Operator (ORO) and Operator-in-Charge (OIC) in accordance with SDWA O. Reg. 128/04.

Operations Supervisor is the designated overall responsible operator (ORO). When the Operations Supervisor is unavailable, an alternative will be designated as the ORO and is recorded as such in the facility logbook.

The designated OIC for each shift is recorded in the facility logbook.

3.4 Operations Management assigns an on-call operator for the time that the facility is un-staffed (i.e., evenings, weekends and Statutory Holidays). The on-call shift change is end of business day on Monday. The on-call schedule is maintained by the Senior

[*] Based on the *2005 National Occupational Guidelines for Canadian Water and Wastewater Operators* and International Board of Standards for Training, Performance and Instruction

Operations Manager and consists of a 4-week rotation, is set on an annual basis and posted as identified in OP-05A.

3.5 The on-call operator conducts a physical inspection of the facility as needed on Statutory Holidays. Details of the inspection are recorded in the facility logbook and daily round sheets.

3.6 The SCADA system auto dialer is programmed to contact the on-call operator whenever there is an alarm condition. The on-call operator to obtain the details of the alarm to determine the appropriate response. If the nature of the alarm requires additional staff, the on-call operator can request assistance from any of the other certified operators. The on-call operator records details of the call-in in the facility logbook and in the Call-Back Report.

3.7 Operations Management is responsible for approving vacation time for their staff in a manner which ensures sufficient personnel are available for the performance of normal operating duties.

3.8 OCWA's operations personnel are represented by the Ontario Public Service Employees Union (OPSEU). In the event of a labour disruption, Operations Management, together with the union, identifies operations personnel to provide "essential services" required to operate the facility so that the quality of drinking water is not compromised in any way.

3.9 A contingency plan for Critical Shortage of Staff is included in the Facility Emergency Plan. This plan provides direction in the event that there is a severe shortage of operations personnel due to sickness (e.g., pandemic flu) or other unusual situations.

4. Related Documents

OP-10 Competencies
Facility Logbook
Daily Round Sheets
On-Call Schedule
Call-Back Reports
Shift/Vacation Schedule
Critical Shortage of Staff Contingency Plan (Facility Emergency Plan)
SOP - Overall Responsible Operator Designation
SOP - Operator-In-Charge Designation

5. Revision History

Date	Revision #	Reason for Revision
2024-11-18	0	Procedure issued
2025-05-09	1	Updated procedure 3.5 to remove physical inspection of facilities on weekends

PERSONNEL COVERAGE

Reviewed by: QEMS Representative	Approved by: Operations Management

1. Purpose

To describe the procedure for facility level internal and external QEMS-related communications between Top Management and:

- OCWA staff;
- the Owner;
- essential suppliers and service providers (as identified in OP-13); and
- the public.

2. Definitions

Operations Management – refers to the General Manager, Senior Operations Manager and/or Operations Manager that directly oversees a facility's operations

Operations Personnel – employees of the drinking water system who perform various activities related to the compliance, operations and maintenance of the drinking water system that may directly affect drinking water quality.

3. Procedure

3.1 Operations Management and the QEMS Representative are responsible for identifying and coordinating any site-specific communications in relation to the status/ development of the facility's QEMS.

3.2 Internal and external communication responsibilities and reporting requirements for emergency situations are set out under OCWA's Emergency Management Program (i.e., Facility Emergency Plan and OCWA's Corporate Emergency Response Plan). Refer to OP-18 Emergency Management for more information.

3.3 Communication with OCWA staff:

3.3.1 Within the first year of hire, all staff are required to complete the Environmental Compliance 101 (EC 101) course. The objective of the EC 101 course is to ensure that staff are aware of applicable legislative and regulatory requirements and of OCWA's QEMS and to reinforce their roles and responsibilities under OCWA's QEMS.

3.3.2 Operations Management are responsible for ensuring operations personnel receive site-specific training on the Operational Plan, the organizational structure for the facility including the roles and responsibilities and authorities (outlined in OP-09 Organizational Structure, Roles, Responsibilities and Authorities), QEMS Procedures and other related operating instructions and procedures as part of the orientation process and on an on-going basis as required.

3.3.3 The SPC Manager is responsible for ensuring training is provided for the Regional Hub (in consultation with Operations Management as required) on applicable legislative and regulatory requirements and the QEMS.

3.3.4 The QEMS Representative assists Operations Management and/or the SPC Manager in the coordination/delivery of training as required.

3.3.5 Revisions to the QEMS and associated documentation are communicated as per OP-05 Document and Records Control.

3.3.6 The QEMS Policy is available to all OCWA personnel through OCWA's intranet and as outlined in 3.6.2 of this procedure.

3.3.7 Operations personnel are responsible for identifying potential hazards at the facility that could affect the environmental and/or public health, and communicating these to Operations Management. They may also recommend changes be made to improve the facility's QEMS by making a request to the QEMS Representative (as per OP-05).

3.3.8 The QEMS Representative is responsible for ensuring that the Operations Management and the Safety, Process and Compliance Manager are informed regarding the compliance/quality status of the facility and QEMS implementation and any need for improved processes/procedures at the cluster/facility level.

3.3.9 The SPC Manager reports to the Regional Hub Manager on the compliance status, the QEMS performance and effectiveness, any need for improvement and on issues that may have Agency-wide significance. Operations Management reports to the Regional Hub Manager on facility operational performance.

3.4 Communication with the Owner:

3.4.1 The Operations Management ensures that the Owner is provided with QEMS updates and that they are kept informed of the status of the facility's operational and compliance performance during regularly scheduled meetings and/or through electronic and/or verbal communications. The QEMS Representative assists in the coordination of these meetings and with communicating the updates as directed.

3.4.2 The continuing suitability, adequacy and effectiveness of OCWA's QEMS are communicated to the Owner as part of the Management Review process (refer to OP-20 Management Review).

3.5 Communications with Essential Suppliers and Service Providers:

3.5.1 Communication requirements to ensure essential suppliers and service providers understand the relevant OCWA QEMS policies, procedures and expectations are described in OP-13 Essential Supplies and Services.

3.6 Communication with the Public:

3.6.1 Media enquiries must be directed to the facility's designated media spokesperson as identified in the Facility Emergency Plan. The media spokesperson coordinates with local and corporate personnel (as appropriate) and the Owner in responding to media inquiries.

3.6.2 OCWA's QEMS and QEMS Policy are communicated to the public through OCWA's public website (*www.ocwa.com*). The QEMS Policy is also posted at the Huron-Kinloss Cluster Office.

3.6.3 Facility tours for interested parties must be approved in advance by the Operations Management.

3.6.4 All complaints, whether received from the consumer, the community or other interested parties, are documented, tracked and stored on the SharePoint. As appropriate, the Operations Management ensures that the Owner is informed of the complaint and/or an action is developed to address the issue in a timely manner. The QEMS Representative ensures that consumer feedback is included for discussion at the Management Review.

4. Related Documents

OP-05 Document and Records Control
OP-09 Organizational Structure, Roles, Responsibilities and Authorities
OP-13 Essential Supplies and Services
OP-18 Emergency Management
OP-20 Management Review
Facility Emergency Plan
Corporate Emergency Response Plan

5. Revision History

Date	Revision #	Reason for Revision
2024-11-18	0	Procedure issued
2025-05-09	1	Updated section 3.6.4 to complaints being stored on the SharePoint and not OPEX system.

ESSENTIAL SUPPLIES AND SERVICES

Reviewed by: QEMS Representative	Approved by: Operations Management

1. Purpose

To describe OCWA's procedures for procurement and for ensuring the quality of essential supplies and services.

2. Definitions

Essential Supplies and Services – supplies and services deemed to be critical to the delivery of safe drinking water

3. Procedure

3.1 Essential supplies and services for the Township of Huron-Kinloss Drinking Water Systems are contained in the Facility Emergency Plan, Emergency Contact/Essential Supplies and Services List. The list is reviewed and updated at least once every calendar year by the QEMS Representative.

3.2 Purchasing is conducted in accordance with OCWA's Corporate Procurement and Administration policies, procedures and guidelines, which are adopted from those of the Ontario Public Service.

Purchases of capital equipment are subject to formal approval by the facility's owner.

3.3 As part of the corporate procurement process, potential suppliers/service providers are informed of relevant aspects of OCWA's QEMS through the tendering process and through specific terms and conditions set out in our agreements and purchase orders. Essential suppliers and service providers (including those contracted locally) are sent a letter that provides an overview of the relevant aspects of the QEMS.

3.4 Contractors are selected based on their qualifications and ability to meet the facility's needs without compromising operational performance and compliance with applicable legislation and regulations.

Contracted personnel including suppliers may be requested or required to participate in additional relevant training/orientation activities to ensure conformance with facility procedures and to become familiar with OCWA workplaces.

If necessary, appropriate control measures are implemented while contracted work is being carried out and communicated to all relevant parties to minimize the risk to the integrity of the drinking water system and the environment.

3.5 All third-party drinking water testing services are provided by accredited and licensed laboratories. The Ministry has agreement with The Canadian Association for Laboratory Accreditation (CALA) for accreditation of laboratories testing drinking water. The QEMS Representative is responsible for notifying the Ministry of any change to the drinking water testing services being utilized.

3.6 Internal verification and calibration activities (e.g. chlorine analyzer, turbidimeter, etc.) are conducted by operations personnel in accordance with equipment manuals and/or procedures (Refer to OP-17 Measurement Recording Equipment Calibration and Maintenance).

3.7 External calibration activities (e.g. flow meters) are conducted by qualified third-party providers. Qualifications of the service provider are verified during the procurement process. The service provider is responsible for providing a record/certificate of all calibrations conducted.

3.8 Chemicals purchased for use in the drinking water treatment process must meet AWWA Standards and be ANSI/NSF certified as per the Municipal Drinking Water Licence (MDWL).

3.9 The facility orders and receives ongoing deliveries of chemicals to satisfy current short-term needs based on processing volumes and storage capacities. Incoming chemical orders are verified by reviewing the manifest or invoice in order to confirm that the product received is the product ordered.

3.10 Process components/equipment provided by the supplier must meet applicable regulatory requirements and industry standards for use in drinking water systems prior to their installation.

4. Related Documents

Emergency Contact/Essential Supplies and Services List
OP-17 Measurement Recording Equipment Calibration and Maintenance
ANSI/NSF Documentation
AWWA Standards
MDWL
Calibration Certificates/Records

5. Revision History

Date	Revision #	Reason for Revision
2024-11-18	0	Procedure issued

REVIEW AND PROVISION OF INFRASTRUCTURE

Reviewed by: QEMS Representative	Approved by: Operations Management

1. Purpose

To describe OCWA's procedure for reviewing the adequacy of infrastructure necessary to operate and maintain the Huron-Kinloss Drinking Water Systems.

2. Definitions

Infrastructure – the set of interconnected structural elements that provide the framework for supporting the operation of the drinking water system, including buildings, workspace, process equipment, hardware, software and supporting services, such as transport or communication

3. Procedure

3.1 At least once every calendar year, Operations Management in conjunction with the Operations Supervisor conducts a review of the drinking water system's infrastructure to assess its adequacy for the operation and maintenance of the system. Operations personnel assist with identifying the need for infrastructure repairs, replacements or alterations and with prioritizing each identified item. Documents and records that are reviewed may include:

- Maintenance records
- Call-in reports
- Adverse Water Quality Incidents (AWQIs) or other incidents
- Health & Safety Inspections
- Ministry Inspection Reports
- Equipment Manuals

3.2 The outcomes of the risk assessment documented as per OP-08 are considered as part of this review.

3.3 The output of the review is a [6 year] rolling Capital and Major Maintenance Recommendations Report to assist the Owner and OCWA with planning infrastructure needs for the short and long-term. This report is submitted, at least once every calendar year by Operations Management, to the Owner for review and approval. Together with the Owner, Operations Management determines and documents timelines and responsibilities for implementation of priority items.

3.4 The final approved Capital and Major Maintenance Recommendations Report forms the long term forecast for any major infrastructure maintenance, rehabilitation and renewal activities as per OP-15.

3.5 Operations Management ensures that results of this review are considered during the Management Review process (OP-20).

4. Related Documents

Capital and Major Maintenance Recommendations Report & Acknowledgement/Approval from the owner
OP-08 Risk Assessment Outcomes
OP-15 Infrastructure Maintenance, Rehabilitation and Renewal
OP-20 Management Review
Management Review Minutes

5. Revision History

Date	Revision #	Reason for Revision
2024-11-18	0	Procedure issued
2025-05-09	1	Updated section 3.1 to Operations Supervisor instead of Team Lead

1. Purpose

To describe OCWA's infrastructure maintenance, rehabilitation and renewal program for the Huron-Kinloss Drinking Water Systems.

2. Definitions

Infrastructure – the set of interconnected structural elements that provide the framework for supporting the operation of the drinking water system, including buildings, workspace, process equipment, hardware, software and supporting services, such as transport or communication

Rehabilitation – the process of repairing or refurbishing an infrastructure element.

Renewal – the process of replacing the infrastructure elements with new elements.

3. Procedure

3.1 OCWA, under contract with the Owner, maintains a computerized Work Management System (WMS) to manage maintenance, rehabilitation and renewal of infrastructure for which it is operationally responsible. The major components of the WMS consist of planned maintenance, unplanned maintenance, rehabilitation, renewal and program monitoring and reporting.

3.1.1 Planned Maintenance

Routine planned maintenance activities include: pump inspection, analyzer calibrations, flow meter calibrations, valve inspection, hydrant flushing and inspections, reservoir inspections, tower inspections, facility inspections.

- *Inspect, adjust and calibrate process control equipment to ensure proper operation of water distribution systems, pumps, chemical feeders, and all other equipment installed at the facilities.*
- *Check of water booster and pumping stations to ensure everything is in order.*
- *Carry out a routine maintenance program including greasing and oiling as specified in the lubrication schedule.*
- *Perform day-to-day maintenance duties to equipment including checking machinery and electrical equipment when required.*
- *Maintain an inventory of all equipment and tools*
- *Maintain accurate records of work conducted, activities, and achievements.*

Planned maintenance activities are scheduled in the WMS that allows the user to:

- Enter detailed asset information;
- Generate and process work orders;

- Access maintenance and inspection procedures;
- Plan preventive maintenance and inspection work;
- Plan, schedule and document all asset related tasks and activities; and
- Access maintenance records and asset histories.

Planned maintenance activities are communicated to the person responsible for completing the task through the issuance of WMS work orders. Work orders are automatically generated on a daily, weekly, monthly, quarterly and annual schedule as determined based on manufacturer's recommendations and site specific operational and maintenance needs and are assigned directly to the appropriate operations personnel. This schedule is set up by the WMS Primary. Work orders are completed and electronically entered into WMS by the person responsible for completing the task. Records of these activities are maintained as per OP-05 Document and Records Control.

The Operations Management maintains the inventory of equipment in WMS and ensures that appropriate maintenance plans are in place. Maintenance plans are developed according to the manufacturer's instructions, regulatory requirements, industry standards, and/or client service requirements. Equipment Operation and Maintenance (O&M) manuals are accessible to operations personnel at the locations specified in OP-05 Document and Records Control.

3.1.2 Unplanned Maintenance

Unplanned maintenance is conducted as required. All unplanned maintenance activities are authorized by the Operations Management. Unplanned maintenance activities are recorded on corrective work orders and are entered into WMS by the person responsible for completing the unplanned maintenance activity.

3.1.3 Rehabilitation and Renewal

Rehabilitation and renewal activities including capital upgrades (major infrastructure maintenance) are determined at least once every calendar year in consultation with Operations Management and the Owner A list of required replacement or desired new equipment is compiled and prioritized by Operations Management in conjunction with operations personnel and is presented to the Owner for review and comment. All major expenditures require the approval of the Owner. In addition to the short-term facility needs (i.e. current year), the Capital and Major Maintenance Recommendations Report also provides a long-term rolling 6-year list of major maintenance recommendations. (Refer to OP-14 Review and Provision of Infrastructure).

3.1.4 Program Monitoring and Reporting

Maintenance needs for the facility are determined through review of manufacturer's instructions, regulatory requirements, industry standards, and/or client service requirements and are communicated by means of work orders. Additionally, Operations Management and the O&M Team Lead conduct a review of the drinking water system's infrastructure to assess its adequacy for the operation and maintenance of the system. (Refer to OP-14 Review and Provision of Infrastructure).

To assist in monitoring the effectiveness of the program quarterly operations reports are prepared and presented to the client; the quarterly operations reports identify maintenance activities both planned and unplanned. Additionally Operations Management and Owner Representatives schedule and meet on multiple occasions throughout the year to monitor and report on rehabilitation, renewal and maintenance activities and progress; the Operating Authority and Owner strive to meet quarterly.

3.2 OCWA's infrastructure maintenance, rehabilitation and renewal program is initially communicated to the Owner through the operating agreement. OCWA's program is communicated to the Owner on an on-going basis at a minimum of at least once every calendar year through submission of the Capital and Major Maintenance Recommendations Report and through the results of the Management Review.

4. Related Documents

Minutes of Management Review
Capital and Major Maintenance Recommendations Report & Acknowledgement/Approval from the Owner
OP-05 Document and Records Control
OP-14 Review and Provision of Infrastructure

5. Revision History

Date	Revision #	Reason for Revision
2024-11-18	0	Procedure issued

1. Purpose

To describe the procedure for sampling, testing and monitoring for process control and finished drinking water quality.

2. Definitions

Challenging Conditions – any existing characteristic of the water source or event-driven fluctuations that impact the operational process as identified and listed under OP-06 Drinking Water System

3. Procedure

3.1 All sampling, monitoring and testing is conducted at a minimum in accordance with SDWA O. Reg. 170/03 and the facility's Municipal Drinking Water License (MDWL).

3.2 Sampling requirements for the facility are defined in the facility's sampling schedule/plan/calendar which is available to operations personnel, at the location(s) noted in OP-05 Document and Records Control. The sampling schedule is maintained by the QEMS Representative and is updated as required.

3.3 Samples that are required to be tested by an accredited and licensed laboratory, are collected, handled and submitted according to the directions provided by the licensed laboratory(ies) that conducts the analysis. The laboratory(ies) used for this facility are listed in the Essential Supplies and Services List (within the Facility Emergency Plan (FEP)).

Electronic and/or hardcopy reports received from the laboratory are maintained as per OP-05 Document and Records Control. Analytical results from laboratory reports are uploaded into OCWA's Process Data Management system (PDM).

3.4 Continuous monitoring equipment is used to sample and test for treated water free chlorine residual. Test results from continuous monitoring equipment are captured by the SCADA system and are reviewed by a certified operator in accordance with the requirements of SDWA O. Reg. 170/03.

The SCADA system also collects and records information on the following parameters related to process control and finished drinking water quality:

- Raw and treated water flow rates;
- System pressures

3.5 Adverse water quality incidents are responded to and reported as per SOP for Reporting Adverse Water Quality (Under SDWA O. Reg. 170/03) located within the FEP.

3.6 In-house process control activities are conducted on a regular basis by the certified operator(s) on duty and at a minimum are conducted as follows:

Operational Parameter – Whitechurch (Small DWS)	**Location**	**Minimum Frequency**
Raw Turbidity	Raw water	Grab monthly
Well Level	Raw Water Well	Monthly
Treated Turbidity	Treated water	Grab monthly
Free Chlorine	Treated water	Grab when onsite
Free Chlorine	Distribution water	1 Grab two times a week

Operational Parameter – Ripley and Lakeshore DWS	**Location**	**Minimum Frequency**
Raw Turbidity	Raw water	Grab monthly
Well Level	Raw Water Well	Monthly
Treated Turbidity	Treated water	Grab monthly
Free Chlorine	Treated water	Grab when onsite
Free Chlorine	Distribution water	Grab 4 and 3
Operational Parameter – Lucknow DWS	**Location**	**Minimum Frequency**
Raw Turbidity	Raw water	Grab monthly
Well Level	Raw Water Well	Weekly
Treated Turbidity	Treated water	Grab monthly
Free Chlorine	Treated water	Grab when onsite
Free Chlorine	Distribution water	Grab 4 and 3

In-house samples are analyzed following approved laboratory procedures. The sampling results are recorded on the check sheet/round sheet. The results are entered into PDM. Any required operational process adjustments are recorded in the facility log book.

3.7 The Township of Huron-Kinloss Drinking Water Systems well water is analyzed quarterly for arsenic, fluoride, sodium and barium due to elevated levels; no additional sampling, testing and monitoring activities related to a facility's/system's most challenging conditions have been identified.

3.8 There are no relevant upstream sampling, testing and monitoring activities that take place for this facility/system.

3.9 Sampling, testing and monitoring results are readily accessible to the Owner electronically; the owner receives copies of lab reports directly from the lab.

The owner is provided with a quarterly Operations Report which shows an overview of the sampling results.

At a minimum, Owners are provided with an annual summary of sampling, testing and monitoring results through the SDWA O. Reg. 170/03 Section 11 Annual Report, the Schedule 22 Municipal Summary Report and through the Management Review process outlined in OP-20 Management Review.

In addition, updates regarding sampling, testing and monitoring activities are provided as per the operating agreement and during regular client meetings.

4. Related Documents

Facility Logbook
OP-05 Document and Records Control
OP-06 Drinking Water System
OP-20 Management Review
Laboratory Analysis Reports
Laboratory Chain of Custody Forms
Annual Report (O. Reg. 170 Section 11)
Municipal Summary Report (O. Reg. 170 Schedule 22)
Process Data Management System (PDM) records
Emergency Contact List and Essential Supplies & Services List (Contacts section of FEP)
Operational Check Sheets/Data Collection Sheet
Sampling Plan/Calendar/Schedule
SCADA Records
WMS Records
Operations Report

5. Revision History

Date	Revision #	Reason for Revision
2024-11-18	0	Procedure issued
2025-05-20	1	Updated s.3.6 to include requirements for Whitechurch small DWS and Lucknow weekly well depths Identified Operations Report in s3.9

MEASUREMENT AND RECORDING EQUIPMENT CALIBRATION AND MAINTENANCE

Reviewed by: QEMS Representative	Approved by: Operations Management

1. Purpose

To describe the procedure for the calibration and/or verification and maintenance of measurement and recording equipment at the Township of Huron-Kinloss Water Supply Systems.

2. Definitions

None

3. Procedure

3.1 All measurement and recording equipment calibration and maintenance activities must be performed by appropriately trained and qualified personnel or by a qualified third-party calibration service provider (refer to OP-13 Essential Supplies and Services).

3.2 The WMS Primary establishes and maintains a list of measurement and recording devices and associated calibration and/or verification schedules using the automated Work Management System (WMS). When a new device is installed, it is added to the WMS system by the WMS Primary. The new device is tagged with a unique identification number and the maintenance schedule is set up. Work orders are then automatically generated as per the schedule (refer to OP-15 Infrastructure Maintenance, Rehabilitation and Renewal).

Facility	Equipment Description	WMS ID#	Frequency
Whitechurch DWS	Chlorine Analyzer	0000404023	Annually (Third Party)
Whitechurch DWS	Pre-Chlorine Analyzer	0000404021	Annually (Third Party)
Whitechurch DWS	Flow Meter -1	0000404006	Annually (Third Party)
Whitechurch DWS	Flow Meter -2	0000404007	Annually (Third Party)
Lucknow DWS	Lucknow Well 4 Flow Meter	0000404940	Annually (Third Party)
Lucknow DWS	Lucknow Well 4 Chlorine Analzyer	0000404935	Annually (Third Party)
Lucknow DWS	Lucknow Well 5 Flow Meter	0000404959	Annually (Third Party)
Lucknow DWS	Lucknow Well 5 Chlorine Analzyer	0000404965	Annually (Third Party)
Lucknow DWS	Lucknow Well 5 Pre-Chlorine Analyzer	0000404973	Annually (Third Party)
Ripley DWS	Ripley Wellhouse Flow Totalizer	0000404043	Annually (Third Party)
Ripley DWS	Ripley Wellhouse Chlorine Analyzer	0000404058	Annually (Third Party)
Ripley DWS	Ripley Elevated Tank Flow Meter 111	0000404084	Annually (Third Party)
Ripley DWS	Ripley Elevated Tank Flow Meter 121	0000404085	Annually (Third Party)
Ripley DWS	Ripley Elevated Tank Chlorine Analyzer	0000404105	Annually (Third Party)
Ripley DWS	Ripley Elevated Tank Pre-Chlorine Analyzer	0000404104	Annually (Third Party)

Lakeshore DWS	Point Clark Flow Totalizer	0000405364	Annually (Third Party)
Lakeshore DWS	Point Clark Chlorine Analyzer	0000405345	Annually (Third Party)
Lakeshore DWS	Blairs Grove Raw Flow Totalizer	0000404159	Annually (Third Party)
Lakeshore DWS	Blairs Grove Chlorine Analyzer	0000404162	Annually (Third Party)
Lakeshore DWS	Murdoch Glen Raw Flow Totalizer	0000404242	Annually (Third Party)
Lakeshore DWS	Murdoch Glen Zone 2 Flow Totalizer	0000404224	Annually (Third Party)
Lakeshore DWS	Murdoch Glen Zone 3 Flow Totalizer	0000404231	Annually (Third Party)
Lakeshore DWS	Murdoch Glen Chlorine Analyzer	0000404245	Annually (Third Party)
Lakeshore DWS	Huronville South Flow Totalizer	0000404043	Annually (Third Party)
Lakeshore DWS	Huronville South Chlorine Analzyer	0000404058	Annually (Third Party)
Township of Huron-Kinloss DWS	Portable Analyzer	0000404925	Monthly (Operators) Annually (Third Party)
Township of Huron-Kinloss DWS	Portable Chlorine Analyzer	0000404926	Monthly (Operators) Annually (Third Party)
Township of Huron-Kinloss DWS	Portable Chlorine Analyzer	0000405308	Monthly (Operators) Annually (Third Party)
Township of Huron-Kinloss DWS	Portable Chlorine Analyzer	0000405309	Monthly (Operators) Annually (Third Party)
Township of Huron-Kinloss DWS	Portable Chlorine Analyzer	0000405310	Monthly (Operators) Annually (Third Party)
Township of Huron-Kinloss DWS	Portable Turbidity Meter	0000404927	Monthly (Operators) Annually (Third Party)
Township of Huron-Kinloss DWS	Portable Turbidity Meter	0000404928	Monthly (Operators) Annually (Third Party)

3.3 Details regarding the results of the calibration and/or verification are recorded within each individual work order generated by the WMS.

3.4 Calibration and maintenance activities are carried out in accordance with procedures specified in the manufacturer's manual and instructions specified in WMS.

3.5 Standards, reagents and/or chemicals that may be utilized during calibration and/or verification and/or maintenance activities are verified before use to ensure they are not expired. Any expired standards, reagents and/or chemicals are appropriately disposed of and are replaced with new standards, reagents and/or chemicals as applicable.

3.6 Any measurement device which does not meet its specified performance requirements during calibration and/or verification must be removed from service (if practical) until repaired, replaced or successfully calibrated. The failure must be reported to the Operations Management, ORO, OIC on duty as soon as possible so that immediate measures can be taken to ensure that drinking water quality has not been compromised by the malfunctioning device. Any actions taken as a result of the failure are recorded in the facility logbook and on a corrective workorder as necessary. The PCT ensures that any notifications required by applicable legislation are completed and documented within the specified time period.

3.7 Calibration and maintenance records and maintenance/equipment manuals are maintained as per OP-05 Document and Records Control.

4. Related Documents

Facility Logbook
WMS Records
Calibration/Maintenance Records
Maintenance/Equipment Manuals
OP-05 Document and Records Control
OP-13 Essential Supplies and Services
OP-15 Infrastructure Maintenance, Rehabilitation and Renewal

5. Revision History

Date	Revision #	Reason for Revision
2024-11-18	0	Procedure issued
2025-06-04	1	Added list of equipment and calibration/verification frequencies to s.3.2
2025-07-25	2	Updated equipment list to add handheld chlorine analyzer 0000405310

1. Purpose

To describe the procedure for maintaining a state of emergency preparedness at the facility level under OCWA's Emergency Management Program.

2. Definitions

Corporate Emergency Response Plan (CERP) – a corporate-level emergency preparedness plan for responding to and supporting serious (Level 3) operations emergencies

Facility Emergency Plan (FEP) – a facility-level emergency preparedness plan for responding to and recovering from operations emergencies

Operations Management – refers to the General Manager, Senior Operations Manager and/or Operations Manager that directly oversees a facility's operations

3. Procedure

3.1 The Facility Emergency Plan (FEP) is the corporate standard for emergency management at OCWA-operated facilities. The FEP supports the facility-level response to and recovery from Level 1, 2 and 3 events related to water and wastewater operations and directly links to the Corporate Emergency Response Plan (CERP) for management of Level 3 events that require corporate support. Operations Management is responsible for establishing a site-specific FEP that meets the corporate standard for this drinking water system.

3.2 OCWA recognizes three levels of events:

Level 1 is an event that can be handled entirely by plant staff and regular contractors. The event and the actions taken to resolve it (and to prevent a reoccurrence, if possible) are then included in regular reporting (both internally and externally). Examples may include response to an operational alarm, first aid incident, small on-site spill, or a process upset that can be easily brought under control.

Level 2 is an event that is more serious and requires immediate notification of others (regulator, owner). Examples may include minor basement flooding, injury to staff that requires medical attention, or a spill that causes or is likely to cause localized, off-site adverse effects. If the event reaches this level, the instructions indicate the need to contact the Safety, Process and Compliance Manager/Regional Hub Manager.

Level 3 is an actual or potential situation that will likely require significant additional resources and/or threatens continued operations. It may require corporate-level support including activation of the OCWA Action Group and opening of an Emergency Operations Centre (EOC) as described in the CERP. Level 3 events usually involve

intervention from outside organizations (client, emergency responders, Ministry, media, etc.). Examples may include:

- Disruption of service/inability to meet demand;
- Critical injury including loss of life;
- Breach of security that is a threat to public health;
- Intense media attention;
- Community emergency affecting water supply/treatment;
- Declared pandemic; or
- Catastrophic failure that could impact public health or the environment or cause significant property damage.

3.3 Potential emergency situations or service interruptions identified for the Township of Huron-Kinloss Water Supply Systems include:

- Unsafe Water
- Spill Response
- Critical Injury
- Critical Shortage of Staff
- Loss of Service
- Security Breach

3.4 The processes for responding to and recovering from each potential emergency /service disruption are documented within a site-specific contingency plan (CP). The CPs and related standard operating procedures (SOPs) are contained within the FEP.

3.5 OCWA's training requirements related to the FEP are as follows:

Training Topic	Training Provider	Type of Training	Frequency	Required For
Establishing and maintaining a FEP that meets the corporate standard	Safety, Process and Compliance Manager and/or Corporate Compliance (as required)	On-the-Job Practical	Upon hire and when changes are made to the corporate standard*	PCTs (or others identified by the Operations Management)
Contents of the site-specific FEP	Facility Level (coordinated by QEMS Representative)	On-the-Job Practical	Upon hire and when changes to the FEP are made*	All operations personnel with responsibilities for responding to an emergency

*Note: Changes to the corporate standard or site-specific FEP may only require the change to be communicated to Operations for implementation. Therefore, not all changes will require training.

3.6 At least one CP must be tested each calendar year and each CP must be reviewed at least once in a five-calendar year period. The reviews and tests are recorded on the FEP-01 Contingency Plan Review/Test Summary Form and in WMS as appropriate. This record includes the outcomes of the review/test, and identifies any opportunities for improvement and actions taken. A scheduled test of a CP may be regarded as a review of that particular CP as long as the outcomes are evaluated using the FEP-01

form. A CP-related response to an actual event may also be considered a review or a test. A review of the incident including lessons learned should be recorded on FEP-01 following the resolution of the actual event, along with any opportunities for improvement/actions identified.

3.7 Revisions to the CPs, SOPs and other FEP documents are made (as necessary) following a review, test, actual event or other significant change (e.g., changes in regulatory requirements, corporate policy or operational processes and/or equipment, etc.). Results of the emergency response testing and any opportunities for improvement/actions identified are considered during the Management Review (OP-20).

3.8 Roles and responsibilities for emergency management at OCWA-operated facilities are set out in the FEP. Specific roles and responsibilities related to a particular emergency or service interruption (including those of the Owner where applicable) are set out in the relevant site-specific CP. A general description of the respective responsibilities of the Owner and the operating authority in the event an emergency occurs is included in the service agreement with the Owner (as required by the *Safe Drinking Water Act*).

3.9 Where they exist, any relevant sections of the Municipal Emergency Response Plan (MERP) are included or referenced in the appendices section of the FEP. Measures specified in the MERP are incorporated into CPs where appropriate.

3.10 An emergency contact list in conjunction with the essential supplies and services list is contained within the FEP and is reviewed/updated at least once per calendar year. An emergency communications protocol is contained within the FEP. Specific notification requirements during emergency situations or service interruptions are set out in the individual CPs and in the CERP.

4. Related Documents

Facility Emergency Plan
Corporate Emergency Response Plan
FEP-01 Contingency Plan Review/Test Summary Form
WMS
Municipal Emergency Response Plan (as applicable)
Emergency Contact List/Essential Supplies & Services List (Contacts section of FEP)
OP-20 Management Review

5. Revision History

Date	Revision #	Reason for Revision
2024-11-18	0	Procedure issued

1. Purpose

To describe the procedure for conducting internal audits at the facility level that evaluate the conformance of OCWA's Quality & Environmental Management System (QEMS) to the requirements of the Drinking Water Quality Management Standard (DWQMS).

This procedure applies to Internal QEMS Audits conducted at the Huron-Kinloss Drinking Water Systems for the purpose of meeting the DWQMS requirements for internal audits.

Note**:** This procedure does not apply to internal compliance audits conducted in accordance with OCWA's Internal Audit Program.

2. Definitions

Audit Team – one or more Internal Auditors conducting an audit

Internal Auditor – an individual selected to conduct an Internal QEMS Audit

Internal QEMS Audit – a systematic and documented internal verification process that involves objectively obtaining and evaluating documents and processes to determine whether a quality management system conforms to the requirements of the DWQMS

Lead Auditor – Internal Auditor responsible for leading an Audit Team

Non-conformance – non-fulfillment of a DWQMS requirement

Objective Evidence – verifiable information, records or statements of facts. Audit evidence is typically based on interviews, examination of documents, observations of activities and conditions, reviewing results of measurements and tests or other means. Information gathered through interviews should be verified by acquiring supporting information from independent sources

Opportunity for Improvement (OFI) – an observation about the QEMS that may, in the opinion of the Internal Auditor, offer an opportunity to improve the effectiveness of the system or prevent future problems; implementation of an OFI is optional

3. Procedure

3.1 Audit Objectives, Scope and Criteria

3.1.1 In general, the objectives of an internal QEMS audit are:

- To evaluate conformance of the implemented QEMS to the requirements of the DWQMS;
- To identify non-conformances with the documented QEMS; and
- To assess the effectiveness of the QEMS and assist in its continual improvement.

3.1.2 The scope of an internal QEMS audit includes activities and processes related to the QEMS as documented in the Operational Plan.

3.1.3 The criteria covered by an internal QEMS audit include:
- Drinking Water Quality Management Standard (DWQMS)
- Current Operational Plan
- QEMS-related documents and records

3.1.4 The audit scope and criteria may be customized as necessary to focus on a particular process/critical control point and/or any elements of the DWQMS which may warrant specific attention. The results of previous internal and external audits should also be considered.

3.2 Audit Frequency

3.2.1 Internal QEMS audits may be scheduled and conducted once every calendar year or may be separated into smaller audit sessions scheduled at various intervals throughout the calendar year. However, all elements of the DWQMS must be audited at least once every calendar year.

3.2.2 The QEMS Representative is responsible for maintaining the internal QEMS audit schedule. The audit schedule may be modified based on previous audit results.

3.3 Internal Auditor Qualifications

3.3.1 Internal QEMS audits shall only be conducted by persons approved by the QEMS Representative and having the following minimum qualifications:
- Internal auditor training or experience in conducting management system audits; and
- Familiarity with the DWQMS requirements.

3.3.2 Internal Auditors that do not meet the qualifications in s.3.3.1 may form part of the Audit Team for training purposes, but cannot act as Lead Auditor.

3.3.3 Internal Auditors must remain objective and, where practical, be independent of the areas/activities being audited. It may not be possible for internal auditors to be fully independent of the activity being audited, but every effort should be made to remove bias and encourage objectivity. Auditors should maintain objectivity throughout the audit process to ensure that the audit findings and conclusions are based only on the audit evidence. Objectivity can be demonstrated by obtaining sufficient appropriate evidence to provide a reasonable basis for the

audit findings.

3.4 Audit Preparation

3.4.1 Together, the QEMS Representative and the Lead Auditor:

- Establish the audit objectives, scope and criteria;
- Confirm the audit logistics (locations, dates, expected time and duration of audit activities, any health and safety considerations, availability of key personnel, audit team assignments, etc.).

3.4.2 Each Internal Auditor is responsible for:

- Reviewing documentation to prepare for their audit assignments including:
  - the Operational Plan and related procedures;
  - results of previous internal and external QEMS audits;
  - the status and effectiveness of corrective and preventive actions implemented;
  - the results of the management review;
  - the status/consideration of OFIs identified in previous audits; and
  - other relevant documentation.
- Preparing work documents (e.g., checklists, forms, etc.) for reference purposes and for recording objective evidence collected during the audit

3.5 Conducting the Audit

3.5.1 Opening and closing meetings are not required, but may be conducted at the discretion of the QEMS Representative and the Lead Auditor taking into account expectations of Top Management.

3.5.2 The Audit Team gathers and records objective evidence by engaging in activities that may include conducting interviews with Operations Management and staff (in person, over the phone and/or through e-mail), observing operational activities and reviewing documents and records.

3.5.3 The Audit Team generates the audit findings by evaluating the objective evidence against the audit criteria (s. 3.1.3). In addition to indicating conformance or non-conformance, the audit findings may also lead to the identification of opportunities for improvement (OFIs). The Lead Auditor is responsible for resolving any differences of opinion among Audit Team members with respect to the audit findings and conclusions.

3.6 Reporting the Results

3.6.1 The Lead Auditor reviews the audit findings and conclusions with the QEMS Representative and Top Management. Other audit participants may also take part in this review as appropriate. This review may take place in person (e.g.,

during a closing meeting) or through other means (phone call, email, etc.). Any diverging opinions regarding the audit findings and conclusions should be discussed and, if possible, resolved. If not resolved, this should be noted by the Lead Auditor.

3.6.2 The Lead Auditor submits a written report and/or completed work documents to the QEMS Representative. The submitted documentation must identify (at a minimum):

- Audit objectives, scope and criteria;
- Audit Team member(s) and audit participants;
- Date(s) and location(s) where audit activities where conducted;
- Audit findings including:
  - Related objective evidence for each element;
  - Any non-conformance identified referencing the requirement that was not met; and
  - OFIs or other observations.
- Audit conclusions.

3.6.3 The QEMS Representative distributes the audit results to Top Management and others as appropriate.

3.6.4 The QEMS Representative ensures that results of internal QEMS audits are included as inputs to the Management Review as per OP-20 Management Review.

3.7 Corrective Actions and Opportunities for Improvement (OFIs)

3.7.1 Corrective actions are initiated when non-conformances are identified through internal QEMS audits and are documented and monitored as per OP-21 Continual Improvement.

3.7.2 OFIs are considered, and preventive actions initiated, documented and monitored as per OP-21 Continual Improvement.

3.8 Record-Keeping

3.8.1 Internal QEMS audit records are filed by the QEMS Representative and retained as per OP-05 Document and Records Control.

4. Related Documents

Internal Audit Records (checklists, forms, reports, etc.)
OP-05 Document and Records Control
OP-20 Management Review
OP-21 Continual Improvement

Township of Huron-Kinloss Water Supply Systems Summary Table of Action Items

5. Revision History

Date	Revision #	Reason for Revision
2024-11-18	0	Procedure issued

1. Purpose

To describe the procedure for conducting a Management Review of the Quality & Environmental Management System (QEMS) at the facility level.

2. Definitions

Management Review – a formal (documented) meeting conducted at least once every calendar year by Top Management to evaluate the continuing suitability, adequacy and effectiveness of OCWA's Quality & Environmental Management System (QEMS)

Operations Management – refers to the General Manager, Senior Operations Manager and/or Operations Manager that directly oversees a facility's operations

Top Management – a person, persons or group of people at the highest management level within an operating authority that makes decisions respecting the QMS and recommendations to the owner respecting the subject system or subject systems. OCWA has defined Top Management for the Huron-Kinloss Drinking Water Systems as:

- Operations Management – Bluewater/Lucan Cluster
- Regional Hub Manager – Midwest Region
- Safety, Process & Compliance (SPC) Manager – Midwest Region

3. Procedure

3.1 Top Management ensures that a Management Review is conducted at least once every calendar year.

Management Reviews for more than one drinking water system may be conducted at the same meeting provided the systems belong to the same owner and the considerations listed in section 3.4 below are taken into account for each individual system and documented in the Management Review meeting minutes.

3.2 At a minimum, the QEMS Representative, at least one member of Top Management and at least one facility operator must attend the Management Review meeting. Other members of Top Management may participate though their attendance is optional.

3.3 Other staff may be invited to attend the Management Review meeting or to assist with presenting information or in reviewing the information presented, where they offer additional expertise regarding the subject matter.

3.4 The standing agenda for Management Review meetings is as follows:

a) Incidents of regulatory non-compliance;
b) Incidents of adverse drinking water tests;
c) Deviations from critical control limits and response actions;
d) The effectiveness of the risk assessment process;

e) Internal and third-party audit results (including any preventive actions implemented to address Opportunities for Improvement (OFI) or rationale as to why OFIs were not implemented);
f) Results of emergency response testing (including any OFIs identified);
g) Operational performance;
h) Raw water supply and drinking water quality trends;
i) Follow-up on action items from previous Management Reviews;
j) The status of management action items identified between reviews;
k) Changes that could affect the QEMS;
l) Consumer feedback;
m) The resources needed to maintain the QEMS;
n) The results of the infrastructure review;
o) Operational Plan currency, content and updates;
p) Staff suggestions; and
q) Consideration of applicable Best Management Practices (BMPs).

3.5 In relation to standing agenda item q), applicable BMPs, if any, to address drinking water system risks discussed during other agenda items, are identified and documented in the Management Review minutes. Review and possible adoption of applicable BMPs are revisited during subsequent Management Reviews and are incorporated into preventive and/or corrective actions as per OP-21 as appropriate.

3.6 The QEMS Representative coordinates the Management Review and distributes the agenda with identified responsibilities to participants in advance of the Management Review meeting along with any related reference materials.

3.7 The Management Review participants review the data presented and make recommendations and/or initiate action to address identified deficiencies as appropriate as per OP-21.

3.8 The QEMS Representative ensures that minutes of and actions resulting from the Management Review meeting are prepared and distributed to the appropriate OCWA Top Management, personnel and the Township of Huron-Kinloss Owner Representative.

3.9 The QEMS Representative monitors the progress and documents the completion of actions resulting from the Management Review.

4. Related Documents

Management Review Reference Materials
Minutes and actions resulting from the Management Review
OP-21 Continual Improvement

5. Revision History

Date	Revision #	Reason for Revision
2024-11-18	0	Procedure issued

1. Purpose

To describe the procedure for tracking and measuring continual improvement of the Quality & Environmental Management System (QEMS) for the Huron-Kinloss Drinking Water Systems.

2. Definitions

Continual Improvement - recurring activity to enhance performance *(ISO 14001:2014)*

Corrective Action – action to eliminate the cause of detected nonconformity of the QMS with the requirements of the DWQMS or other undesirable situation

Non-conformance – the non-fulfilment of a DWQMS requirement

Preventive Action – action to prevent the occurrence of nonconformity of the QMS with the requirements of the DWQMS or other undesirable situation

3. Procedure

3.1 OCWA strives to continually improve the effectiveness of its QEMS for this drinking water system(s) through the identification and implementation of corrective/preventive actions and, as appropriate, through review and consideration of applicable Best Management Practices (BMPs).

3.2 Corrective Actions

3.2.1 Non-conformances may be identified through an internal or external QEMS audit(s) conducted for this drinking water system. They may also be identified as a result of other events such as:

- an incident/emergency;
- community/Owner complaint;
- other reviews; and
- operational checks, inspections or audits.

3.2.2 The QEMS Representative (in consultation with Operations Management and/or the SPC Manager) investigates the need for a corrective action to eliminate the root cause(s) so as to prevent the non-conformance from recurring. The investigation may also include input from the operators and other stakeholders and the consideration of BMPs as appropriate.

3.2.3 The QEMS Representative determines the corrective action needed based on this consultation. The Operations Management (or designate) assigns

responsibility and a target date for resolution.

3.2.4 The QEMS Representative ensures corrective actions are documented using the Summary Table of Actions Items tracking spreadsheet and Action and Analysis Plan where applicable. The QEMS Representative monitors the progress of corrective action(s) and provides status updates to Top Management.

3.2.5 The implementation and effectiveness of corrective actions are verified during subsequent internal QEMS audits and are considered during the Management Review. If there is evidence that the action taken was not effective, the Operations Management (or designate) initiates further corrective action and assigns resources as appropriate until the non-conformance is fully resolved.

3.3 Preventive Actions

3.3.1 Potential preventive actions may be identified through an internal or external QEMS audit as Opportunities For Improvement (OFIs), during the Management Review or through other means such as:

- staff/Owner suggestions;
- regulator observations;
- evaluation of incidents/emergency response/tests;
- the analysis of facility/Regional Hub or OCWA-wide data/trends;
- non-conformances identified at other drinking water systems; or
- a result of considering a BMP.

3.3.2 The QEMS Representative (in consultation with Operations Management and/or the SPC Manager) considers whether a preventive action is necessary. The review may also include input from the operators and other stakeholders and the consideration of BMPs as appropriate.

3.3.3 If it is decided that a preventive action is necessary, the QEMS Representative determines the action to be taken based on this consultation and the Operations Management (or designate) assigns responsibility and a target date for implementation.

3.3.4 The implementation of preventive actions are tracked by the QEMS Representative using the Summary Table of Action Items tracking spreadsheet.

3.3.5 The implementation and effectiveness of preventive actions are verified during subsequent internal QEMS audits and are considered during the Management Review. If there is evidence that the action taken was not effective, the Operations Management (or designate) may consider further preventive actions and assigns resources as appropriate.

3.4 The QEMS Rep. and Operations Management monitor corrective/preventive actions on an ongoing basis and review the status and effectiveness of the actions during subsequent Management Review meetings.

3.5 Best Management Practices (BMPs)

3.5.1 The QEMS Representative and/or Operations Management in consultation with the SPC Manager will review and consider applicable internal and/or external BMPs identified by internal and/or external sources as part of the Management Review (OP-20) and in the corrective and preventive action processes described above.

3.5.2 BMPs may include, but are not limited to:

- Facility/Regional Hub practices developed and adopted as a result of changes to legislative or regulatory requirements, trends from audit findings or drinking water system performance trends;
- OCWA-wide BMPs/guidance or recommended actions;
- Drinking water industry based standards/BMPs or recommendations; or
- Those published by the Ministry of the Environment and Climate Change.

3.5.3 At a minimum, applicable BMPs must be reviewed and considered once every 36 months.

4. Related Documents

OP-05 Document and Records Control
OP-20 Management Review
Internal Audit Records
Summary Table of Action Items spreadsheet
Action and Analysis Plan: for Ministry Inspection findings only
MECP/MOL/MOH/EC Inspection Reports

5. Revision History

Date	Revision #	Reason for Revision
2024-11-18	0	Procedure issued