ONTARIO CLEAN WATER AGENCY
AGENCE ONTARIENNE DES EAUX

OPERATIONAL PLAN

Erin Drinking Water System

Hillsburgh Drinking Water System

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.

Any documents developed and owned by OCWA which are referred to in this Operational Plan (including, but not limited to, OCWA's QEMS documents, Standard Operating Procedures, policies and Facility Emergency Plans) remain the property of OCWA. Accordingly, these documents shall not be considered to form part of the Operational Plan belonging to the owner of a drinking-water system under Section 17 of the *Safe Drinking Water Act, 2002*.

QEMS

TABLE OF CONTENTS

Reviewed by: PCT	Approved by: Senior Operations Manager

1. Purpose

To document OCWA's Quality & Environmental Management System (QEMS). This Operational Plan defines and documents the QEMS for the Town of Erin DWS 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 the Province of Ontario's Drinking Water Quality Management Standard (DWQMS).

2. Definitions

Drinking Water Quality Management Standard (DWQMS) – means the quality management standard approved by the Minister in accordance with section 21 of the 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.

3. Procedure

3.1 The Town of Erin Drinking Water System is owned by the Corporation of The Town of Erin. OCWA is the contracted Operating Authority for the Town of Erin DWS which includes the following facilities:
- Erin DWS;
- Hillsburgh DWS

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 systems listed above fulfils the requirements of the MECP's DWQMS. The 21 QEMS Procedures within this Operational Plan align with the 21 elements of the DWQMS.

4. Related Documents

MECP's Drinking Water Quality Management Standard
All QEMS Procedures and Documents referenced in this Operational Plan

5. Revision History

Date	Revision #	Reason for Revision
2018-09-21	0	Procedure issued – Information within OP-01 was originally set out in the Main body of OCWA's Operational Plan (last revision 7 dated 2017-09-17). New purpose, Definitions, Procedure, Related Documents and separate Revision History sections. Addition of new wording (section 3.3) to clarify that the OCWA's Operational Plan now aligns with the 21 elements of DWQMS.

QUALITY & ENVIRONMENTAL MANAGEMENT SYSTEM (QEMS) POLICY

Reviewed by: PCT	Approved by: Senior Operations Manager

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, reliable and cost-effective clean water services that protect public health and the environment.
- 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 6, 2016
(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, the Owner and the public through OCWA's intranet and public websites. 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 maintained on OCWA's intranet.

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
2018-09-21	0	Procedure issued – Section 3.4, 3.5 and 3.6 were added to the information originally set out in the main body of OCWA's Operational Plan (last revision 7 dated 2017-09-25). New sections: Purpose, Definitions, Procedure, Related Documents and a separate Revision History. Minor revisions to wording in section 3.3 to reference location of posted copy of the policy. Added sections on how annual policy review is conducted (section 3.5 and section 3.6) and reference to OP-13 ESS (section 3.4). The full revision history for the QEMS policy is available on OCWA's intranet.

COMMITMENT AND ENDORSEMENT

Reviewed by: PCT	Approved by: Senior Operations Manager

1. Purpose

To document the endorsement of the Operational Plan for the Town of Erin DWS by OCWA Top Management and the Town of Erin (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 the Senior Operations Manager and Safety, Process and Compliance Manager or Regional Hub 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
2018-09-21	0	Procedure issued – Information within OP-03 was originally set out in the main body of OCWA's Operational Plan (last revision 7 dated 2017-09-25). Procedure provides information on who from Top Management endorses the Operations Plan (section 3.1); when owner re-endorsement is sought and 'criteria' as to what is considered a major revision to the plan (section 3.2). The Owner and Top Management sign-off section is Appendix OP-03A.

QEMS Ontario Clean Water Agency	**OPERATIONAL PLAN** Town of Erin DWS	QEMS Doc: OP-03A Rev Date: 2021-09-09 Rev No: 1 Pages: 1 of 1

SIGNED COMMITMENT AND ENDORSEMENT

This Operational Plan sets out the framework for OCWA' Quality & Environmental Management System (QEMS) that is specific and relevant to your drinking water system(s) and supports the overall goal of OCWA and the Corporation of the Town of Erin (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 Town of Erin DWS 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.

Don Irvine — Sept 13/21
Senior Operations Manager, Highlands — Date

Nathan Hyde — 9.25.21
Town of Erin, CAO — Date

Mike Mortimer — Oct 22/21
Regional Manager, Georgian Highlands — Date

Nick Colucci — Oct 25/21
Town of Erin, Director of Infrastructure — 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: PCT	Approved by: Senior Operations Manager

1. Purpose

To identify and describe the specific roles and responsibilities of the QEMS Representative(s) for the Town of Erin DWS.

2. Definitions

None

3. Procedure

3.1 The role of QEMS Representative for the Town of Erin DWS is the Process and Compliance Technician (PCT). The Safety, Process and Compliance Manager (or designate) will act as an alternate QEMS Representative when required.

3.2 The QEMS Representative is responsible for:

- Administering the QEMS for the Town of Erin DWS 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
2018-09-21	0	Procedure issued – Information within OP-04 was originally set out in the main body of OCWA's Operational Plan (last revision 7 dated 2017-09-25). New Purpose, Definitions, Procedure, Related Documents and separate Revision History sections. Change to responsibilities: Operations Manager no longer considered QEMS Representative and SPC Manager to act as alternate as required (s. 3.1); added wording to clarify shared responsibilities for Top Management and QEMS Representative to ensure operations personnel are aware of applicable legislative and regulatory requirements (section 3.2).
2019-08-14	1	3.1 Revised to include "or designate" in place of alternate PCT

DOCUMENT AND RECORDS CONTROL

Reviewed by: PCT	Approved by: Senior Operations Manager

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 Town of Erin DWS, 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 issue 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 authorized approval, alpha-numeric procedure code, issue date, page numbers on every page, revision number and revision history.

Authorized personnel for review and approval of this Operational Plan are:

Review	QEMS Representative
Approval	Operations Management, SPC Manager

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 and policies outlining specific conditions of use.

Access to facility QEMS records contained within internal electronic databases and applications (e.g., Wonderware, 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, (in writing) 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 of the document is promptly removed from its location and forwarded to the QEMS Representative for disposal or retention (as appropriate).

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

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
DWQMS Operational Plan	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 all the documents/records listed in Table 1)	3 years*if no specified legislative requirement below*	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 (LMR) and THM, HAA, nitrates, nitrites and lead program sampling and testing, Section 11 Annual Reports and Schedule 22 Summary Reports	6 years	O. Reg. 170/03
Sodium test results and related corrective action records/reports, 60 month fluoride test results (if the system doesn't fluoridate), Engineering Reports	15 years	O. Reg. 170/03
Lead samples, correction 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

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 policy 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
2018-08-02	0	Procedure issued. (D. Irvine)

DOCUMENT AND RECORDS CONTROL LOCATIONS

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

Type of Document/Record	Designated Document Control Location (HC = Hardcopy, E = Electronic)
Internal QEMS Documents	
Operational Plan (includes QEMS Procedures)	E – Shared Drive HC – Hub Office
QEMS Reference Manual	E – OCWA's intranet
QEMS Policy	E – OCWA's intranet and public website HC – Facility
Facility Emergency Plans	E – Shared Drive HC – Facility
Emergency Response Plan (corporate)	E – OCWA's intranet
Standard Operating Procedures (referenced in Operational Plan and QEMS Procedures)	E – Shared Drive HC – Facility
Laboratory Manual	E – Shared Drive
Essential Supplies & Services List	E – Shared Drive HC – Facility FEP Binder
Shift/Vacation Schedule	E – Hub Calendar
On-call Schedule	HC – Hub Office
Round Sheet Form	E – Shared Drive HC – Facility
Sampling Schedule/Plan/Calendar	E – Shared Drive HC – Facility
Chain of Custody Forms	E – Shared Drive
OPEX Database Action Plan Form (Preventive/Corrective) /Action Plan Summary Spreadsheet (Preventive/Corrective Form)	E – Shared Drive
External QEMS Documents	
Maintenance/equipment manuals	E – Maximo HC - Facility
Engineering schematics/plans/drawings	E – Shared Drive
Municipal Drinking Water Licence	E – Shared Drive
Drinking Water Works Permit	E – Shared Drive
Permit to Take Water	E – Shared Drive
Operator certificates	E – Shared Drive
Overall Responsible Operator Certifications	E –Shared Drive
Overall Responsible Operator Posting	E – Shared Drive HC – Facility
AWWA Standards	E - \\Torwan\PCT\AWWA Standards
DWQMS Standard	E - https://www.ontario.ca

DOCUMENT AND RECORDS CONTROL LOCATIONS

Type of Document/Record	Designated Document Control Location (HC = Hardcopy, E = Electronic)
ANSI/NSF product registration documentation for Chemicals/Materials Used	E – Shared Drive
Applicable federal and provincial legislation and municipal by-laws	Online at www.e-laws.gov.on.ca
Operations Manual	HC - Facilities
Source Water Protection Plan	E – Shared Drive
QEMS Records	
Rounds sheets	HC - Facility E – Process data maintained electronically through PDM
Facility Operations Logbook(s)	HC – Facilities
Visitor's Logbook	HC – Facilities
Operator training records	HC – Hub Office E - maintained in OCWA's Training Summary dB
Maintenance records	E - maintained in WMS
Internal Calibration records	HC – Facility E - maintained through WMS
External Calibration records	HC – Facility E – Shared Drive
Chain Custodies	HC – Hub Office E – Shared Drive
Laboratory analyses	HC – Hub Office Electronic reports from Laboratory - E - maintained through PDM
Additional Sampling records	n/a
In-house laboratory results	HC – Hub Office E - maintained through PDM
SCADA Records (Wonderware, OCWA)	HC – Facility E - maintained through Wonderware
SCADA Records (Plant SCADA, Client Owned)	HC – Facility
Internal QEMS audit reports	E – Shared Drive
External audit and inspection reports	E – Shared Drive
Management Review documentation	E – Shared Drive
OPEX Database Action Plan records (Preventive/Corrective) /Action Plan Summary Spreadsheet (Preventive/Corrective records	E – Shared Drive
Internal QEMS Communications	E – Emails/ Shared Drive
External QEMS Communications	HC – Hub Office
Annual Reports	E – Shared Drive

DOCUMENT AND RECORDS CONTROL LOCATIONS

Type of Document/Record	Designated Document Control Location (HC = Hardcopy, E = Electronic)
	HC – Hub Office
Summary Reports for Municipalities	E – Shared Drive HC – Hub Office
AWQI Reports	E – Shared Drive
Infrastructure review (capital/maintenance works recommendations)	E – Shared Drive HC – Hub Office
Community complaint records	HC – Hub Office E – WMS database
Call In Reports	WMS database

Revision History

Date	Revision #	Reason for Revision
2018-08-02	0	Procedure Issued. (D. Irvine)
2019-09-03	1	Updated controlled documents list – Added Overall Responsible Operator Posting, Maintenance/equipment manuals hard copy, removed Plant Tour Records (n/a), changed location of Operational Plan HC to Shelburne Hub Office
2019-11-03	2	Updated controlled documents list- made office locations more generalized, removed Vacation Schedule HC
2020-09-04	3	Updated controlled document list - OPEX Database Action Plan Form (Preventive/Corrective) /Action Plan Summary Spreadsheet (Preventive/Corrective Form) - Update description as it is no longer captured in OPEX database – Updated Community complaint records no longer captured in OPEX
2021-09-09	4	Updated QEMS Records – Rounds Sheets to reflect the replacement of PDC with PDM

1. Purpose

To document the following for the Town of Erin Drinking Water Systems:

- 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

The descriptions of the Town of Erin Drinking Water Systems are outlined in Appendices OP-06A and OP-06B, where:

- OP-06A is the Erin Drinking Water System
- OP-06B is the Hillsburgh Drinking Water System

Each description will include the following information:

- Drinking Water System Overview
- Source Water

  - *General Characteristics*
  - *Common Fluctuations*
  - *Threats*
  - *Operational Challenges*
- Treatment System Description
- Treatment System Process Flow Chart
- Description of the Distribution System Components

4. Revision History

Date	Revision #	Reason for Revision
2018-08-02	0	Procedure issued. (D. Irvine)
2019-09-03	1	Section 3 Procedure – Added details for DWS listings

3.1 Drinking Water System Overview

The Town of Erin is the Owner and OCWA is the Operating Authority for the Erin Drinking Water System.

The Erin Drinking Water System is a Class 3 Water Distribution and Supply Subsystem. The Drinking Water System Number is 220000013. It is a groundwater supply system serving a population of approximately 3000 people. There are approximately 911 residential and approximately 108 non-residential properties connected.

Water is supplied from two wells drilled into fractured limestone. These two wells have a total permitted capacity of 4,128 m³/day. In 2016 the average daily pumping was 769 m^3/d and the maximum day was 1621 m^3/d. The pressure in most of the Erin Municipal Water System is maintained by a 1,703 m³ water tower; however 65 residences in the Erin Heights Subdivision require a booster pump to maintain adequate pressure. Well #7 is 43 meters deep and located at 9555 Side road 17 and Well #8 is 46 meters deep and located at 5555 8th Line. A generator located in Well #8's pump house allows the well to provide water to the distribution system during electrical outages. The Water quality is very good with low sodium and nitrate levels. Hardness of around 300mg/L in Well # 7 and 370 mg/L in Well #8. As such many homes have installed water softeners.

3.2 Source Water

The source water for the Erin Drinking Water System is supplied by the following:

- Well E7
- Well E8

Well E7

Well E7 is located at 9555 Side road 17 approximately 850 m west of Wellington Road #124 - UTM Co-ordinates – 17T 0573420E 4847250N.

General Characteristics

The land use around Well #7 is a mix of industry, agriculture and recreational. There is also a significant amount of wetland adjacent to the property. The well is permitted for 1800 liters per minute and 2160 cubic meters [2,160,000 liters] per day. The 100 mm diameter metered well discharge line outlets to a 245.7m3 baffled concrete chlorine contact reservoir which provides a minimum chlorine contact time of 21.12 minutes. The station is equipped with two 40 Hp vertical turbine high lift pumps with a rated capacity of 1800 LPM, used for the purpose of pumping water from the reservoir through a 100 mm diameter water meter. The piping splits inside the building and a portion pressurizes the high pressure zone that supplies water to the Erin Heights Subdivision. The excess water travels through a pressure sustaining/relief valve to feed the lower pressure portion of the distribution system and fill the water tower. Well #7 can also feed the lower pressure zone

and fills the tower through a second pressure sustaining and reducing valve located in a chamber between #21 and #23 Erin Heights Dr.

The water well record for Well E7 shows 11.9 m of overburden material above bedrock. The material is described as consisting of sand silt and gravel. The well is 43m in depth with all of the bedrock described as limestone. The well was re-drilled in 2004 and double cased. The outer 33cm casing is 26 meters and the inner 26cm casing is 33.7 meters. The top of the casings are approximately one meter above grade and located in the well house. The well is considered to be an artesian well with a static head of approximately one meter.

This well is not considered to be GUDI [Groundwater Under the Direct Influence of Surface Water]. Detailed pumping tests, conducted in conjunction with pumping Well E8 showed no apparent hydraulic connection to the local surface water indicating that there is not a significant component of local recharge to the well, and that the bedrock aquifer is well connected and that water could be drawn from a large area.

A monitoring well was installed in 2009 at the edge of the two year capture zone and adjacent to an auto recycler. This well will be used to monitor ground water quantity and quality.

Common Fluctuations

Water quality data collected did not indicate any impact from a surface source as a result monitoring beyond that required by the Regulation is not required. Adjacent long time industrial uses are present however water sampling has not revealed any related water quality issues.

Threats

Adjacent long time industrial uses are present however water sampling has not revealed any related water quality issues.

Operational Challenges

The operational challenges within the Erin Drinking Water System are seasonal high demand in summer and there are older homes that are common to frozen services in winter season.

<u>Well E8</u>

Well E8 is located at 5555 Eighth Line approximately 350 meters south of 17 Side Rd UTM Co-ordinates 17T 0573337E 4846610N.

General Characteristics

Well #8 is located approximately 50 meters south of the West Credit River and is slightly elevated above the flood plain. The land surface slopes towards the river. The pump house is a masonry structure with the well located outside in a concrete well tile.

The 46 meter double cased well was drilled in 1991. The outer casing diameter is 350 mm and extends to a depth of 6.7 m. The inner casing has a diameter of 200 mm and extends to a depth of 8.53 m. The 20 Hp submersible well pump has a capacity of 1636 LPM. The well discharges through a 150mm buried water main that enters the pump house through the floor. Chlorine is then added and the water is metered before being discharged into the north cell of the reservoir. The reservoir is baffled and has a volume of 160.1 m^3. Chlorine retention time for this reservoir under full flow conditions is 27.6 minutes.

The pump house is equipped with two submersible high lift pumps. The 11 Hp pump has a rated capacity of 348 LPM at 68 m TDH. This pump is used to maintain pressure in the higher pressure zone that services the higher homes in the Erin Heights Subdivision. The 54 Hp pump has a rated capacity of 1740 LPM at 75 m TDH. This pumps primary function is to fill the water tower through pressure sustaining/relief valves while feeding the lower pressure portion of the distribution system. One of these pressure sustaining/relief valves is located in the Well #7 Pump house and the other in a chamber between #21 and #23 Erin Heights Dr.

The water well record for Well E8 shows sand, clay and gravel present to a depth of 6.6 meters below ground surface [mbgs] and is cased to 8.5 mbgs. The remainder of the well is an open hole in limestone to a total depth of 46.0 mbgs. The well has a small artesian head during non-pumping conditions. A detailed pumping test conducted prior to the well being brought into production revealed that there was no noticeable hydraulic connection between the municipal well and the surface water. Water quality data collected did not indicate any impact from a surface source as a result monitoring beyond that required by the Regulation is not required. This well is also not considered to be GUDI [Groundwater under the direct influence of surface water].

A monitoring well was installed in 2009 at the edge of the two year capture zone. This well will be used to monitor ground water quantity and quality.

Common Fluctuations

Water quality data collected did not indicate any impact from a surface source as a result monitoring beyond that required by the Regulation is not required. Adjacent long time industrial uses are present however water sampling has not revealed any related water quality issues.

Threats

Adjacent long time industrial uses are present however water sampling has not revealed any related water quality issues.

Operational Challenges

The operational challenges within the Erin Drinking Water System are seasonal high demand in summer and there are older homes that are common to frozen services in winter season.

3.3 Treatment System Description

Primary and secondary disinfection systems utilize chlorine gas. The facility also contains associated chlorination, control, ventilation, electrical, communication, monitoring and associated appurtenances within the pump house.

3.4 Treatment System Process Flow Chart

Refer to Appendix A in OP-06A for schematics

3.5 Description of the Distribution System Components

The distribution system has approximately 26.055 km of water mains with 154 fire hydrants.

3.5.1 Elevated Storage Tank

An elevated storage tank constructed with a concrete pedestal and coated steel tank controls the operation of the wells in the Erin Municipal Drinking Water System. The elevated tank was constructed in 1990 and is located on a hill at the west end of the unopened portion of Lions Park Avenue. Access is from the end of March St and the civic number is 3 William St. It has a storage capacity of 1703 m^3 between the minimum and maximum operating water elevations of 447.00 m and 437.70 m. The tower maintains pressure when pumps are not running and supplies water during high use periods

3.5.2 Frank Smedley Booster Pumping Station (FSBPS) – Located in Victoria Park

The Frank Smedley Booster Pumping Station (FSBPS) was installed in 2014, and mainly delivers water from the lower zone to the upper pressure zone. However, the FSBPS will also allow reverse flow from the upper zone to the lower pressure zone in times of need.

The upper and lower pressure zones are interconnected at the FSBPS and a Pressure Reducing Valve (PRV) chamber at the intersection of Barbour Drive and Orangeville Street. If the lower pressure zone depressurizes, the PRV at FSBPS or the PRV at the Barbour Drive chamber will open to supply water to the lower zone from the upper zone. The Barbour/Orangeville chamber includes a 200, PRV that addresses high flow demands of the LPZ and a smaller more sensitive 50mm PRV for low flow demand periods of the LPZ. The 50mm PRV also incorporates an internal check valve which has allowed operators to feed the UPZ from the LPZ in the past, but with a limited attainable pressure. The PRV at FSBPS will open first to supply water to the lower pressure zone with the Barbour PRV acting as standby.

The FSBPS also includes a check valve that will allow water to flow from the lower pressure zone to the upper pressure zone if the upper pressure zone depressurized during an emergency.
Well 2 (Hillsburgh Heights) pumping station includes fire pumping capacity for the upper pressure zone. In the event of a fire in the lower pressure zone, the PRV at FSBPS or Barbour Drive will open to supply fire flow demands.

The FSBPS currently includes two pumps which draw water from the lower pressure zone to supply water to the upper pressure zone. These pumps operate on variable frequency drive with a pressure transducer feedback to maintain a target operating pressure of 682 kPa (99 psi) on pump station discharge. This pump station discharges pressure equates to approximately 310 kPa (45 psi) in the highest ground elevation within the upper pressure zone and approximately 663 kPa (96 psi) in the lowest ground elevation within the upper pressure zone.

If the minimum pump speed exceeds water demands, the pump will automatically turn off. Pressure is maintained briefly by two Pressure Tanks and the pumps resume operation once pressure drops to 613 kPa (89 psi) (68 kPa or 10 psi below the operating target). Normally only one pump is needed to reach the 99 psi set point. However, if flow must be greater than approximately 5 l/s that standby pump will automatically run.

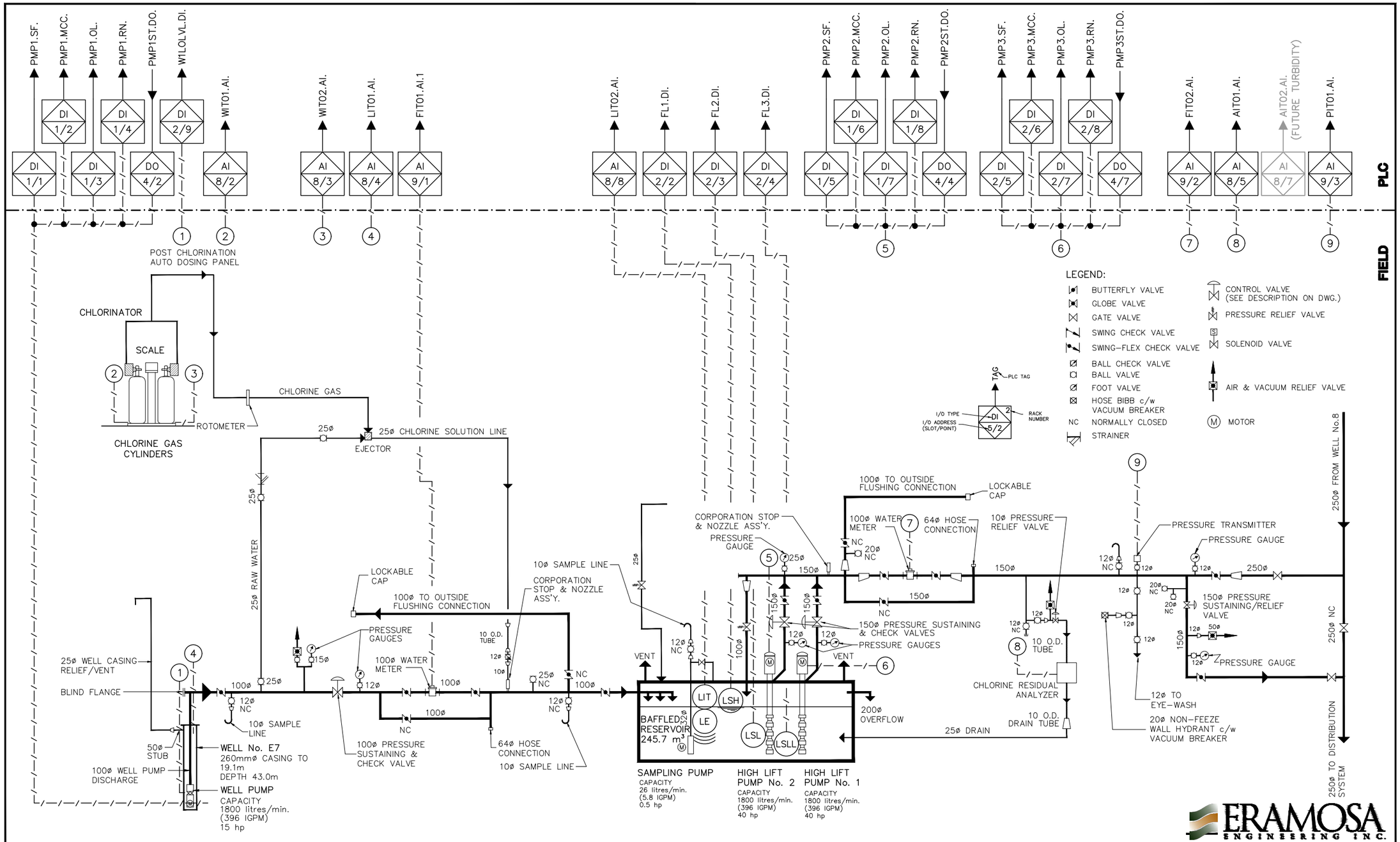
A limiting switch on the pump stations' PS/RV (PRV101) prevents the pump from running when the valve is open. The PRV101 will open if the UPZ exceeds 792 kPa (115 psi) thereby protecting the UPZ distribution network from damage. The valve will also open if the LPZ drops below 414 kPa (60 psi) (as read at the FSBPS), but only if the UPZ is above 524 kPa (76 psi). In the future, this feature will allow the UPZ to supply water to the LPZ without risk of starving the UPZ if the Barbour/Orangeville PRVs are upgraded to PS/RVs.

4 Related Documents

Facility schematics

5 Revision History

Date	Revision #	Reason for Revision
2018-09-26	0	Procedure issued. (D. Irvine)
2019-09-09	1	Added distribution map
2020-09-09	2	Added Operational Challenges to section 3.2



NOTES

1. DRAWING IS BASED ON TRITON ENGINEERING DRAWING DATED APRIL 2005.

No	DATE	REVISION	INITIAL
7	FEB. 2017	PROCESS UPDATE	J.W
6	AUG. 2013	PROCESS UPDATE	M.M
5	JULY 2011	PROCESS UPDATE	J.W.
4	APRIL 2009	INSTRUMENTATION I/O ADDED	S.L.R.
3	AUG. 2005	RECORD DRAWING	C.M.F.
2	MAY 2004	ISSUED FOR RE-TENDER	C.M.F.
1	FEB. 2004	ISSUED FOR TENDER	C.M.F.

PUMP HOUSE & RESERVOIR WELL E7

TOWN OF ERIN
5684 WELLINGTON RD. No. 24, P.O. BOX 250
HILLSBURGH, ONTARIO, N0B 1Z0

SITE WORK
SCHEMATIC

PROJECT No
T1013

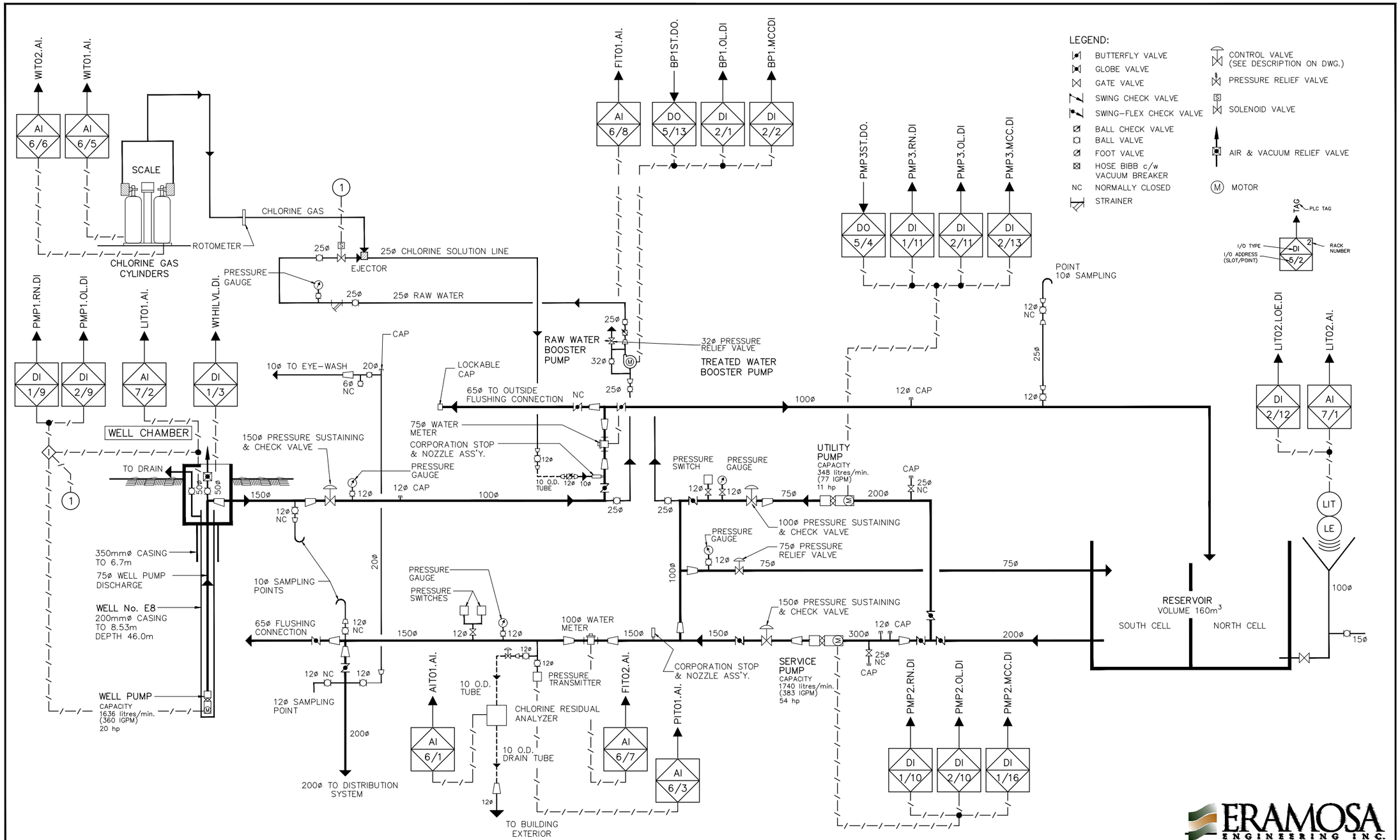
DRAWN BY: D.R.T. (MACKIE)
CHECKED BY: C.M.F.
APPROVED BY: D.B.M.
DATE: JUNE, 2002

TRITON ENGINEERING SERVICES LIMITED
Consulting Engineers

SCALES
NOT TO SCALE
HORIZONTAL VERTICAL

DRAWING NUMBER 10-02

ERAMOSA ENGINEERING INC.



NOTES

1. DRAWING IS BASED ON TRITON ENGINEERING DRAWING DATED APRIL 2005.
2. SERVICE AND UTILITY PUMPS ARE MOUNTED INSIDE THE PIPES.

No	DATE	REVISION	INITIAL
7	FEB. 2017	PROCESS UPDATES	M.M.
6	AUG. 2013	PROCESS UPDATES	M.M.
5	JULY 2011	PROCESS UPDATES	J.W.
4	APRIL 2009	INSTRUMENTATION I/O ADDED	S.L.R.
3	AUG. 2005	RECORD DRAWING	C.M.F.
2	MAY 2004	ISSUED FOR RE-TENDER	C.M.F.
1	FEB. 2004	ISSUED FOR TENDER	C.M.F.

PUMP HOUSE & RESERVOIR WELL E8

TOWN OF ERIN
5684 WELLINGTON RD. No. 24, P.O. BOX 250
HILLSBURGH, ONTARIO, N0B 1Z0

SITE WORK
SCHEMATIC

PROJECT No T1014

DRAWN BY: D.R.T. (AUTOCAD)
CHECKED BY: C.M.F.
APPROVED BY: D.B.M.
DATE: SEPT., 2002

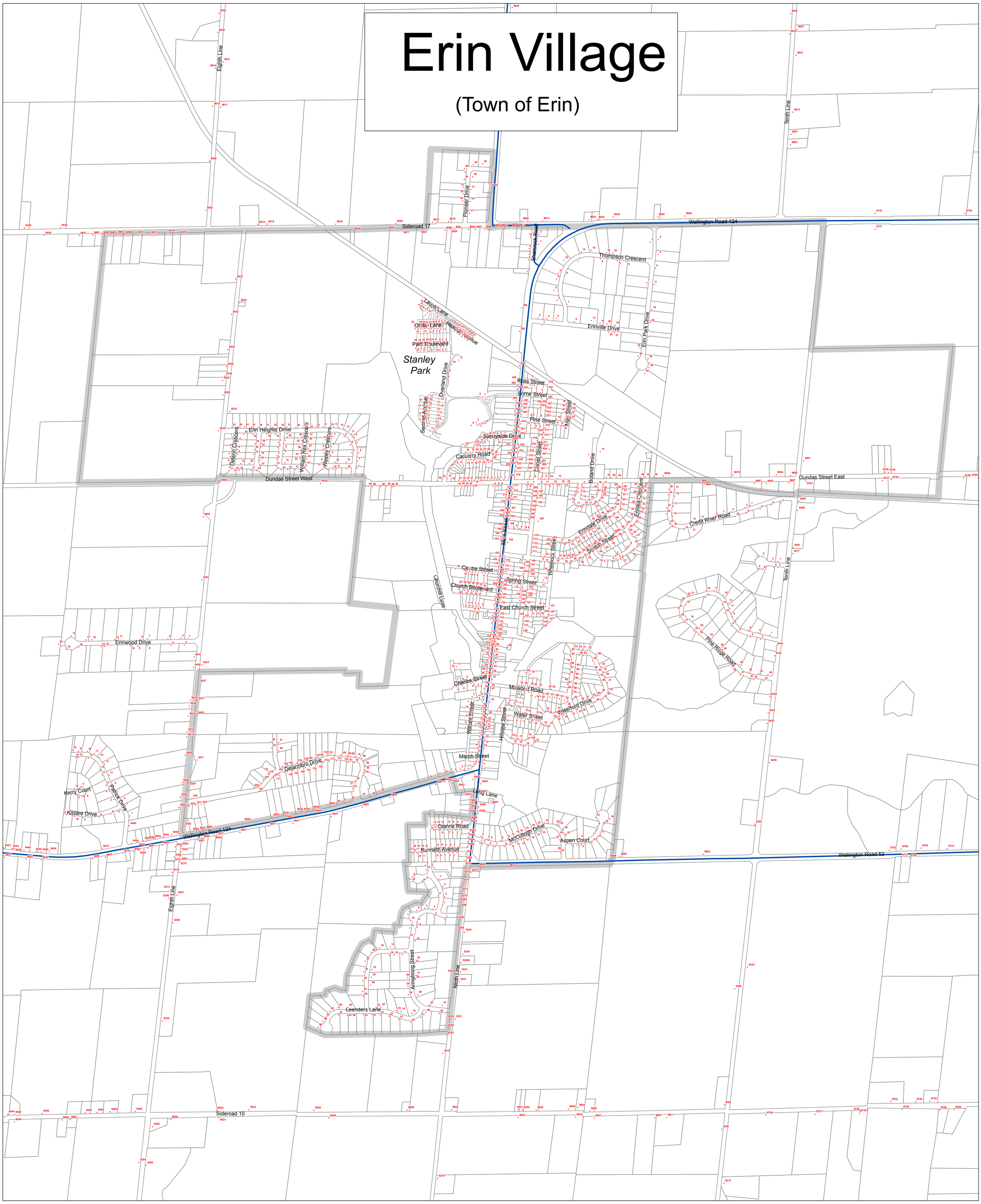
TRITON ENGINEERING SERVICES LIMITED
Consulting Engineers

SCALES
NOT TO SCALE
HORIZONTAL VERTICAL

DRAWING NUMBER 10-02

Erin Village

(Town of Erin)



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Sources:
County of Wellington Planning and Development Department 2016.

Date Printed: May 30, 2016.

0 250 500 1,000
Metres

VILLAGE OF ERIN

WATER DISTRIBUTION SYSTEM

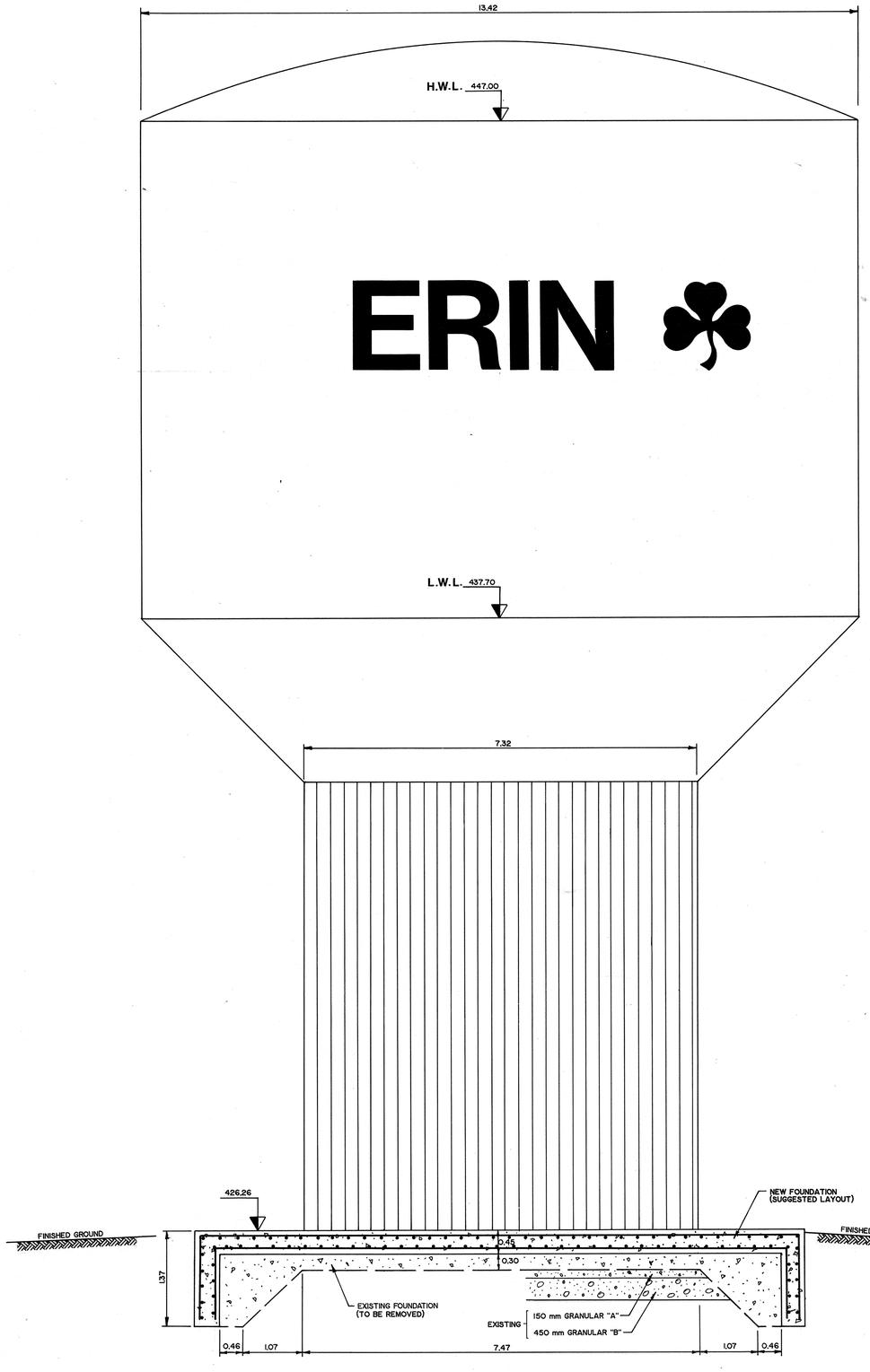
CONTRACT Nº 3

DATE : MARCH 1989

ELEVATED WATER STORAGE FACILITY

GAMSBY AND MANNEROW LIMITED
Consulting Professional Engineers
Guelph – Owen Sound
Project Nº M-151

MINISTRY OF THE ENVIRONMENT
Direct Grant Project
Nº 7-0460



CAPACITY 375,000 IMPERIAL GALLONS

HEAD DIFFERENCE 9.3 m

NOTES:

THE POSITION OF POLE LINES, CONDUITS, WATERMAINS, SEWERS AND OTHER UNDERGROUND AND OVERGROUND UTILITIES AND STRUCTURES IS NOT NECESSARILY SHOWN ON THE CONTRACT DRAWINGS, AND, WHERE SHOWN, THE ACCURACY OF THE POSITION OF SUCH UTILITIES AND STRUCTURES IS NOT GUARANTEED.

BEFORE STARTING WORK, THE CONTRACTOR SHALL INFORM HIMSELF OF THE EXACT LOCATION OF ALL SUCH UTILITIES AND STRUCTURES, AND SHALL ASSUME ALL LIABILITY FOR ANY DAMAGE DONE TO THEM.

Nº	DATE	REVISION DESCRIPTION	CHECKED
2	NOV /89	ISSUED FOR CONSTRUCTION	
1	OCT /89	ISSUED FOR TENDER	
A	MARCH 1989	FOR M.O.E. APPROVALS	

REGISTERED PROFESSIONAL ENGINEER — J. T. BRYSON — PROVINCE OF ONTARIO

P. Eng.

VILLAGE OF ERIN

WATER DISTRIBUTION SYS.

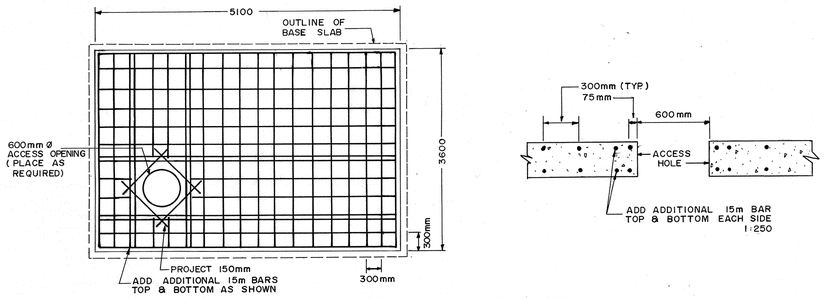
MINISTRY OF ENVIRONMENT
PROJECT NO.

ELEVATED WATER STORAGE

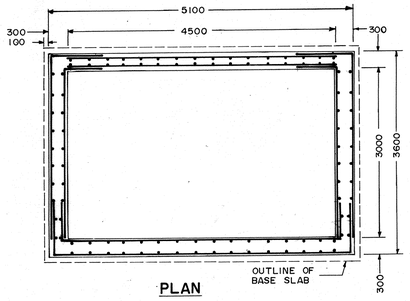
GAMSBY AND MANNEROW LIMITED
Consulting Professional Engineers
GUELPH – HALTON HILLS – OWEN SOUND

DRAWN BY:	APPROVED BY:	PROJECT Nº:	DRAWING Nº:
P.V.	J.B.	M-151	3
DESIGNED BY:	DATE:	SCALE:	
	APRIL /87	1 : 50	

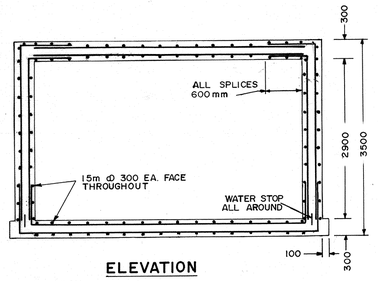
detail of water storage Facility



ROOF REINFORCEMENT PLAN & CROSS-SECTION



PLAN

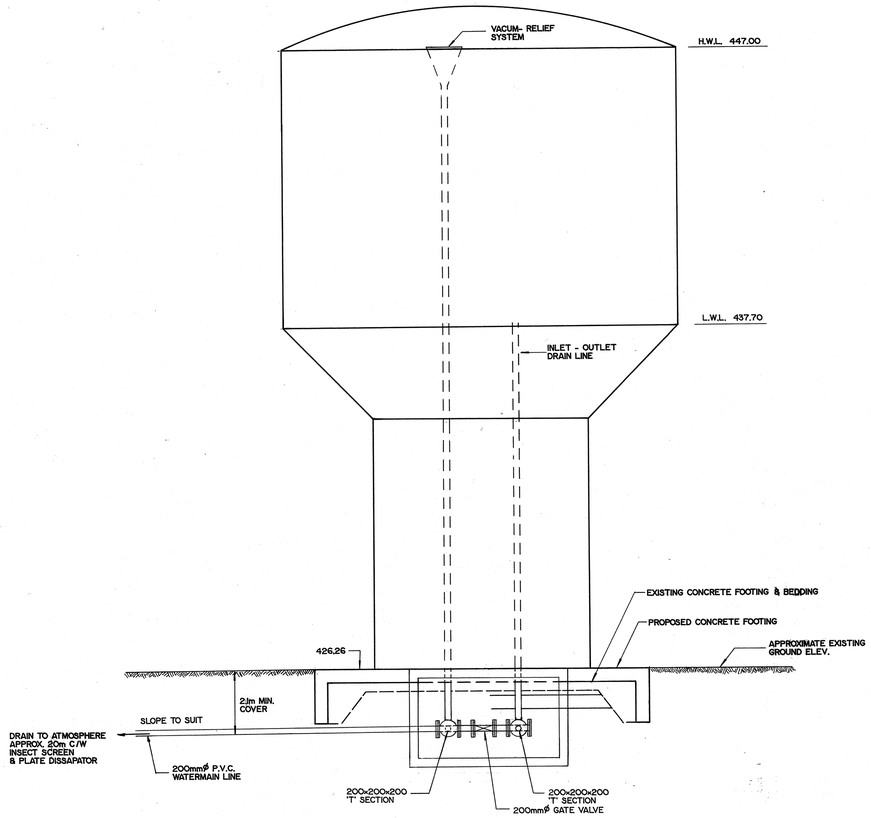


ELEVATION

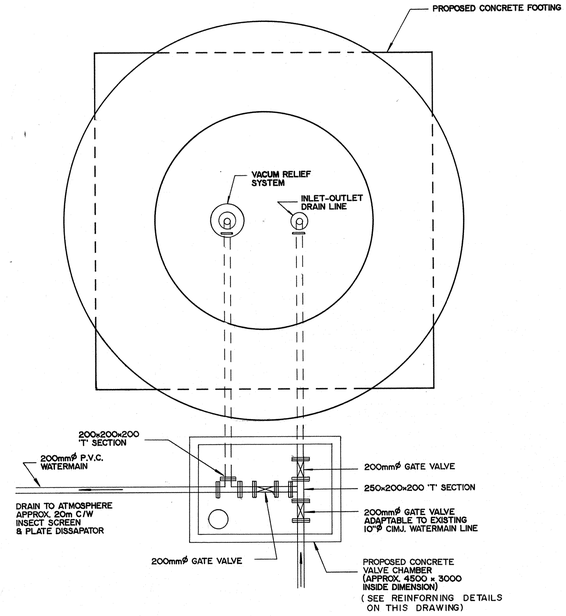
VALVE CHAMBER
(REINFORCING DETAILS)
SCALE 1:50

NOTES:

1. PLACE THE REINFORCING BAR IN THE SHORT DIRECTION CLOSET TO THE FACE OF THE CONCRETE.
2. ALL REINFORCING TO HAVE 75mm CLEARANCE TO FACE OF CONCRETE.



ELEVATION



PLAN

NOTES:

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NO	DATE	REVISION DESCRIPTION	CHECKED
2	NOV /89	ISSUED FOR CONSTRUCTION	
1	OCT /89	ISSUED FOR TENDER	
A	AUG. /89	FOR M.O.E. APPROVAL	

REGISTERED PROFESSIONAL ENGINEER — J. T. BRYSON — PROVINCE OF ONTARIO

P. Eng.

VILLAGE OF ERIN

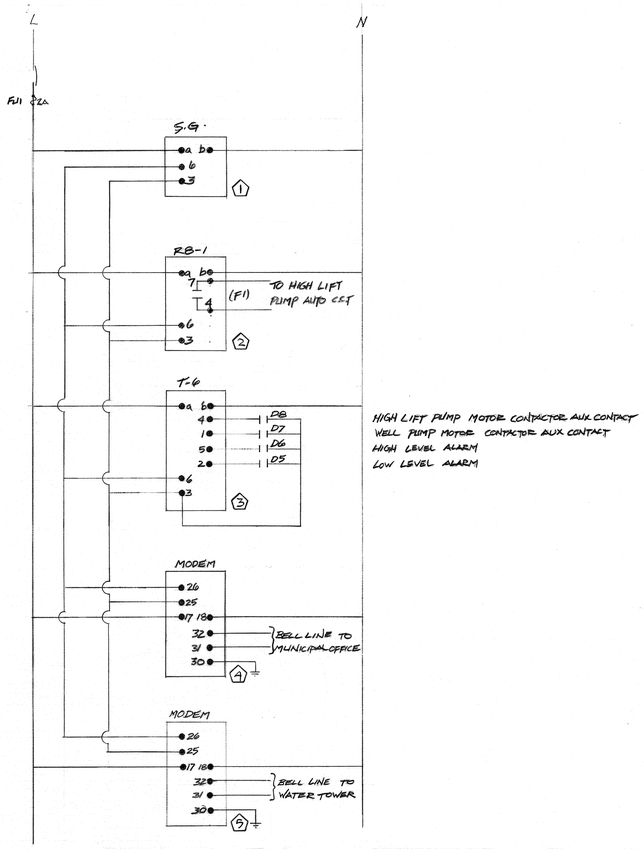
WATER DISTRIBUTION SYS.

MINISTRY OF THE ENVIRONMENT
PROJECT No. 7-0460

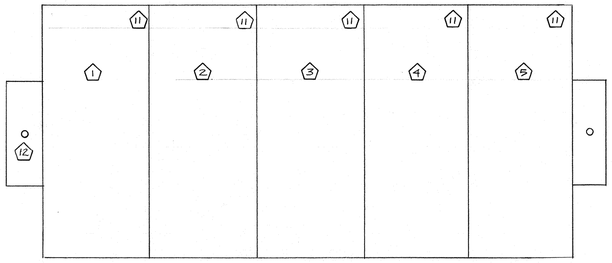
PROPOSED DRAINAGE & OVERFLOW DETAIL FOR WATER STORAGE FACILITY

GAMSBY AND MANNEROW LIMITED
Consulting Professional Engineers
GUELPH — HALTON HILLS — OWEN SOUND

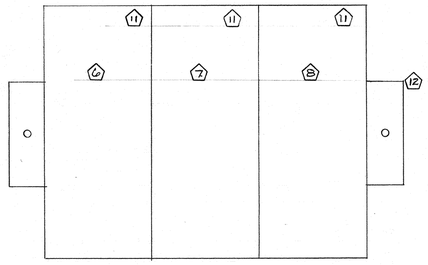
DRAWN BY:	APPROVED BY:	PROJECT NO:	DRAWING NO:
P.D.G.		M - 151	4
DESIGNED BY:	DATE:	SCALE:	
J.B.	AUG. /89	1:100	



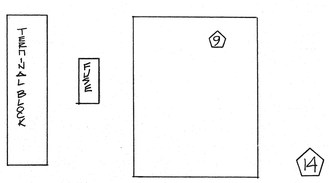
PUMPING STATION No. 2



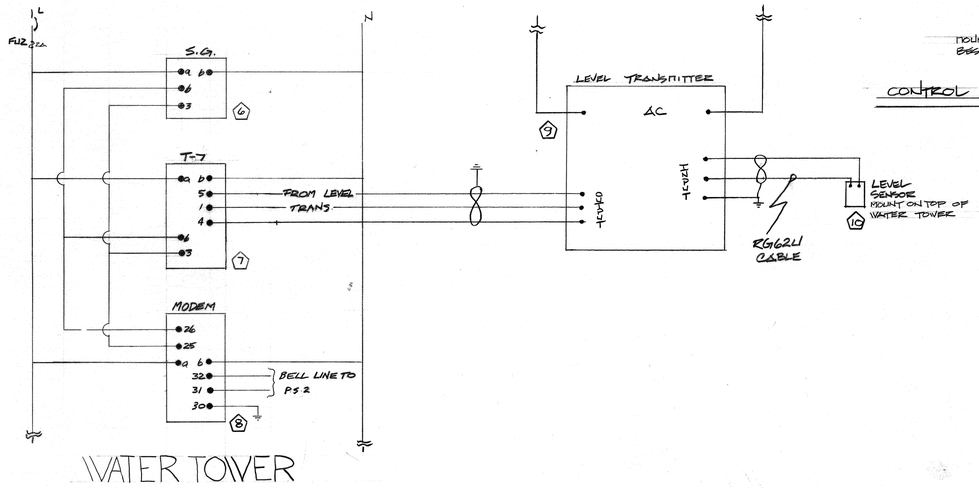
CONTROL PANEL FOR PUMPING STATION NO 2 NTS



CONTROL PANEL FOR WATER TOWER NTS



CONTROL PANEL FOR PUMPING STATION NO 2 NTS



WATER TOWER

MATERIAL SCHEDULE

ITEM	DESCRIPTION	ELECTROMATIC CAT. #	CHANNELS
1	CHANNEL GENERATOR	FPD-1900-120	FMK-64
2	RECEIVER	FAD-1111-120	F1
3	TRANSMITTER	FFD-1440-120	D5-8
4	MODEM	FMX-1903-120	
5	MODEM	FMX-1902-120	
6	CHANNEL GENERATOR	FPD-1900-120	FMK-64
7	TRANSMITTER	FFD-1532-120	E1-8
8	MODEM	FMX-1903-120	
9	LEVEL TRANSMITTER	MILLTRONICS MULTIRANGER	
10	LEVEL SENSOR	MILLTRONICS ST50A	
11	BASE	ELECTROMATIC D411	
12	DIN RAIL	35 MM	
13	CABINET	16" X 12" X 8"	
14	SIMILAR TO 13 BUT WATERPROOF		

NOTES:

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NO	DATE	REVISION DESCRIPTION	CHECKED
1	JAN. /88	ISSUED FOR CONSTRUCTION	
B	DEC./87	FOR TENDERING	
A	AUG./87	FOR M.O.E. APPROVALS	

REGISTERED PROFESSIONAL ENGINEERS — R. M. MONTGOMERY — PROVINCE OF ONTARIO

P. Eng.

VILLAGE OF ERIN

WATER DISTRIBUTION SYS.

MINISTRY OF ENVIRONMENT
PROJECT NO. 7-0460

PUMPING STATION NO 2 & WATER TOWER
ELECTRICAL

GAMSBY AND MANNEROW LIMITED
Consulting Professional Engineers
GUELPH – HALTON HILLS – OWEN SOUND

DRAWN BY:	APPROVED BY:	PROJECT NO:	DRAWING NO:
P.L.H	R.M	87-033	18
DESIGNED BY:	DATE:	SCALE:	
D.G	MAY 87	NOTED	

3.1 Drinking Water System Overview

The Town of Erin owns and OCWA is the operating authority for the Hillsburgh Municipal Water System which is a ground water system serving a population of approximately 850. 291 residences and 3 nonresidential properties are serviced by 7.2 km of water mains and 35 fire hydrants. There are two pressure zones. The Hillsburgh Heights Well [H2] is in the upper pressure zone and the Glendevon Well [H3] is in the lower pressure zone. A pressure sustaining/reducing valve located in a chamber at the intersection of Orangeville St and Barbour Dr separates the two zones. In 2014 the Frank Smedley Booster Pumping Station was installed and mainly delivers water from the lower to the upper pressure zone. The Hillsburgh Heights well water contains naturally occurring lead at a level that is just over the maximum acceptable level of 10 parts per billion. A filter system reduces the lead to approximately 5 parts per billion. Hardness is around 250mg/L in the Hillsburgh Well #2 and 390mg/L in Hillsburgh Well #3. As such many homes have installed water softeners. The Hillsburgh Wells utilize liquid chlorine [Sodium Hypochlorite] systems in its wells. The Hillsburgh Municipal Water System is classed as a Water Distribution and Supply Subsystem Class 2 and Water Treatment Subsystem Class 1 and the Drinking Water System Number is 220007285.

3.2 Source Water

3.2.1 Hillsburgh Well #2 – [Hillsburgh Heights] – located at 5929 Trafalgar Rd. Hillsburgh – UTM Co-ordinates – 17T 0568249E 4849333N

The facility has one well drilled in 1988. It has a 200 mm diameter casing installed to bedrock located at a depth of 51 m. The well is an open hole in the dolostone until it terminates at a depth of 88 m. The well top of casing is located below grade in a concrete chamber. If the well chamber floods an alarm will alert an operator and the well pump will shut down. The vent for the well outlets one meter above grade. The 15 Hp submersible well pump is rated at 802 Lpm but manually controlled to a maximum permitted flow of 682 Lpm. The pump is set at approximately 79 meters. A well level sensor shuts off the well 10 meters above the pump and restarts the pump once the level is 20 meters above the pump.

The Hillsburgh Heights Well [H2] is located near a local topographical high on the north edge of the Village of Hillsburgh. There are agricultural properties to the north and Trafalgar Road to the west The topographical relief is southeasterly towards the West Credit River. There are no surface water sources within the area of the well. Well records indicate that the well is cased to a depth of approximately 51 m below ground surface where the bedrock was encountered. The total depth of the well is 88 m, with the bottom 37 m being an open hole in fractured dolostone. The overburden consists of

sand and gravel with zones of silt and a lower silt till. Surficial geology mapping indicates the area around the well and to the north of the well is ice-contact sand and gravel.

The extensive depth of the cased portion of the well minimizes the potential for contamination from a surface source unless there is a break in the casing.

The Hillsburgh Municipal Water System has been part of the MOE Drinking Water Surveillance Program since the late 1990's. Chloride concentrations appear to be slightly above the background concentrations found elsewhere in the community, however they are quite low. Nitrate concentrations indicate the presence of detectable nitrate, once again the present chemical concentrations are very low and not a concern unless there is a trend of increasing concentration over time. The well contains low levels of radionuclide and was sampled every 3 years, however this is no longer a requirement but is sampled every 5 years for water quality monitoring.

A pump test conducted in 1998 reduced the well level from a static level of 35 meters below top of casing to 46 meters after four hours of pumping. The pump is set at approximately 79 meters. The well recovered to 38 meters within 15 minutes. It should be noted that 1998 was near the end of a dry period for this area.

3.2.2 H3 – located in Victoria Park – UTM Co-ordinates – 17T 0568947E 4849085N, Glendevon Pump House and Reservoir is located at the intersection of Mill Street and Covert Lane – UTM Co-ordinates – 17T 0569054E 4849008N

The Glendevon Well H3 was drilled in 1996 and is approximately 57.9 m deep. The casing diameter is 200 mm and extends to a depth of 20.1 m. H3 is equipped with a 5 Hp submersible pump with a capacity of 456 LPM. The pump is set at approximately 25.6 meters. The pump house is a masonry structure constructed in 1969. The station is equipped with one 10 Hp high lift pump with a rated capacity of 605 LPM. This pump pumps water from the reservoir to the distribution system.

The well is located in a park near the core area of the community of Hillsburgh and is surrounded by residential development. The well is located approximately 110 meters from the West Credit River and is in an area of relatively low relief.

Water well records shows that the well is cased to a depth of approximately 20.1 mbgs, where the bedrock was encountered. The total depth of the well is 57.9 mbgs. The overburden is described as sand and clay with gravel zones. The bedrock is described as limestone.

3.3 Treatment System Description

3.3.1 Hillsburgh Well #2 – [Hillsburgh Heights] Chlorine is added before the water is discharged into a two celled in-ground concrete chlorine contact chamber/reservoir with a total storage capacity of 545.5m³. The baffled reservoir has two separate parallel compartments and provides a minimum chlorine contact time of 21.6 minutes.

3.3.2 Hillsburgh Well #3 – [H-3] The well discharge pipes are connected to a 75 mm diameter water meter and discharges into a 245 m³ in-ground, cast-in-place concrete chlorine contact chamber- reservoir. The reservoir has 1 longitudinal baffle and 2 transverse baffles and provides a minimum chlorine contact time of 18.8 minutes.

3.4 Treatment System Process Flow Chart

Refer to Appendix A in OP-06B for schematics

3.5 Description of the Distribution System Components

The 150 mm diameter well discharge line discharges through a 75 mm diameter water meter. Ferric chloride is then added before the water travels through a static mixer and two parallel 300mm contact chamber pipes. The water then passes through two parallel filter chambers that house two 20 micron pelted filters per chamber. A pressure difference gauge monitors the pressure drop across the filters. After the filters, this pump house is equipped with three high lift pumps - A 5 Hp pump rated at 274 LPM; A 7.5 HP pump capable of 820 LPM and a 20 HP fire pump with a rated capacity of 2400 LPM. These pumps transfer water from the reservoir through a 100 mm diameter water meter into the distribution system. The facility is also equipped with a 45 kW standby diesel generator. A single chamber pilot filter system for lead was installed at Well 2 and became operational on May 9 2004. After extensive evaluation of the filter system's performance the process was deemed to be capable of reducing the lead concentration to half the MAC. On August 2, 2004 the MOE issued a Certificate of Approval to install the second filter chamber and the facility is currently equipped with a filter system to maintain lead levels below Ontario Drinking Water Standards maximum acceptable concentration.

Raw Water Characteristics & Common Fluctuations

Water quality data collected as part of MOE Drinking Water Surveillance Programs indicates that there is no noticeable impact from typical surface sources of chemical contamination.

Threats

The potential does exist for contaminant migration from a surface source; however these sources are limited to septic systems and typical urban runoff. The present concentrations of indicator parameters suggest that the capture area of the well has not

been measurably impacted by contamination from surface sources, since the well has been in operation.

Operational Challenges

The operational challenges within the Hillsburgh Drinking Water System are the natural occurring lead and low levels of radionuclides at the Hillsburgh Heights Well Supply, seasonal high demand in summer and there are older homes that are common to frozen services in winter season.

4 Related Documents

Facility schematics

5 Revision History

Date	Revision #	Reason for Revision
2018-09-26	0	Procedure issued. (D. Irvine)
2019-09-09	1	Added distribution map
2020-09-09	2	Added Operational Challenges to section 3.5

PLC

FIELD

WELLPUMP.RUN. — DI 2 / 1/4
WELLEVEL.AI. — AI 2 / 1/3
LEADREMV.ALARM.RAW — DI 1 / 1/10
RWFLOW.RAW. — AI 1 / 3/2
DIFPRESS.AI. — AI 2 / 1/2
RWCHMP.READY.RAW — DI 1 / 1/1
RWCL2P.SWITCH.RAW — DI 1 / 1/3
RWCHMP.ALARM.RAW — DI 1 / 1/13
RWCL2RES.RAW. — AI 1 / 3/4
FIREPUMP.RUN. — DI 2 / 1/5
FIREPUMP.ESTOP.DO — DO 3 / 1/3
HLP2PUMP.RUN. — DI 2 / 1/7
HLP2.ESTOP.DO — DO 3 / 1/2
HLP1PUMP.RUN. — DI 2 / 1/6
HLP1.ESTOP.DO — DO 3 / 1/1
TRFLOW.RAW. — AI 1 / 3/3
DISPRESS.LOW.TMP — DI 1 / 1/11

PUMP CONTROL PANEL (NOTE 2)

CHLORINE PUMP CONTROL PANEL

CHLORINE SOLUTION PUMP No.1

CHLORINE SOLUTION PUMP No.2

DEGASING RETURN LINE

CHLORINE SOLUTION TANK
110 LITRE c/w 126 LITRE SPILL CONTAINMENT

10ø CHLORINE SOLUTION LINE
MAX. DOSAGE RATE 6.6 litres/hr.

LOCKABLE CAP

100ø RAW WATER FLUSHING CONNECTION TO OUTSIDE

WELL CHAMBER

PRESSURE GAUGE

SURGE RELIEF VALVE

10ø SAMPLING POINT

100ø MAG METER

100ø WELL PUMP DISCHARGE

WELL No. H2
200mmø CASING
TO 51.0m
DEPTH 88.0m

WELL PUMP
CAPACITY
802 litres/min.
(176 IGPM)
15 hp

10ø S.S. SAMPLING POINT

CORPORATION STOP

300ø D.I.

300ø PVC

10ø SAMPLING POINT

FILTER No.1

FILTER No.2

VENTS

TO SUMP

FERRIC PUMP CONTROL PANEL

FERRIC CHLORIDE PUMP No.1

FERRIC CHLORIDE PUMP No.2

FERRIC CHLORIDE TANK
227 LITRE c/w 282 LITRE SPILL CONTAINMENT

100ø RAW WATER FLUSHING CONNECTION TO OUTSIDE

RESERVOIR No. 1
VOLUME 273m³

RESERVOIR No. H2
VOLUME 273m³

100ø TREATED WATER FLUSHING CONNECTION TO OUTSIDE

HIGH LIFT PUMP No. 1
CAPACITY
820 litres/min.
(180 IGPM)
7.5 hp

HIGH LIFT PUMP No. 2
CAPACITY
274 litres/min.
(60 IGPM)
5.0 hp

FIRE PUMP
CAPACITY
2400 litres/min.
(528 IGPM)
20 hp

250ø DISCHARGE PIPING

20ø STUB
PRESSURE GAUGE

100ø WATER METER

PRESSURE SWITCH

250ø TO DISTRIBUTION SYSTEM

20ø CAPPED

12ø TO EYE-WASH

10ø SAMPLING POINT

FLOW TUBE

CL2 ANALYZER

TO SUMP

LEGEND:

- BUTTERFLY VALVE
- GLOBE VALVE
- GATE VALVE
- SWING CHECK VALVE
- SWING-FLEX CHECK VALVE
- BALL CHECK VALVE
- BALL VALVE
- FOOT VALVE
- HOSE BIBB
- NC NORMALLY CLOSED
- STRAINER
- BACK PRESSURE VALVE
- CONTROL VALVE (SEE DESCRIPTION ON DWG.)
- PRESSURE RELIEF VALVE
- SOLENOID VALVE
- DP DIFFERENTIAL PRESSURE SWITCH
- AIR & VACUUM RELIEF VALVE
- M MOTOR
- PLC TAG
- I/O TYPE
- I/O ADDRESS (SLOT/POINT)
- RACK NUMBER

ERAMOSA

NOTES

1. DRAWING IS BASED ON TRITON ENGINEERING DRAWING DATED APRIL 2005.
2. PUMP CONTROL PANEL IS SHOWN TWICE FOR DRAWING CLARITY.
3. FLOW METER SIGNAL WIRED TO FERRIC CONTROL PANEL FOR FLOW PACING.

No	DATE	REVISION	INITIAL
7	FEB. 2017	PROCESS UPDATES	J.W.
6	NOV. 2015	PROCESS UPDATES	J.W.
5	AUG. 2013	PROCESS UPDATES	M.M.
4	JULY 2011	PROCESS UPDATES	J.W.
3	APRIL 2009	INSTRUMENTATION I/O ADDED	S.L.R.
2	APRIL 2005	RECORD DRAWING	C.M.F.
1	APRIL 2003	ISSUED FOR TENDER	C.M.F.

PUMP HOUSE & RESERVOIR
HILLSBURGH WELL No. 2

TOWN OF ERIN
5684 WELLINGTON RD. No. 24, P.O. BOX 250
HILLSBURGH, ONTARIO, N0B 1Z0

SITE WORK
SCHEMATIC

PROJECT No T1006

DRAWN BY: g.m. (AutoCAD)
CHECKED BY: C.M.F.
APPROVED BY: D.B.M.
DATE: AUGUST, 2002

TRITON ENGINEERING SERVICES LIMITED
Consulting Engineers

SCALES
N.T.S.
HORIZONTAL VERTICAL

DRAWING NUMBER 10-02

PLC

FIELD

WELLPUMP.RUN.RAW
WELLLEVL.AI.
TWCHMP.ALARM.RAW
RWCHMP.ALARM.RAW
RWFLOW.RAW.TMP
RSVFLOOD.ALARM.RAW
RECL2RES.RAW.
HLPUMP1.RUN.RAW
DISPRESS.LOW.TMP
TRFLOW.RAW.TMP

DI 1/3 | AI 2/3 | DI 1/14 | DI 1/13 | AI 3/2 | DI 1/12 | AI 3/1 | DI 1/4 | DI 1/11 | AI 3/3

CALIBRATION CYLINDER
CHLORINE PUMP CONTROL PANEL
TO RAW WATER
PRIMER BYPASS
6ø SODIUM HYPOCHLORITE DISCHARGE DOSAGE RATE 3.8 litres/hr.
SODIUM HYPOCHLORITE PUMP No.2
SODIUM HYPOCHLORITE PUMP No.1
110 LITRE CHEMICAL DAY TANK c/w SPILL CONTAINMENT
TAP NC
SAMPLING TAP
WATER METER
CORPORATION STOP & NOZZLE ASS'Y.
FLOW CONTROL VALVE
100ø WELL PUMP DISCHARGE
WELL No. H3
VICTORIA PARK
200mmø CASING
TO 20.1m
DEPTH 57.9m
WELL PUMP
CAPACITY
456 litres/min.
(100 IGPM)
5 hp
CASCADE AERATION DEVICE
RESERVOIR
VOLUME 245m³
SAMPLE PUMP
SAMPLING TAP
CHLORINE RESIDUAL ANALYZER
HIGH LIFT PUMP
CAPACITY
605 litres/min.
(160 USGPM)
10 hp
20ø DRAIN
PIT
TO FLUSHING CONNECTION
PRESSURE GAUGE
PRESSURE SWITCH
PRESSURE GAUGE
6ø SAMPLING POINT
TO WALL HYDRANT
TO EYE-WASH
100ø WATER METER IN METER CHAMBER
200ø TO DISTRIBUTION SYSTEM
PRV

LEGEND:

- BUTTERFLY VALVE
- GLOBE VALVE
- GATE VALVE
- SWING CHECK VALVE
- SWING-FLEX CHECK VALVE
- BALL CHECK VALVE
- BALL VALVE
- FOOT VALVE
- HOSE BIBB c/w VACUUM BREAK
- NC NORMALLY CLOSED
- STRAINER
- BACK PRESSURE VALVE
- CONTROL VALVE (SEE DESCRIPTION ON DWG.)
- PRESSURE RELIEF VALVE
- SOLENOID VALVE
- AIR & VACUUM RELIEF VALVE
- (M) MOTOR

TAG: PLC TAG
I/O TYPE: DI
I/O ADDRESS (SLOT/POINT): 5/2
RACK NUMBER: 2

ERAMOSA

NOTES
1. DRAWING IS BASED ON TRITON ENGINEERING DRAWING DATED APRIL 2005.

No	DATE	REVISION	INITIAL
7	FEB. 2017	PROCESS UPDATES	J.W.
6	NOV. 2015	PROCESS UPDATES	J.W.
5	AUG. 2013	PROCESS UPDATES	M.M.
4	JULY 2011	PROCESS UPDATES	J.W.
3	APRIL 2009	INSTRUMENTATION I/O ADDED	S.L.R.
2	MAY 2005	RECORD DRAWING	C.M.F.
1	APRIL 2003	ISSUED FOR M.O.E. TENDER	C.M.F.

PUMP HOUSE & RESERVOIR HILLSBURGH WELL No. 3

TOWN OF ERIN
5684 WELLINGTON RD. No. 24, P.O. BOX 250
HILLSBURGH, ONTARIO, NOB 1Z0

SITE WORK
SCHEMATIC

PROJECT No **T1015**
DRAWN BY: D.R.T. (AUTOCAD)
CHECKED BY: C.M.F.
APPROVED BY: D.B.M.
DATE: SEPT., 2002

TRITON ENGINEERING SERVICES LIMITED
Consulting Engineers

SCALES
NOT TO SCALE
HORIZONTAL VERTICAL

DRAWING NUMBER 10-02

Hillsburgh

(Town of Erin)

Sideroad 27
Howe Street
Trafalgar Road
Hill Street
Wallace Street
Barbour Drive
Orangeville Street
Queen Street
Barker Street
Ellen Crescent
Church Street
Alice Gate
Upper Canada Drive
Leader Court
Ann Street
Mill Street
Covert Lane
George Street
Douglas Crescent
Spruce Street
Sideroad 24
Station Street
Jane Street
Market Street
UNOPENED
Gilbey Lane
Wellington Street
UNOPENED
Eighth Line
Wellington Road 22
Hillop Road

0 250 500 1,000
Metres

Sources:
County of Wellington Planning and Development Department 2016.

Date Printed: May 30, 2016.

The Corporation of the County of Wellington

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 of the Environment, Conservation and Parks (MECP) 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 MECP's "Procedure for Disinfection of Drinking Water in Ontario" 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 all 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 MECP 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

4. Related Documents

OP-08 Risk Assessment Outcomes
OP-20 Management Review
MECP's "Potential Hazardous Events for Municipal Residential Drinking Water Systems"
MECP's "Procedure for Disinfection of Drinking Water in Ontario"

5. Revision History

Date	Revision #	Reason for Revision
2018-08-02	0	Procedure issued (D. Irvine)

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 and OP-08B 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 MOECC's "Potential Hazardous Events for Municipal Residential Drinking Water Systems" are indicated in the appropriate column using the reference numbers in Table 4 of OP-08A and OP-08B.
- 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 and OP-08B

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

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 (Erin DWS)
OP-08B Summary of Risk Assessment Outcomes (Hillsburgh DWS)
OP-14 Review and Provision of Infrastructure
MECP's "Potential Hazardous Events for Municipal Residential Drinking Water Systems"

5. Revision History

Date	Revision #	Reason for Revision
2018-09-21	0	Procedure issued – Information within OP-08 was originally set out in the QEMS Procedure QP-02 Risk Assessment and Risk Assessment Outcomes (last revision 7 dated 2017-09-25). Included separate Appendix for each Drinking Water System and summarized their reference page. Clarified role of QEMS Representative in updating the information in OP-08A to OP-08-I, inclusive, Summary of Risk Assessment Outcomes. Included requirements for how to document the risk assessment outcomes using the tables in OP-08A to OP-08I, inclusive. Clarified responsibility of Operations Management to ensure Critical Control Limits are set and related procedures are developed. Included reference to OP-14 Review and Provision of Infrastructure to emphasize the need for Operations Management to review the risk assessment outcomes during the infrastructure review.

SUMMARY OF RISK ASSESSMENT OUTCOMES

Reviewed by: PCT | Approved by: Senior Operations Manger

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	MOECC Potential Hazardous Event/Hazard Reference # (see Table 4)	Description of Hazardous Event	Possible Outcome (Hazards)	Existing Control Measures	Likelihood	Consequence	Risk Value	CCP?
Primary Disinfection	*2,6,7,8,10*	Low Residual Cl2, improper disinfection, failure of equipment	Unsafe drinking water	Sample water at beginning of reservoir at beginning of day & continuous CL_2 analyzers. Alarmed. Sensor on Vacuum Switch	X	X	X	☒ *Yes – Mandatory CCP* ☐ *Yes – Additional CCP identified for facility* ☐ *No – no control available at this point; therefore not a CCP*
Incoming Source Water	*2,5,6,7,9*	Contaminated source water, crack in well casing	Unsafe drinking water	Weekly sampling for biological hazards, & monthly turbidity.	*1*	*4*	*4*	☐ *Yes – Mandatory CCP* ☐ *Yes – Additional CCP identified for facility* ☒ *No – no control available at this point; therefore not a CCP*
Incoming Source Water	*2,5,6,7,9*	Contaminated source water, local industry/golf course	Unsafe drinking water	Sampling requirements as per legislation, participate in DWSP	X	X	X	☒ *Yes – Mandatory CCP* ☐ *Yes – Additional CCP identified for facility* ☐ *No – no control available at this point; therefore not a CCP*

SUMMARY OF RISK ASSESSMENT OUTCOMES

Reviewed by: PCT | Approved by: Senior Operations Manger

Activity/ Process Step	MOECC Potential Hazardous Event/Hazard Reference # (see Table 4)	Description of Hazardous Event	Possible Outcome (Hazards)	Existing Control Measures	Likelihood	Consequence	Risk Value	CCP?
Incoming Source Water	*2,5,6,7,9*	Contaminated source water - Chemical Spill (includes fuel spills)	Unsafe drinking water	Daily Wellhouse Checks & Secondary Containment	*2*	*4*	*8*	☐ *Yes – Mandatory CCP* ☐ *Yes – Additional CCP identified for facility* ☒ *No – no control available at this point; therefore not a CCP*
Incoming Source Water	*1,2,4,7*	Drought	Reduced supply of source water	Water restriction by-law enforced when necessary	*3*	*2*	*6*	☐ *Yes – Mandatory CCP* ☐ *Yes – Additional CCP identified for facility* ☒ *No – no control available at this point; therefore not a CCP*
Primary disinfection	*2,10*	Loss of chlorine supply	Unsafe drinking water	Sample water at beginning of reservoir at beginning of day & continuous CL_2 analyzers. Alarmed. Well 8 only - could set up liquid supply for short term	X	X	X	☒ *Yes – Mandatory CCP* ☐ *Yes – Additional CCP identified for facility* ☐ *No – no control available at this point; therefore not a CCP*
Primary disinfection	*2,10*	Poor quality of chlorine gas	Unsafe drinking water	All Cl_2 is NSF approved. Sample water at beginning of reservoir at beginning of day & continuous CL_2 analyzers. Alarmed	X	X	X	☒ *Yes – Mandatory CCP* ☐ *Yes – Additional CCP identified for facility* ☐ *No – no control available at this point; therefore not a CCP*

SUMMARY OF RISK ASSESSMENT OUTCOMES

Reviewed by: PCT | Approved by: Senior Operations Manger

Activity/ Process Step	MOECC Potential Hazardous Event/Hazard Reference # (see Table 4)	Description of Hazardous Event	Possible Outcome (Hazards)	Existing Control Measures	Likelihood	Consequence	Risk Value	CCP?
Reservoir	*2,6,7*	Reservoir Failure	Unsafe drinking water	Low level alarm	*3*	*3*	*9*	☐ *Yes – Mandatory CCP* ☐ *Yes – Additional CCP identified for facility* ☒ *No – no control available at this point; therefore not a CCP*
Reservoir	*2,6,7,9*	Pests in reservoir	Unsafe drinking water	Screens placed on all access areas; inspections. Pre Cl_2 monitoring. Weekly sampling	*1*	*3*	*3*	☐ *Yes – Mandatory CCP* ☐ *Yes – Additional CCP identified for facility* ☒ *No – no control available at this point; therefore not a CCP*
To Distribution	*2,6,7,8*	High Lift Pump failure	Loss of supply	Monitor hours on pump, Daily inspections, dialer alarm	*1*	*2*	*2*	☐ *Yes – Mandatory CCP* ☐ *Yes – Additional CCP identified for facility* ☒ *No – no control available at this point; therefore not a CCP*
Treatment	*2,7,9,10*	Power Outage	Loss of supply	Both Wells have backup generators to run system, dialer alarm	*4*	*1*	*4*	☐ *Yes – Mandatory CCP* ☐ *Yes – Additional CCP identified for facility* ☒ *No – no control available at this point; therefore not a CCP*

SUMMARY OF RISK ASSESSMENT OUTCOMES

Reviewed by: PCT | Approved by: Senior Operations Manger

Activity/ Process Step	MOECC Potential Hazardous Event/Hazard Reference # (see Table 4)	Description of Hazardous Event	Possible Outcome (Hazards)	Existing Control Measures	Likelihood	Consequence	Risk Value	CCP?
Treatment	*2,6,7,9,10*	Vandalism/Terrorism	Unsafe drinking water	Alarmed for operator response	X	X	X	☒ *Yes – Mandatory CCP* ☐ *Yes – Additional CCP identified for facility* ☐ *No – no control available at this point; therefore not a CCP*
Treatment	*2,6,7,9,10*	Dialer fails	Loss of supply	Alarm testing, UPS for power outage	*3*	*2*	*6*	☐ *Yes – Mandatory CCP* ☐ *Yes – Additional CCP identified for facility* ☒ *No – no control available at this point; therefore not a CCP*
Treatment	*2,3,4,6,7,8,10*	Brown out, low voltage, loss of phase	Loss of supply	Alarms, loss of a phase trigger dialer	*5*	*2*	*10*	☐ *Yes – Mandatory CCP* ☐ *Yes – Additional CCP identified for facility* ☒ *No – no control available at this point; therefore not a CCP*
Water In-take	*2,6,7*	Well Pump Failure	Loss of supply	Monitor hours on pump, Daily inspection, Visual pump fault indication on SCADA screen, dialer alarm	*3*	*2*	*6*	☐ *Yes – Mandatory CCP* ☐ *Yes – Additional CCP identified for facility*

SUMMARY OF RISK ASSESSMENT OUTCOMES

Reviewed by: PCT | Approved by: Senior Operations Manger

Activity/ Process Step	MOECC Potential Hazardous Event/Hazard Reference # (see Table 4)	Description of Hazardous Event	Possible Outcome (Hazards)	Existing Control Measures	Likelihood	Consequence	Risk Value	CCP?
								☒ *No – no control available at this point; therefore not a CCP*
Incoming Source Water	*1,5,8,9*	Flooding of river, gets into casing	Unsafe drinking water	High water level alarm	*1*	*5*	*5*	☐ *Yes – Mandatory CCP* ☐ *Yes – Additional CCP identified for facility* ☒ *No – no control available at this point; therefore not a CCP*
Treatment	*2,6*	Well pit flooding	Loss of supply, shuts down systems	High water level float, dialer alarm	*2*	*4*	*8*	☐ *Yes – Mandatory CCP* ☐ *Yes – Additional CCP identified for facility* ☒ *No – no control available at this point; therefore not a CCP*
Storage	*2,3,4,6,7,8*	Cavitation of Water Tower, (structural damage) Failure	Loss of Fire protection	Inspection of device on top of tower and large vent	*1*	*5*	*5*	☐ *Yes – Mandatory CCP* ☐ *Yes – Additional CCP identified for facility* ☒ *No – no control available at this point; therefore not a CCP*
Storage	*2,3,6,7*	No communication functionality for pumps	Loss of supply	Communication failure is alarmed. Low level tower alarm, Daily Operator SCADA checks, Flood Alarm	*4*	*2*	*8*	☐ *Yes – Mandatory CCP*

SUMMARY OF RISK ASSESSMENT OUTCOMES

Reviewed by: PCT | Approved by: Senior Operations Manger

Activity/ Process Step	MOECC Potential Hazardous Event/Hazard Reference # (see Table 4)	Description of Hazardous Event	Possible Outcome (Hazards)	Existing Control Measures	Likelihood	Consequence	Risk Value	CCP?
								☐ *Yes – Additional CCP identified for facility* ☒ *No – no control available at this point; therefore not a CCP*
Storage	*2,6,7,8*	Vandalism/Terrorism	Unsafe drinking water	Alarmed for operator response, doors are alarmed, barbed wire fencing on top of 5ft fence.	X	X	X	☒ *Yes – Mandatory CCP* ☐ *Yes – Additional CCP identified for facility* ☐ *No – no control available at this point; therefore not a CCP*
Storage	*2,3,6,7,8*	Power Outage	Loss of supply	UPS back up for 20 to 30 minutes, generator as back up	*2*	*3*	*6*	☐ *Yes – Mandatory CCP* ☐ *Yes – Additional CCP identified for facility* ☒ *No – no control available at this point; therefore not a CCP*
Storage	*2,5,6,7,8*	Bacteriological samples outside legislative requirements	unsafe drinking water	Weekly sampling for biological hazards.	X	X	X	☒ *Yes – Mandatory CCP* ☐ *Yes – Additional CCP identified for facility* ☐ *No – no control available at this point; therefore not a CCP*
Storage	*2,7,8,10*	Low Residual Cl2,	unsafe drinking water	Sampling of Cl_2 in tower, daily testing in distribution system, distribution Cl_2 analyzers	*3*	*3*	*9*	☐ *Yes – Mandatory CCP*

SUMMARY OF RISK ASSESSMENT OUTCOMES

Reviewed by: PCT | Approved by: Senior Operations Manger

Activity/ Process Step	MOECC Potential Hazardous Event/Hazard Reference # (see Table 4)	Description of Hazardous Event	Possible Outcome (Hazards)	Existing Control Measures	Likelihood	Consequence	Risk Value	CCP?
								☐ *Yes – Additional CCP identified for facility* ☒ *No – no control available at this point; therefore not a CCP*
Storage	*1,2,3,4,7,8*	Road Maintenance, wash outs, Ice storm	Limited access for repairs, maintenance & sampling	Continual maintenance and winter road control provided by contractor. Visual checks by operator.	*1*	*1*	*1*	☐ *Yes – Mandatory CCP* ☐ *Yes – Additional CCP identified for facility* ☒ *No – no control available at this point; therefore not a CCP*
Distribution	*2,3,6,7,8*	Vandalism/Terrorism	Unsafe drinking water	Sampling requirements as per legislation, participate in DWSP	X	X	X	☒ *Yes – Mandatory CCP* ☐ *Yes – Additional CCP identified for facility* ☐ *No – no control available at this point; therefore not a CCP*
Distribution	*2*	Low Cl2 residual, dead ends	Unsafe drinking water	Flushing program for dead ends, daily distribution Cl_2 sampling, distribution Cl_2 analyzers	*3*	*3*	*9*	☐ *Yes – Mandatory CCP* ☐ *Yes – Additional CCP identified for facility* ☒ *No – no control available at this point; therefore not a CCP*

SUMMARY OF RISK ASSESSMENT OUTCOMES

Reviewed by: PCT | Approved by: Senior Operations Manger

Activity/ Process Step	MOECC Potential Hazardous Event/Hazard Reference # (see Table 4)	Description of Hazardous Event	Possible Outcome (Hazards)	Existing Control Measures	Likelihood	Consequence	Risk Value	CCP?
Distribution	*2,7,8*	Low pressure, back siphonage, caused by main breaks, high flows, fire fighting	Unsafe drinking water	All new construction have back flow preventers installed, industries have back flow preventers in place	X	X	X	☒ *Yes – Mandatory CCP* ☐ *Yes – Additional CCP identified for facility* ☐ *No – no control available at this point; therefore not a CCP*
Distribution	*2,7,8*	Water Main Breaks	Loss of supply	Operator emergency contact, contractors on the Essential Supplies & Services List for fast response, low pressure alarm	*5*	*3*	*15*	☒ *Yes – Mandatory CCP* ☐ *Yes – Additional CCP identified for facility* ☐ *No – no control available at this point; therefore not a CCP*
Distribution	*2,7,8*	Main trunk line breaks without maintaining pressure	Loss of supply	Regular sampling, low pressure alarm	*3*	*3*	*9*	☐ *Yes – Mandatory CCP* ☐ *Yes – Additional CCP identified for facility* ☒ *No – no control available at this point; therefore not a CCP*
Distribution	*2,5,6,7*	Chemical contamination, through gas station, seepage through water main, only PVC pipes	unsafe drinking water	Regular treated sampling	*1*	*4*	*4*	☐ *Yes – Mandatory CCP* ☐ *Yes – Additional CCP identified for facility* ☒ *No – no control available at this point; therefore not a CCP*

SUMMARY OF RISK ASSESSMENT OUTCOMES

Reviewed by: PCT | Approved by: Senior Operations Manger

Activity/ Process Step	MOECC Potential Hazardous Event/Hazard Reference # (see Table 4)	Description of Hazardous Event	Possible Outcome (Hazards)	Existing Control Measures	Likelihood	Consequence	Risk Value	CCP?
Distribution	*n/a*	High Pressure in low lying areas	Affecting supply	High pressure alarm	*2*	*3*	*6*	☐ *Yes – Mandatory CCP* ☐ *Yes – Additional CCP identified for facility* ☒ *No – no control available at this point; therefore not a CCP*
Operations	*2,5,6,7,8,9,10*	Operator Error	Unsafe drinking water	Operator training. Alarms. QMS Personnel Coverage Procedure & QMS Competency Procedure	X	X	X	☒ *Yes – Mandatory CCP* ☐ *Yes – Additional CCP identified for facility* ☐ *No – no control available at this point; therefore not a CCP*
Distribution	*1,2,3,4,7*	Frozen Water Services	Loss of Supply	Notify residents of risk, assess each property with frozen service	*3*	*1*	*3*	☐ *Yes – Mandatory CCP* ☐ *Yes – Additional CCP identified for facility* ☒ *No – no control available at this point; therefore not a CCP*
Operations	*2,6,7,8,9,10*	Pandemic, loss of operator	Loss of Supply	Emergency Management can declare state of emergency. Activate OnWARN	*2*	*3*	*6*	☐ *Yes – Mandatory CCP* ☐ *Yes – Additional CCP identified for facility* ☒ *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
Primary Disinfection	Four Alarm Setpoints for Chlorine Residual: LoLo Set 0.20 mg/L (0.25), LoLo Reset 0.25 mg/L (0.30), Lo Set 0.50 mg/L, Lo Reset 0.55 mg/L	CL_2 residual below the calculated set point, the well will shut down and transfer to the other well	Erin Operation & Maintenance Manual Town of Erin WI - Adverse Water Response Procedure
Incoming Source Water	O. Reg 169 exceedances for water quality	DWSP Monitory program in place & Regulatory Sampling Schedule 23 & 24	Town of Erin WI - Adverse Water Response Procedure
Treatment	Hatches and entries are alarmed.	Visual & Customer notifications. All hatches and entries are alarmed.	WI - Vandalism/Terrorism
Storage	Intrusion alarms	Auto-dialer to on-call operator	WI - Vandalism/Terrorism
Storage	O. Reg 169 exceedances for water quality	System can run without tower, additional pumping cost may incur.	WI - Adverse Water Response Procedure
Distribution	Watermain Disinfection Procedure	SCADA trending and public notification	WD Procedure; Watermain Commissioning Form; Watermain repair forms; Low Distribution System Pressure for Watermain Breaks SOP
Distribution	Pressure Gauge in Well houses	Creating a back flow prevention protocol and program, by-law	WI - Adverse Water Response Procedure & WI - Distribution Leak Repair Procedure (if necessary)
Operations	O. Reg 128/04	Dialer calls on-call cell phone. If for some reason the on-call operator does not respond to alarm, the dialer will continue to call the operator's sequence until an answer received. The on-call operator will respond to the alarm as required.	QMS Personnel Coverage Procedure & QMS Competency Procedure

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

SUMMARY OF RISK ASSESSMENT OUTCOMES

Reviewed by: PCT | Approved by: Senior Operations Manger

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
2014-05-21	*Annual Review*	*Frank Smedley (Water Superintendent), Joe Babin (Water Foreman), Sara McDougall (Compliance Administrator/ QMS Rep)*	*Update from DWQMS Rep regarding additional information on frozen water services as a potential risk in next year's Risk Assessment* *Review of Risk Assessment* *Recommendation from Frank and Joe to change Consequences to read Severity so that it matches what is written in the Risk Assessment Procedure.* *Re-ranked some risks and updated existing monitoring and control measures columns*
2015-04-20	*36-Month Risk Assessment*	*Lou Lauryssen (Water Foreperson), Sara McDougall (Compliance Administrator/ QMS Rep), John Wilson (Water Operator)*	*Re-evaluated all potential risks on the 2014 Completed Risk Assessment for Erin and Hillsburgh*
2016-03-09	*Annual Review*	*Joe Babin (Water Superintendent)* *Lou Lauryssen (Water Foreperson), Sara McDougall (Compliance Administrator/ QMS Rep), John Wilson (Water Operator), Geordie Wheeler (Water Operator)*	*Re-evaluated all potential risks on the 2015 Completed Risk Assessment for Erin & Hillsburgh* *Reviewed and updated all columns to reflect any changes over the past year*
2016-09-22	*Review and addition*	*Lou Lauryssen (Water Foreperson), Sara McDougall (Compliance Administrator/ QMS Rep), John Wilson (Water Operator), Geordie Wheeler (Water Operator)*	*Added chemical spills and evaluated the potential risks on the 2016 Risk Assessment*
2017-03-02	*Annual Review*	*Lou Lauryssen (Water Foreperson), Sara McDougall (Compliance Administrator/ QMS Rep), John Wilson (Water Operator), Geordie Wheeler (Water Operator)*	*Re-evaluated all potential risks on the 2016 Completed Risk Assessment for Erin & Hillsburgh* *Reviewed and updated all columns to reflect any changes over the past year*

SUMMARY OF RISK ASSESSMENT OUTCOMES

Reviewed by: PCT	Approved by: Senior Operations Manger

2018-08-02	*36-Month Risk Assessment*	*Don Irvine (PCT), John Wilson (Water Operator), Geordie Wheeler (Water Operator)*	*Reviewed Erin & Hillsburgh Risk Assessment, Added in new table from MOECC Hazardous Events, Converted entire document into DWQMS Version 2.0*
2018-09-28	*Limited Scope Transitional*	*Brigitte Roth*	*Limited Transitional Audit performed for MDWL changes*
2019-08-12	*Annual Review*	*David Jorge (PCT), Geordie Wheeler (Operator)*	*Reviewed Erin Risk Assessment for currency. Additions to Existing Control Measures included: alarms and a chlorine distribution analyzer. Additional corrections to the Hazards - Water Main Breaks, Main Trunk Line Breaks, Chemical Contamination, and High Pressure in Low Lying Areas to better reflect current control measures.*
2020-11-24	*Annual Review*	*Melissa Cortes (PCT), Don Irvine (SOM)*	*Reviewed Erin Risk Assessment for currency. Revised Distribution Existing Control Measures for Gas Station to include treated water sampling and removed well water sampling; Monitoring Procedure for Operations – Dialer calls on-call phone and if not answered continues to call the operator sequence.*
2021-08-12	*36-Month Risk Assessment*	*Don Irvine (SOM), Melissa Cortes (PCT), Geordie Wheeler (Water Operator), Suhail Auzam (Water Operator)*	*Reviewed Erin Risk Assessment, verified currency of table from MOECC Hazardous Events, Re-evaluate all potential risk rating; Risk value for watermains >12 so CCP was added to Table 2*

Table 4: Potential Hazardous Event/Hazard Reference Numbers (based on MECP's "Potential Hazardous Events for Municipal Residential Drinking Water Systems" dated February 2017)

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

SUMMARY OF RISK ASSESSMENT OUTCOMES

Reviewed by: PCT	Approved by: Senior Operations Manger

Revision History

Date	Revision #	Reason for Revision
2018-08-02	0	Procedure issued. (D. Irvine)
2019-08-12	1	Risk Assessment Review Updates (D. Jorge)
2019-09-03	2	Added Table 4: Potential Hazardous Event Reference Numbers Removed Table 2 Item: Repeat Entry for Primary Disinfection Removed CCP – Distribution – Vandalism/Terrorism – No CCP limit set, listed as “n/a” CCPs require a measurement; added to Action Items Table to reassess at the next 36 Month Risk Assessment Removed duplicate CCP for Primary Disinfection Altered CCP Limits for Disinfection alarm setpoints to match current alarm setpoints at the facility Additional clarity to when the 36-Month Risk Assessment was conducted in Table 3
2020-11-24	3	Revised Distribution Existing Control Measures for Gas Station to include treated water sampling and removed well water sampling; Monitoring Procedure for Operations – Dialer calls on-call phone and if not answered continues to call the operator sequence.
2021-08-12	4	36-Month Risk Assessment Review with Management and Operations; Risk value for watermains >12 so CCP was added to Table 2
2021-09-17	5	Updated Table 4 in the Risk Assessment outcomes – removed N/A beside reference number 9 as this is applicable as described in the Risk Assessment

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	MECP Potential Hazardous Event/Hazard Reference # (see Table 4)	Description of Hazardous Event	Possible Outcome (Hazards)	Existing Control Measures	Likelihood	Consequence	Risk Value	CCP?
Disinfection Equipment *Hillsburgh Heights & Glendevon*	*2,6,7,8,10*	Low Residual Cl2, improper disinfection, failure of equipment	Unsafe drinking water	Sample water at beginning of reservoir at beginning of day & continuous CL_2 analyzers. Alarmed	X	X	X	☒ *Yes – Mandatory CCP* ☐ *Yes – Additional CCP identified for facility* ☐ *No – no control available at this point; therefore not a CCP*
Incoming Source Water *Hillsburgh Heights & Glendevon*	*2,5,6,7,9*	Contaminated source water, crack in well casing	Unsafe drinking water	Weekly sampling for biological hazards, & monthly turbidity.	*1*	*4*	*4*	☐ *Yes – Mandatory CCP* ☐ *Yes – Additional CCP identified for facility* ☒ *No – no control available at this point; therefore not a CCP*
Incoming Source Water *Hillsburgh Heights*	*2,5,6,7,9*	Contaminated source water	Unsafe drinking water	Sampling requirements as per legislation, participate in DWSP	X	X	X	☒ *Yes – Mandatory CCP* ☐ *Yes – Additional CCP identified for facility* ☐ *No – no control available at this point; therefore not a CCP*

SUMMARY OF RISK ASSESSMENT OUTCOMES

Reviewed by: PCT | Approved by: Senior Operations Manager

Activity/ Process Step	MECP Potential Hazardous Event/Hazard Reference # (see Table 4)	Description of Hazardous Event	Possible Outcome (Hazards)	Existing Control Measures	Likelihood	Consequence	Risk Value	CCP?
Incoming Source Water *Hillsburgh Heights & Glendevon*	*2,5,6,7,9*	Contaminated source water - Chemical Spill (includes fuel spills)	Unsafe drinking water	Daily Wellhouse Checks & Secondary Containment	*1*	*4*	*4*	☐ *Yes – Mandatory CCP* ☐ *Yes – Additional CCP identified for facility* ☒ *No – no control available at this point; therefore not a CCP*
Incoming Source Water *Hillsburgh Heights & Glendevon*	*1,2,4,7*	Drought	Loss of supply	Water restriction by-law enforced when necessary	*2*	*2*	*4*	☐ *Yes – Mandatory CCP* ☐ *Yes – Additional CCP identified for facility* ☒ *No – no control available at this point; therefore not a CCP*
Primary disinfection *Hillsburgh Heights & Glendevon*	*2,10*	Loss of Chlorine Supply	Unsafe drinking water	Sample water at beginning of reservoir at beginning of day & continuous CL_2 analyzers. Alarmed.	X	X	X	☒ *Yes – Mandatory CCP* ☐ *Yes – Additional CCP identified for facility* ☐ *No – no control available at this point; therefore not a CCP*
Primary disinfection *Hillsburgh Heights & Glendevon*	*2,10*	Poor quality of chlorine	Unsafe drinking water	All Cl_2 is NSF/ANSI 60 approved. Sample water at beginning of reservoir at beginning of day & continuous CL_2 analyzers. Alarmed	X	X	X	☒ *Yes – Mandatory CCP* ☐ *Yes – Additional CCP identified for facility*

SUMMARY OF RISK ASSESSMENT OUTCOMES

Reviewed by: PCT | Approved by: Senior Operations Manager

Activity/ Process Step	MECP Potential Hazardous Event/Hazard Reference # (see Table 4)	Description of Hazardous Event	Possible Outcome (Hazards)	Existing Control Measures	Likelihood	Consequence	Risk Value	CCP?
								☐ *No – no control available at this point; therefore not a CCP*
Reservoir *Hillsburgh Heights*	*2,6,7*	Reservoir Failure	Unsafe drinking water	Low level alarm	*2*	*3*	*6*	☐ *Yes – Mandatory CCP* ☐ *Yes – Additional CCP identified for facility* ☒ *No – no control available at this point; therefore not a CCP*
Reservoir *Glendevon*	*2,6,7*	Reservoir Failure	Unsafe drinking water	Low level alarm	*2*	*2*	*4*	☐ *Yes – Mandatory CCP* ☐ *Yes – Additional CCP identified for facility* ☒ *No – no control available at this point; therefore not a CCP*
Reservoir *Hillsburgh Heights & Glendevon*	*2,6,7,9*	Pests in Reservoir	Unsafe drinking water	Screens placed on all access areas; annual inspections. Pre Cl_2 monitoring.	*1*	*4*	*4*	☐ *Yes – Mandatory CCP* ☐ *Yes – Additional CCP identified for facility* ☒ *No – no control available at this point; therefore not a CCP*
To Distribution	*2,6,7,8*	High Lift Pump failure	Loss of supply		*2*	*4*	*8*	☐ *Yes – Mandatory CCP*

SUMMARY OF RISK ASSESSMENT OUTCOMES

Reviewed by: PCT | Approved by: Senior Operations Manager

Activity/ Process Step	MECP Potential Hazardous Event/Hazard Reference # (see Table 4)	Description of Hazardous Event	Possible Outcome (Hazards)	Existing Control Measures	Likelihood	Consequence	Risk Value	CCP?
Hillsburgh Heights				Monitor hours on pump, Daily inspection (sound change), dialer alarm				☐ *Yes – Additional CCP identified for facility* ☒ *No – no control available at this point; therefore not a CCP*
To Distribution *Glendevon*	*2,6,7,8*	High Lift Pump failure	Loss of supply	Monitor hours on pump, Daily inspection (sound change), dialer alarm	*2*	*3*	*6*	☐ *Yes – Mandatory CCP* ☐ *Yes – Additional CCP identified for facility* ☒ *No – no control available at this point; therefore not a CCP*
Treatment *Glendevon*	*2,7,9,10*	Power Outage	Loss of supply	Portable Stand-by Generator for backup	*4*	*1*	*4*	☐ *Yes – Mandatory CCP* ☐ *Yes – Additional CCP identified for facility* ☒ *No – no control available at this point; therefore not a CCP*
Treatment *Hillsburgh Heights*	*2,7,9,10*	Power Outage	Loss of supply	Hillsburgh Heights has back-up generator to run system	*4*	*2*	*8*	☐ *Yes – Mandatory CCP* ☐ *Yes – Additional CCP identified for facility*

SUMMARY OF RISK ASSESSMENT OUTCOMES

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Activity/ Process Step	MECP Potential Hazardous Event/Hazard Reference # (see Table 4)	Description of Hazardous Event	Possible Outcome (Hazards)	Existing Control Measures	Likelihood	Consequence	Risk Value	CCP?
								☒ *No – no control available at this point; therefore not a CCP*
Treatment *Hillsburgh Heights & Glendevon*	*2,6,7,9,10*	Vandalism/Terrorism	Unsafe drinking water	Alarmed for operator response	X	X	X	☒ *Yes – Mandatory CCP* ☐ *Yes – Additional CCP identified for facility* ☐ *No – no control available at this point; therefore not a CCP*
Treatment *Hillsburgh Heights & Glendevon*	*2,6,7,9,10*	Dialer fails	Loss of alarm/notifications	Alarm testing on Dialer, UPS for power outage & automatic pump shutdown	*2*	*3*	*6*	☐ *Yes – Mandatory CCP* ☐ *Yes – Additional CCP identified for facility* ☒ *No – no control available at this point; therefore not a CCP*
Treatment *Hillsburgh Heights*	*2,3,4,6,7,8,10*	Brown out, low voltage, loss of phase	Loss of supply	Alarms, loss of a phase trigger dialer & low voltage monitor	*3*	*2*	*6*	☐ *Yes – Mandatory CCP* ☐ *Yes – Additional CCP identified for facility* ☒ *No – no control available at this point; therefore not a CCP*

SUMMARY OF RISK ASSESSMENT OUTCOMES

Reviewed by: PCT | Approved by: Senior Operations Manager

Activity/ Process Step	MECP Potential Hazardous Event/Hazard Reference # (see Table 4)	Description of Hazardous Event	Possible Outcome (Hazards)	Existing Control Measures	Likelihood	Consequence	Risk Value	CCP?
Treatment *Glendevon*	*2,3,4,6,7,8,10*	Brown out, low voltage, loss of phase	Loss of supply	Alarms, loss of a phase trigger dialer & low voltage monitor	*3*	*1*	*3*	☐ *Yes – Mandatory CCP* ☐ *Yes – Additional CCP identified for facility* ☒ *No – no control available at this point; therefore not a CCP*
Treatment *Hillsburgh Heights*	*2,3,4,6,7,10*	Well pit flooding	Loss of supply, shuts down systems	High water level float	*2*	*4*	*6*	☐ *Yes – Mandatory CCP* ☐ *Yes – Additional CCP identified for facility* ☒ *No – no control available at this point; therefore not a CCP*
Treatment *Hillsburgh Heights*	*2,3,4,6,7,10*	Sump pump failure	Loss of supply, shuts down systems	Alarmed	*2*	*2*	*4*	☐ *Yes – Mandatory CCP* ☐ *Yes – Additional CCP identified for facility* ☒ *No – no control available at this point; therefore not a CCP*
Treatment, filtration *Hillsburgh Heights*	*2,6,7*	Filtration rupture, Treatment failure	Unsafe drinking water	Monthly Sampling requirements as per legislation, differential pressure indicates a blockage	*2*	*4*	*6*	☐ *Yes – Mandatory CCP* ☐ *Yes – Additional CCP identified for facility*

SUMMARY OF RISK ASSESSMENT OUTCOMES

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Activity/ Process Step	MECP Potential Hazardous Event/Hazard Reference # (see Table 4)	Description of Hazardous Event	Possible Outcome (Hazards)	Existing Control Measures	Likelihood	Consequence	Risk Value	CCP?
								☒ *No – no control available at this point; therefore not a CCP*
Water In-take *Hillsburgh Heights*	*2,6,7*	Well Pump Failure	Loss of supply	Daily inspection, Visual pump fault indication on Bristol screen, dialer alarm	*2*	*4*	*8*	☐ *Yes – Mandatory CCP* ☐ *Yes – Additional CCP identified for facility* ☒ *No – no control available at this point; therefore not a CCP*
Water In-take *Glendevon*	*2,6,7*	Well Pump Failure	Loss of supply	Daily inspection, Visual pump fault indication on Bristol screen, dialer alarm	*2*	*2*	*4*	☐ *Yes – Mandatory CCP* ☐ *Yes – Additional CCP identified for facility* ☒ *No – no control available at this point; therefore not a CCP*
Distribution	*2,6,7,8*	Vandalism/Terrorism	Unsafe drinking water	Sampling requirements as per legislation, participate in DWSP	X	X	X	☒ *Yes – Mandatory CCP* ☐ *Yes – Additional CCP identified for facility* ☐ *No – no control available at this point; therefore not a CCP*

SUMMARY OF RISK ASSESSMENT OUTCOMES

Reviewed by: PCT | Approved by: Senior Operations Manager

Activity/ Process Step	MECP Potential Hazardous Event/Hazard Reference # (see Table 4)	Description of Hazardous Event	Possible Outcome (Hazards)	Existing Control Measures	Likelihood	Consequence	Risk Value	CCP?
Distribution	*2*	Low Cl2 residual, dead ends	Unsafe drinking water	Flushing program for dead ends, daily distribution Cl_2 sampling, distribution analyzers	*3*	*3*	*9*	☐ *Yes – Mandatory CCP* ☐ *Yes – Additional CCP identified for facility* ☒ *No – no control available at this point; therefore not a CCP*
Distribution	*2,7,8*	Low pressure, back siphonage, caused by main breaks, high flows, fire fighting	Unsafe drinking water	All new construction has back flow preventers installed.	X	X	X	☒ *Yes – Mandatory CCP* ☐ *Yes – Additional CCP identified for facility* ☐ *No – no control available at this point; therefore not a CCP*
Distribution	*2,7,8*	Water Main Breaks	Loss of supply	Infrastructure rehabilitation is scheduled to coincide with road repair/upgrades, replacing ductile iron or cast iron mains. Visual & audible inspection for leaks, pressure monitoring, unaccountable water	*5*	*3*	*15*	☐ *Yes – Mandatory CCP* ☐ *Yes – Additional CCP identified for facility* ☒ *No – no control available at this point; therefore not a CCP*
Distribution	*N/A*	High Pressure in low lying areas	Affecting supply	Pressure relief valves, visual check of gauges, maintenance schedule	*3*	*2*	*6*	☐ *Yes – Mandatory CCP* ☐ *Yes – Additional CCP identified for facility*

SUMMARY OF RISK ASSESSMENT OUTCOMES

Reviewed by: PCT | Approved by: Senior Operations Manager

Activity/ Process Step	MECP Potential Hazardous Event/Hazard Reference # (see Table 4)	Description of Hazardous Event	Possible Outcome (Hazards)	Existing Control Measures	Likelihood	Consequence	Risk Value	CCP?
								☒ *No – no control available at this point; therefore not a CCP*
Operations	*2,5,6,7,8,9,10*	Operator Error	Unsafe drinking water	Operator training. Alarms. QMS Personnel Coverage Procedure & QMS Competency Procedure	X	X	X	☒ *Yes – Mandatory CCP* ☐ *Yes – Additional CCP identified for facility* ☐ *No – no control available at this point; therefore not a CCP*
Distribution	*1,2,3,4,7*	Frozen Water Services	Loss of supply	Notify residents of risk, assess each property with frozen service	*3*	*1*	*3*	☐ *Yes – Mandatory CCP* ☐ *Yes – Additional CCP identified for facility* ☒ *No – no control available at this point; therefore not a CCP*
Operations	*2,6,7,8,9,10*	Pandemic, loss of operator	Loss of supply	Emergency Management can declare state of emergency. Activate OnWARN	*2*	*3*	*6*	☐ *Yes – Mandatory CCP* ☐ *Yes – Additional CCP identified for facility* ☒ *No – no control available at this point; therefore not a CCP*
Distribution Frank Smedley BS	*1,2,6,7,10*	Flood	Low Pressure	Flood Alarm Installed	*2*	*1*	*2*	☐ *Yes – Mandatory CCP*

SUMMARY OF RISK ASSESSMENT OUTCOMES

Reviewed by: PCT | Approved by: Senior Operations Manager

Activity/ Process Step	MECP Potential Hazardous Event/Hazard Reference # (see Table 4)	Description of Hazardous Event	Possible Outcome (Hazards)	Existing Control Measures	Likelihood	Consequence	Risk Value	CCP?
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Table 2: Identified Critical Control Points (CCPs)

CCP	Critical Control Limits	Monitoring Procedures	Response, Reporting and Recording Procedures
Primary disinfection	Four Alarm Setpoints for Chlorine Residual: LoLo Set 0.20 mg/L, LoLo Reset 0.25 mg/L, Lo Set 0.50 mg/L, Lo Reset 0.55 mg/L	CL_2 residual below the calculated setpoint, the well will automatically shut down	Hillsburgh Operation & Maintenance Manual Town of Erin WI - Adverse Water Response Procedure
Incoming Source Water	O. Reg 169 exceedances for water quality	Naturally occurring lead, low levels of radionuclides. Additional sampling performed as per Drinking Water Works Permit & License. Filtration system for lead in place @ Hillsburgh Heights Wellhouse	Town of Erin WI - Adverse Water Response Procedure
Treatment	hatches & entries are alarmed	Visual & Customer notifications. All hatches and entry points are alarmed	WI - Vandalism/Terrorism
Distribution	Pressure Gauge in Wellhouse	Creating a back flow prevention protocol and program, by-law	WI - Adverse Sample Response Procedure & WI - Distribution Leak Repair Procedure (if necessary)
Distribution	Water Disinfection Procedure	SCADA trending and public notification	WD Procedure; Watermain Commissioning Form; Watermain repair forms; Low Distribution System Pressure for Watermain Breaks SOP

Operations	O. Reg 128/04	Dialer calls on-call cell phone. If for some reason the on-call operator does not respond to alarm, the dialer will continue to call the operator's sequence until an answer received. The on-call operator will respond to the alarm as required.	QMS Personnel Coverage Procedure & QMS Competency Procedure

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
2014-05-21	*Annual Review*	*Frank Smedley (Water Superintendent), Joe Babin (Water Foreman), Sara McDougall (Compliance Administrator/ QMS Rep)*	*Update from DWQMS Rep regarding additional information on frozen water services as a potential risk in next year's Risk Assessment* *Review of Risk Assessment* *Recommendation from Frank and Joe to change Consequences to read Severity so that it matches what is written in the Risk Assessment Procedure.* *Re-ranked some risks and updated existing monitoring and control measures columns*
2015-04-20	*36-Month Risk Assessment*	*Lou Lauryssen (Water Foreperson), Sara McDougall (Compliance Administrator/ QMS Rep), John Wilson (Water Operator)*	*Re-evaluated all potential risks on the 2014 Completed Risk Assessment for Erin and Hillsburgh*
2016-03-09	*Annual Review*	*Joe Babin (Water Superintendent)* *Lou Lauryssen (Water Foreperson), Sara McDougall (Compliance Administrator/ QMS Rep), John Wilson (Water*	*Re-evaluated all potential risks on the 2015 Completed Risk Assessment for Erin & Hillsburgh* *Reviewed and updated all columns to reflect any changes over the past year*

SUMMARY OF RISK ASSESSMENT OUTCOMES

Reviewed by: PCT | Approved by: Senior Operations Manager

		Operator), Geordie Wheeler (Water Operator)	
2016-09-22	*Review and addition*	*Lou Lauryssen (Water Foreperson), Sara McDougall (Compliance Administrator/ QMS Rep), John Wilson (Water Operator), Geordie Wheeler (Water Operator)*	*Added chemical spills and evaluated the potential risks on the 2016 Risk Assessment*
2017-03-02	*Annual Review*	*Lou Lauryssen (Water Foreperson), Sara McDougall (Compliance Administrator/ QMS Rep), John Wilson (Water Operator), Geordie Wheeler (Water Operator)*	*Re-evaluated all potential risks on the 2016 Completed Risk Assessment for Erin & Hillsburgh* *Reviewed and updated all columns to reflect any changes over the past year*
2018-08-02	*36-Month Risk Assessment*	*Don Irvine (PCT), John Wilson (Water Operator), Geordie Wheeler (Water Operator)*	*Reviewed Erin & Hillsburgh Risk Assessment, Added in new table from MOECC Hazardous Events, Converted entire document into DWQMS Version 2.0*
2018-09-28	*Limited Scope Transitional*	*Brigitte Roth*	*Limited Transitional Audit performed for MDWL changes*
2019-08-12	*Annual Review*	*David Jorge (PCT), Geordie Wheeler (Operator)*	*Reviewed Hillsburgh Risk Assessment for currency. Additions to Existing Control Measures included: alarms and a chlorine distribution analyzer.*
2020-11-24	*Annual Review*	*Melissa Cortes (PCT), Don Irvine (SOM)*	*Reviewed Hillsburgh Risk Assessment for currency. Revised Table 2 Operations Monitoring Procedures to dialer calls on-call operator, if no answer dialer continues to call operator sequence*
2021-08-12	*36-Month Risk Assessment*	*Don Irvine (SOM), Melissa Cortes (PCT), Geordie Wheeler (Water Operator), Suhail Auzam (Water Operator)*	*Reviewed Erin Risk Assessment, verified currency of table from MOECC Hazardous Events, Re-evaluate all potential risk rating; Risk value for watermains >12 so CCP was added to Table 2*

Table 4: Potential Hazardous Event/Hazard Reference Numbers (based on MECP's "Potential Hazardous Events for Municipal Residential Drinking Water Systems" dated February 2017)

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

SUMMARY OF RISK ASSESSMENT OUTCOMES

Reviewed by: PCT | Approved by: Senior Operations Manager

Revision History

Date	Revision #	Reason for Revision
2018-08-02	0	Procedure issued. (D. Irvine)
2019-08-12	1	Risk Assessment Review Updates (D.Jorge)
2019-09-03	2	Added Table 4: Potential Hazardous Event Reference Numbers Removed Table 2 Item: Repeat Entry for Primary Disinfection Removed CCP – Distribution – Vandalism/Terrorism – No CCP limit set, listed as “n/a”. CCPs require a measurement; added to Action Items Table to reassess at the next 36 Month Risk Assessment. Removed duplicate CCP for Primary Disinfection Altered CCP Limits for Disinfection alarm setpoints to match current alarm setpoints at the facility Additional clarity to when the 36-Month Risk Assessment was conducted in Table 3
2020-11-24	3	Revised Table 2 Operations Monitoring Procedures to dialer calls on-call operator, if no answer dialer continues to call operator sequence
2021-08-12	4	36-Month Risk Assessment review with Manager and Operations; Risk value for watermains >12 so CCP was added to Table 2
2021-09-17	5	Updated Table 4 in the Risk Assessment outcomes – removed N/A beside reference number 9 as this is applicable as described in the Risk Assessment

ORGANIZATIONAL STRUCTURE, ROLES, RESPONSIBILITIES AND AUTHORITIES

Reviewed by: PCT	Approved by: Senior Operations Manager

1. Purpose

To document the following for the Town of Erin DWS:

- 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 Senior Operations Manager and/or Operations Manager (or designate) 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 Town of Erin DWS are owned by The Corporation of The Town of Erin and are represented by Council, Mayor, CAO, and Director of Finance.

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

3.2 Top Management

Top Management for the Town of Erin DWS consists of:

- Operations Management – Highlands
- Regional Hub Manager – Georgian Highlands
- Safety, Process & Compliance Manager – Georgian Highlands

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 MOECC 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 Highlands Hub

Role	Responsibilities and Authorities
Owner	• Understanding duty, liability, and standards of care outlined in the "Taking Care of Your Drinking Water: A Guide for Members of Municipal Councils" guide provided by the Government of Ontario • Approval of financial plans and budgets • Operational Plan endorsement • Provides Public access to Annual, Summary Reports and the Operational Plan • Provide the Operating Authority information as requested • Relay any MECP communications, requirements, and documentation to the Operating Authority • Coordinate with the Operating Authority as needed
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 • Manages 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

ORGANIZATIONAL STRUCTURE, ROLES, RESPONSIBILITIES AND AUTHORITIES

Reviewed by: PCT | Approved by: Senior Operations Manager

Role	Responsibilities and Authorities
Operations Management (Top Management)	• Manage the day-to-day operations and maintenance of his/her assigned facilities and supervise facility operational staff • Fulfill role of Top Management • Ensure corporate and site-specific QEMS programs and procedures are implemented at his/her assigned facilities • Determine necessary action and assign resources in response to operational issues • 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.
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 his/her Regional Hub and any need for improvement • Act as alternate QEMS Representative (when required)
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 his/her assigned facilities • Fulfill role of QEMS Representative (OP-04) • Monitor, evaluate and report on compliance/quality status of his/her assigned facilities • Implement facility-specific QEMS programs and procedures consistently at his/her 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/cluster/facility level (in consultation with the Operations Management as required)

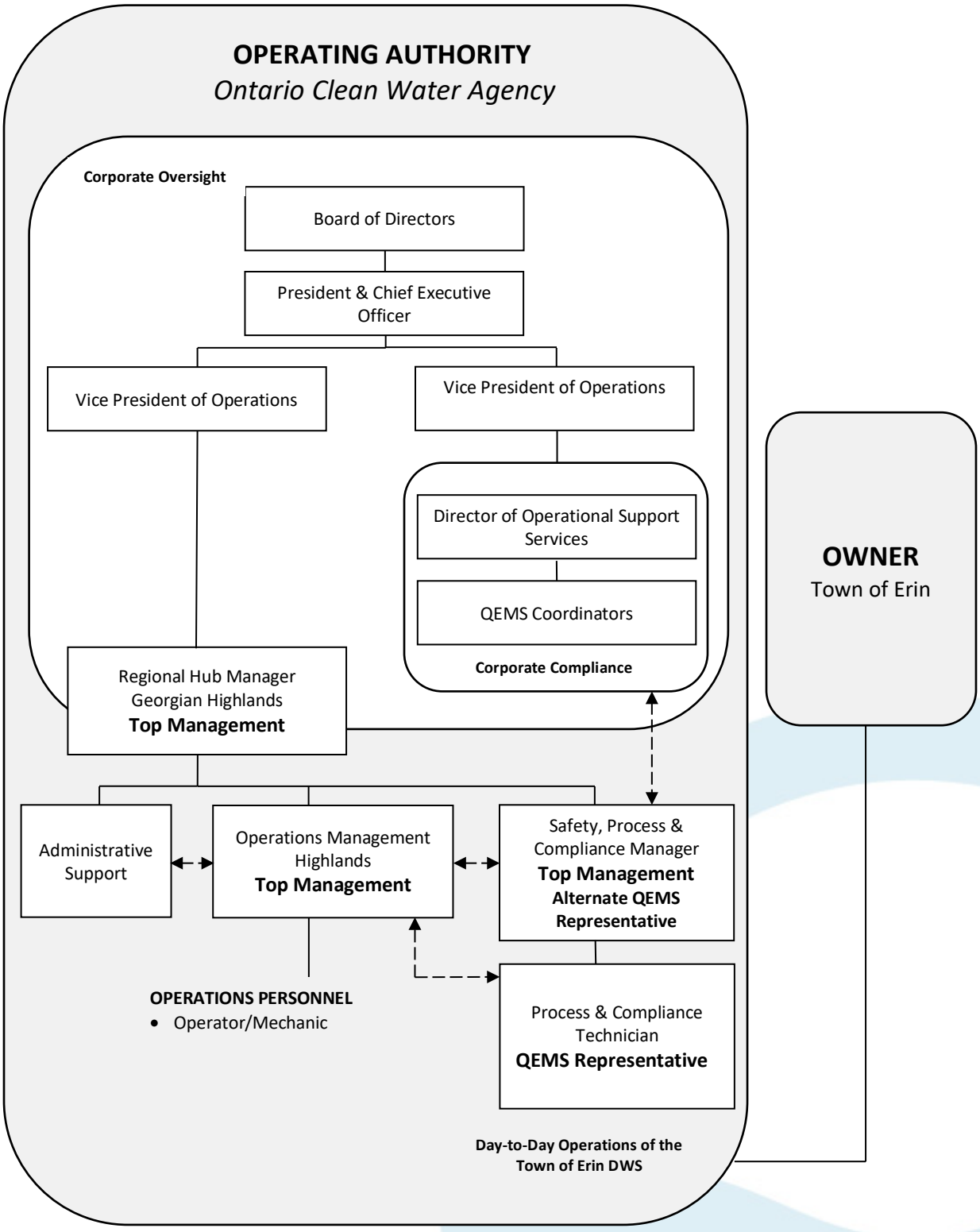
Role	Responsibilities and Authorities
	• Communicates to Owners on facility compliance and DWQMS accreditation as directed • Deliver/participate in/coordinate training including applicable legislative and regulatory requirements and the QEMS • May act as Operator-in-Charge (OIC) and/or Overall Responsible Operator (ORO) when required.
Operator/Mechanic	• Perform duties as assigned by Operations Management or designate • 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 • Participate in facility inspections and audits • May act as Operator-in-Charge (OIC) and/or Overall Responsible Operator (ORO) when required.
Operational and Maintenance (O&M) Team Lead	• Perform duties as assigned by Operations Management • Oversee maintenance activities on equipment and process in order to maintain compliance with applicable legislation, regulations, approvals and established operating procedures • Prepare and/or coordinate staff work assignments and follow up to ensure completion • Act for management during vacations or periodic absences. • Develop and provide O&M reports to management and recommend changes in operating procedures/processes to improve facility operations • Assist with facility operations including monitoring facility processes, reviewing process data and trouble-shooting • Assist management in developing annual O&M budgets and provide recommendations relating to potential O&M expenditures • May act as Operator-in-Charge (OIC) and/or Overall Responsible Operator (ORO) when required.
Administrative Assistant/Project Clerk	• 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

5. Revision History

Date	Revision #	Reason for Revision
2018-09-21	0	Procedure issued – Information within OP-09 was originally set out in the main body of OCWA's Operational Plan (last revision 7 dated 2017-09-25). New Purpose, Definitions, Procedure, Related Documents and separate Revision History sections. Added definitions for Operations Management and Operations Personnel and throughout procedure replaced 'Senior Operations Manager' references with 'Operations Management'. Incorporated OCWA's new org structure, including SPC Manager. Removed two levels of Top Management (e.g. Facility Level and Corporate level), instead Top Management is only at the facility level and corporate has been moved to Corporate oversight. Re-worded QEMS Roles, Responsibilities and Authorities for each position. Added QEMS Roles, Responsibilities and Authorities for Administrative Assistant/Project Clerk.
2019-08-16	1	Addressed OFI from previous (2018) external audit – the addition of the Owner to the Roles and Responsibilities table.
2020-09-02	2	Removal of Roles and Responsibilities for Mechanic/Operator, Instrumentation Technician from the Roles and Responsibilities table as they are not roles reflected in the Highlands Hub


OPERATING AUTHORITY
Ontario Clean Water Agency
Corporate Oversight
Board of Directors
President & Chief Executive Officer
Vice President of Operations
Vice President of Operations
Director of Operational Support Services
QEMS Coordinators
Corporate Compliance
Regional Hub Manager Georgian Highlands
Top Management
OWNER
Town of Erin
Administrative Support
Operations Management Highlands
Top Management
Safety, Process & Compliance Manager
Top Management
Alternate QEMS Representative
OPERATIONS PERSONNEL
• Operator/Mechanic
Process & Compliance Technician
QEMS Representative
Day-to-Day Operations of the Town of Erin DWS

Revision History

Date	Revision #	Reason for Revision
2018-08-02	0	Procedure issued. (D. Irvine)
2020-07-29	1	Revision to reflect change to reporting structure - Corporate Compliance now reports to VP of Operations.

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.

Position	Required Minimum Competencies
Operations Management	• Valid operator certification; minimum OIT or minimum level WD Class III, if required to act as ORO • 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

Position	Required Minimum Competencies
Safety, Process & Compliance (SPC) Manager	• Valid operator certification • 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
Operator/Mechanic	• Valid operator certification; minimum OIT or minimum level of WD Class III, if required to act as ORO • 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
Process & Compliance Technician, Operations and Compliance Team Lead	• Valid operator certification; if required • 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
O&M Team Lead	• Valid operator certification; minimum OIT or minimum WD Class III if required to act as OIC and/or ORO • One of: Electrical/Electronic/Instrumentation Technician or Technologist Diploma; Mechanical Millwright; Certified Engineering Technician/Technologist designation, or; a valid Engineering or Environmental Technician diploma

Position	Required Minimum Competencies
	• Experience and/or training in managing and planning multiple projects, assessing priorities and effectively coordinating operation and maintenance programs • Training and/or experience related to operations and maintenance of 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

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

Position	Required Minimum Competencies
Administrative Assistant/Project Clerk	• 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 is 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 mandatory environmental and health and safety compliance training listed in OCWA's Mandatory Compliance Training Requirements document, based on their position and/or the duties they perform. This list is available on OCWA's intranet.

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 Training Department. Training records maintained at the facility are controlled as per OP-05 Document and Records Control.

4. Related Documents

OCWA's Training Resources (OCWA Intranet)
Orientation checklists/documentation
OCWA's Mandatory Compliance Training list (OCWA intranet)
Performance Planning and Review Database
OP-5 Document and Records Control
OCWA Training Summary Database

5. Revision History

Date	Revision #	Reason for Revision
2018-09-21	0	Procedure issued – Information within OP-10 was originally set out in the main body of OCWA's Operational Plan (last revision 7 dated 2018-09-25). New Purpose, Definitions, Procedure, Related Documents and separate Revision History sections. Added definitions for Operations Management and Operations Personnel and throughout procedure replaced 'Senior Operations Manager' references with 'Operations Management'. Modified table in procedure (s. 3.1 and s. 3.2): removed/revised non-measurable competencies, added the word 'minimum' to competencies; removed 'Valid Class G Driver's License' listed under individual positions and referenced in s. 3.11; added competencies for SPC Managers and Admin Assistants and merged competencies for Senior Operations Manager and Operations Manager under Operations Management. Updated training sections (s. 3.4 to s. 3.7) to reference new Environmental 101 course, Mandatory Compliance Training list and removed specific references to Orientation Training Program. Added s. 3.11 related to ensuring operators make Operations Management aware of changes to operator certification and other certificates/licenses. Other minor changes to wording.
2020-09-02	1	Removal of Roles and Responsibilities for Senior Operator/Mechanic , Mechanic/Operator, Instrumentation Technician and Maintenance Electrician/Operator from the Roles and Responsibilities table as they are not roles reflected in the Highlands Hub

PERSONNEL COVERAGE

Reviewed by: PCT	Approved by: Senior Operations Manager

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 Town of Erin DWS.

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 Town of Erin DWS are staffed by OCWA personnel as follows:

From 7:30 a.m. to 4:00 p.m. Monday to Friday by 2 staff members with a third available when needed. There is a staff member on-call 24 hours a day, 7 days a week.

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

Refer to the ORO Posting document (location of this document can be found in OP-05A) for the person acting as designated overall responsible operator (ORO). When the designated ORO is unavailable, the person designated as the back-up ORO acts as the ORO. This information 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 Friday. The on-call schedule is maintained by the Senior Operator and consists of a 3-week rotation, is set on a quarterly basis and posted in the administration office.

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

3.5 The on-call operator conducts a physical inspection of the facility at least once on Statutory Holiday weekends for the required 72-hour checks. 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. 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-In Report form.

3.7 Each manager (e.g. Operations Management/SPC Manager) 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-In Reports
Shift/Vacation Schedule
Critical Shortage of Staff Contingency Plan (Facility Emergency Plan)

5. Revision History

Date	Revision #	Reason for Revision

PERSONNEL COVERAGE

Reviewed by: PCT	Approved by: Senior Operations Manager

2018-09-21	0	Procedure issued following new template from Corporate Compliance. QP-04 procedure renamed OP-12. Removed Scope and Responsibilities sections. Added definitions for Operations Management and Operations Personnel. Reordered and created separate sections to clarify communications to each of the 4 parties. Clarified suppliers were those listed as essential as per Element 13 (as per DWQMS v. 2.0) and replaced references to Senior Operations Manager with 'Operations Management'. Updated training sections for OCWA personnel (s. 3.3.1 to s. 3.3.4) to reference new Environmental Compliance 101 course completed within first year of hire and to outline how training is coordinated between SPC Manager/Operations Management, and QEMS Representative. Included sections on R&Rs for performance reporting within OCWA (s. 3.3.7 to s. 3.3.9) and to Client (3.4.1). Replaced identification of media spokesperson (s. 3.6.1) with 'as identified in Facility Emergency Plan'. Added reference to site-specific records/documents used for recording tours (s. 3.6.3). Other minor edits.
2019-09-03	1	Revised Section 3.5 – Regular Weekend Physical Inspections are no longer conducted by the Operations Staff.

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 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 (EC101) 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 Regional Hub Manager, Operations Management, SPC Manager 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/PCT 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 enquiries.

3.6.2 OCWA's QEMS and QEMS Policy are communicated to the public through OCWA's public website. The QEMS Policy is also posted at The Town of Erin Drinking Water Systems, and the Highlands Hub office.

3.6.3 Facility tours of 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 in the WMS database. 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
Emergency Response Plan
OPEX Incident Reports

5. Revision History

COMMUNICATIONS

Reviewed by: PCT	Approved by: Senior Operations Manager

Date	Revision #	Reason for Revision
2018-09-21	0	Procedure issues following new template from Corporate Compliance. QP-04 procedure renamed OP-12. Removed Scope and Responsibilities sections. Added definitions for Operations Management and Operations Personnel. Reordered and created separate sections to clarify communications to each of the 4 parties. Clarified suppliers were those listed as essential as per Element 13 (as per DWQMS v. 2.0) and replaced references to Senior Operations Manager with 'Operations Management'. Updated training sections for OCWA personnel (s. 3.3.1 to s. 3.3.4) to reference new Environmental Compliance 101 course completed within first year of hire and to outline how training is coordinated between SPC Manager/Operations Management, and QEMS Representative. Included sections on R&Rs for performance reporting within OCWA (s. 3.3.7 to s. 3.3.9) and to Client (3.4.1). Replaced identification of media spokesperson (s. 3.6.1) with 'as identified in Facility Emergency Plan'. Added reference to site-specific records/documents used for recording tours (s. 3.6.3). Other minor edits.
2019-09-04	1	3.6.3 – Description altered to remove duplicate complaint procedures documented in 3.6.4
2020-09-02	2	3.6.4 – Updated to reflect that all complaints are documented in WMS database

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 Town of Erin DWS are contained in the 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 of Environment, Conservation and Parks (MECP) has an agreement with The Canadian Association for Laboratory Accreditation (CALA) for accreditation of laboratories testing drinking water. The QEMS Representative is responsible for notifying the MECP 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. flowmeters) 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 A non- ANSI/NSF certified chemical, Ferric Chloride, is used in the Hillsburgh System for the removal of lead via coagulation. This chemical is added to the raw water and removed immediately after with ANSI/NSF certified lead filtration media.

3.10 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.

3.11 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
2018-09-21	5	Procedure updated following new template from Corporate Compliance. QP-05 procedure renamed OP-13. Removed Scope and Responsibilities sections. Changes to wording to provide clarification on ensuring quality of essential supplies and services (s. 3.5, 3.6, 3.7 and 3.9)

ESSENTIAL SUPPLIES AND SERVICES

Reviewed by: PCT	Approved by: Senior Operations Manager

2019-11-03	1	Added Section 3.9 for Ferric Chloride usage.

REVIEW AND PROVISION OF INFRASTRUCTURE

Reviewed by: PCT	Approved by: Senior Operations Manager

1. Purpose

To describe OCWA's procedure for reviewing the adequacy of infrastructure necessary to operate and maintain the Town of Erin DWS.

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 operations personnel PCT or duty operator 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
- MECP Inspection Reports

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
2018-09-21	0	Procedure updated following new template from Corporate Compliance. QP-06 procedure renamed OP-14. Removed Scope and Responsibilities sections. Replaced 'once every 12 months' with 'once every calendar year' (s. 3.1) to reflect wording in DWQMS v. 2.0. Added s. 3.2 to consider the outcomes of the risk assessment under Element 8 during the review to reflect wording in DWQMS v. 2.0. Changes to wording to provide clarification on who is required to attend the review and what documents and records may be considered during the review (s. 3.1). Linked the procedure with OP-15 in terms of documenting a long-term forecast (s. 3.3 and s. 3.4).

1. Purpose

To describe OCWA's infrastructure maintenance, rehabilitation and renewal program for the Town of Erin DWS

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, backup diesel operation, weekly inspection of facility, etc.

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 WMS Primary, Operations Management and/or Mechanic/Operator maintain the inventory of equipment in WMS and ensure 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 Works Spreadsheet 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 operations personnel (e.g. Senior Operator, O&M Team Lead, etc.) 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, the WMS is set up so the Operations Manager can track the Highlands Hub Work Order Status by using the start centre for review of w/o completion rate. This tracks corrective,

preventative, weekly, capital and operational work orders as to the number scheduled, closed or in progress of closing for all of the facilities including the Town of Erin Well Supply System. The total number of labour hours and total costs of each group of work orders are also monitored. The completion rate of all work orders is monitored as to the percentage closed and percent variance.

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 at a minimum of at least once every calendar year through submission of the Capital Works Spreadsheet 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
2018-09-21	0	Procedure issued – Information within OP-15 was originally set out in the Main body of OCWA's Operational Plan (last revision 7 dated 2017-09-25). New Purpose, Definitions, Procedure, Related Documents and separate Revision History sections. Added the requirement to ensure the long term forecast is reviewed at once every calendar year and to document a long term forecast (s. 3.1.3) to reflect in DWQMS v. 2.0. Minor wording updates to reflect OCWA's current WMS.
2020-09-02	1	Update section 3.1.4 Program Monitoring and Reporting – WMS is set up so Operations Manager can track Highlands Hub Work Order Status

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, the facility's Municipal Drinking Water License (MDWL) as well as sampling/testing and monitoring requirements listed within the service agreement with the Owner, MECP orders/inspection reports (as applicable).

3.2 Sampling requirements for the facility are defined in the facility's sampling schedule which is available to operations personnel, at the location(s) s in OP-05 Document and Records Control. The sampling schedule is maintained by the PCT 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.

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, including online treated and distribution chlorine analyzers, are 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:

- Well Level
- Raw Water Flow
- Treated Water Flow
- Well Pump Run Hours

- High Lift Pump Run Hours

3.5 Adverse water quality incidents are responded to and reported as per SOP – 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 the location for the schedule for in-house process control checks (Round Sheets) and sampling schedule can be found in the locations specified in OP-05A

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

3.7 Additional sampling, testing and monitoring activities related to the facility's/ system's most challenging conditions are applicable for the Town of Erin DWS's. There is naturally occurring lead and low levels of radionuclides at the Hillsburgh Heights Well Supply. Additional sampling is performed as per the Municipal Drinking Water Licence. At Hillsburgh Heights Well Supply and Treatment lead is sampled quarterly and radionuclides are sampled every 36 months.

3.8 There are no relevant upstream sampling, testing and monitoring activities that take place for the Town of Erin DWS's.

3.9 Sampling, testing and monitoring results are readily accessible to the Owner at the Hub Office.

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 service 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)

Emergency Contact List and Essential Supplies & Services List
Facility Emergency Plan (FEP) Binder
SOP - Reporting and Responding to Adverse Results (FEP Binder)
Operational Check Sheets/Data Collection Sheet
Sampling Plan/Calendar/Schedule
SCADA Records

5. Revision History

Date	Revision #	Reason for Revision
2018-09-21	0	Procedure updated following new template from Corporate Compliance. QP-07 procedure renamed OP-16. Removed Scope and Responsibilities sections. Updated s. 3.1 to reference Municipal Drinking Water License and s. 3.2 to reference sampling calendar/plan and removed sampling table. Expanded information related to accredited and licensed laboratories (s. 3.3). Reordered some sections and other minor edits.
2019-09-03	1	Revised 3.4 – Included current online analyzers used for continuous monitoring
2020-09-04	2	Revised 3.7 – Additional sampling, testing and monitoring activities related to system's most challenging conditions is applicable

MEASUREMENT AND RECORDING EQUIPMENT CALIBRATION AND MAINTENANCE

Reviewed by: PCT	Approved by: Senior Operations Manager

1. Purpose

To describe the procedure for the calibration and/or verification and maintenance of measurement and recording equipment at the Town of Erin DWS's.

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 PCT establishes and maintains a list of measurement and recording devices and associated calibration and/or verification schedules using PCT on line calendar. 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).

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

3.4 Calibration and maintenance activities are carried out in accordance with procedures specified in the manufacturer's manual, or 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 and the PCT 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. The Operations Management and PCT or designate 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
2018-09-21	0	Procedure updated following new template from Corporate Compliance. QP-08 procedure renamed OP-17. Removed Scope and Responsibilities sections. Added s. 3.3 to clarify how calibration and/or verification activities are documented. Added s. 3.5 to include how standards, reagents and/or chemicals are verified before use to ensure they are not expired. Other minor edits.

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

Emergency Response Plan (ERP) – 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 Senior Operations Manager or designate 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-level Emergency Response Plan (ERP) 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 Operations Management, Safety, Process and Compliance Manager and the 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 corporate ERP. Level 3 events usually

involve intervention from outside organizations (client, emergency responders, Ministry of the Environment, Conservation, and Parks, 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 Town of Erin DWS's 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 situation/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 situation 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 ERP.

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
2018-09-21	0	Procedure updated following new template from Corporate Compliance. QP-09 procedure renamed OP-18. Removed Scope and Responsibilities sections and reordered some sections. Added definition 'Operations Management'. Throughout procedure replaced 'Senior Operations Manager' references with 'Operations Management'. Removed references to 'OCWA's Approach to Facility Emergency Planning' document throughout procedure and referenced FEP instead. Aligned wording for level 1, 2 & 3 events (s. 3.2) with wording in 'OCWA's Emergency Response Plan'. Updated training section to include role of SPC Manager (s. 3.5) and expanded testing/review section specifically to clarify how an actual test is documented (s. 3.6). Other minor edits.

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 Town of Erin DWS 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.

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

5. Revision History

Date	Revision #	Reason for Revision
2018-09-21	0	Procedure updated following new template from Corporate Compliance. QP-10 procedure renamed OP-19. Removed Scope and Responsibilities sections and moved scope wording to purpose section. Added definition 'Objective Evidence' and modified 'non-conformance' definition. Replaced 'audit evidence' with 'objective evidence', and 'conformity' with 'conformance' throughout procedure. Replaced 'once every 12 months' with 'once every calendar year' (s. 3.2.1, s. 3.2.3 and s. 3.4.1) to reflect wording in DWQMS v. 2.0. Added s. 3.2.3 (and modified s. 3.4.1) to describe the frequency for auditing all DWSs covered in multi-facility Operational Plans. Changed s. 3.4.2 to include preventive actions, the results of the management review and the status/consideration of OFIs. Included wording 'for each element', and 'identified referencing the requirement that was not met' to s. 3.6.2. Moved description of process for corrective actions from QP-10 s. 5.7 and OFIs from QP-10 s. 5.8 to OP-21. Added s. 3.7 to refer to OP-21.

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 Town of Erin DWS as:

- Operations Management – Highlands
- Regional Hub Manager – Georgian Highlands
- Safety, Process & Compliance (SPC) Manager – Georgian Highlands

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 Town of Erin DWS 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 Town of Erin municipal representative(s).

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
2018-09-21	0	Procedure updated following new template from Corporate Compliance. Removed Scope and Responsibilities sections. Added definitions for Top Management and Operations Management. Revisions based on new requirements of the Standard; at least once every 12 months changed to once every calendar year (s. 3.1) and efficacy changed to effectiveness (s. 3.4). Added s. 3.2 and s. 3.3 to describe who is participating in the Management Review process. Added clarification on including any preventive actions implemented to address Opportunities for Improvement (OFI) or rationale as to why OFIs were not implemented when reviewing audit results (s. 3.4.e). Added Best Management Practices (BMPs) as a standing agenda item (s. 3.4.q). Added s. 3.5 to include consideration of BMPs and link OP-20 to OP-21 Continual Improvement.

1. Purpose

To describe the procedure for tracking and measuring continual improvement of the Quality & Environmental Management System (QEMS) for the *Town of Erin DWS*

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 "Implementation Action Plan" form/table. 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 implementations of preventive actions are tracked by the QEMS Representative using the "Implementation Action Plan" form/table.

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, Conservation, and Parks.

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
Management Review Minutes
Internal Audit Records
Implementation Action Plan form/table

5. Revision History

Date	Revision #	Reason for Revision
2018-09-21	0	Procedure issued – Some of the information within OP-21 was originally set out in the main body of OCWA's Operational Plan (last revision 7 dated 2017-09-25). Information from QP-10 Internal Audit (s. 5.7 and s. 5.8) was incorporated into s. 3.2 and s. 3.3 of OP-21 but was modified to address non-conformances identified from additional inputs other than internal audits and preventive actions resulting from means other than OFIs from internal audits. In addition R&Rs were revised to include the SPC Manager, and to clarify the role of the QEMS Representative in investigating and determining corrective and preventive actions needed. A section on Best Management Practices (s. 3.5) was added to meet the new requirements of DWQMS v. 2.0.

Ontario

Ministry of the Environment and Climate Change

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

Municipal Residential Drinking Water System

Fields marked with an asterisk (*) are mandatory.

Owner of Municipal Residential Drinking Water System *
The Corporation Of The Town of Erin

Name of Municipal Residential Drinking Water System *
Erin Drinking Water System

Subject Systems

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

	Name of Operational Subsystems(if Applicable)	Name of Operating Authority *	DWS Number(s) *
1		Ontario Clean Water Agency	220000013

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

Contact Information 1

Last Name *	First Name *	Middle Initial
Irvine	Don	

Title *	Phone Number *
Operations Manager	519 321-9474

Email Address *
dirvine@ocwa.com

Contact Information 2

Last Name *	First Name *	Middle Initial
Cortes	Melissa	

Title *	Phone Number *
Process and Compliance Technician	519 938-6909

Email Address *
mcortes@ocwa.com

Ontario

Ministry of the Environment and Climate Change

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

Municipal Residential Drinking Water System

Fields marked with an asterisk (*) are mandatory.

Owner of Municipal Residential Drinking Water System *
The Corporation Of The Town of Erin

Name of Municipal Residential Drinking Water System *
Hillsburgh Drinking Water System

Subject Systems

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

	Name of Operational Subsystems(if Applicable)	Name of Operating Authority *	DWS Number(s) *
1		Ontario Clean Water Agency	220007285

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

Contact Information 1

Last Name *	First Name *	Middle Initial
Irvine	Don	

Title *	Phone Number *
Operations Manager	519 321-9474

Email Address *
dirvine@ocwa.com

Contact Information 2

Last Name *	First Name *	Middle Initial
Cortes	Melissa	

Title *	Phone Number *
Process and Compliance Technician	519 938-6909

Email Address *
mcortes@ocwa.com

