

# Township of Huron-Kinloss

## Operational Plan

### Drinking Water Quality Management Standard

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**Drinking Water Works Permit No.**

- 087-201
- 087-202
- 087-203
- 087-204
- 087-205

**Municipal Drinking Water Licence No.**

- 087-101
- 087-102
- 087-103
- 087-104
- 087-105

**REVISION 15**



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## Introduction

Quality Management Systems and Standards have been actively used in North America since the early 1950's. In 1987, the International Organization for Standardization (ISO) released the first version of the ISO 9001 Quality Management System Standard, which is used worldwide.

Incorporating a mandatory Province-wide Quality Management Standard into the management of Ontario's Drinking Water Systems was the result of a recommendation in Part Two of the Report of The Walkerton Inquiry by Justice Dennis R. O'Connor in May, 2002. The *Safe Drinking Water Act (SDWA), 2002*, followed. Regulations made under the *SDWA* provide the requirements for Drinking Water Systems, testing services, quality standards, certification of Operators and Water Quality Analysts, as well as compliance and enforcement.

The Drinking Water Quality Management Standard (DWQMS), as described in the *SDWA* prescribes a Quality Management System (QMS) or Operational Plan, which specifies the minimum requirements for an Operating Authority of a subject system to:

- Facilitate the Operating Authority's ability to consistently produce and/or deliver drinking water that meets applicable legislative, regulatory and Owner requirements; and to
- Enhance consumer protection through the effective application and continual improvement of the QMS.

The purpose of incorporating a quality management approach for Drinking Water Systems is to protect public health by achieving consistent and effective/efficient operating and management practices. Key components of the DWQMS include:

- Adoption of best practices and continual improvement
- Operating with robust multiple barriers to protect public health
- Preventative measures rather than reactive strategies to identify and manage risk
- Effective Leadership

This Operational Plan outlines the QMS and describes the methods used by the Township of Huron-Kinloss and the Operating Authority to provide and consistently maintain safe drinking water. Using a systematic and proactive approach, the Operational Plan provides a foundation for consistency, safety and efficiency, as well as meeting legislative requirements.

This Operational Plan is implemented and carried out by the Township of Huron-Kinloss and Operating Authority, and is approved by the Mayor and Council. The QMS Representative, appointed by Top Management and approved by the Mayor and Council, is responsible for ensuring that all processes and procedures are established and maintained, promoting awareness and ensuring commitment to the Operational Plan. The QMS



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Representative reports to Top Management on QMS performance and any need for improvement. These findings are forwarded to the Mayor and Council for review and approval.

## 1. Element 1 - Quality Management System

### 1.1 PROCEDURE DESCRIPTION

The Township of Huron-Kinloss, as the Owner, and Veolia Water, as the Operating Authority of the Township's Drinking Water Systems, is required to attain conformance to the Drinking Water Quality Management Standard (DWQMS) developed by the Ministry of the Environment, Conservation and Parks. This Operational Plan has been developed to represent the Operating Authority's Quality Management System (QMS) that conforms to the Standard.

### 1.2 REASON FOR PROCEDURE

The Quality Management System, as described in this Operational Plan, applies to all of the requirements prescribed in the Standard.

### 1.3 DEFINITIONS

Not applicable

### 1.4 PROCEDURE

The DWQMS requires an Operating Authority to establish a QMS for each Drinking Water System that it operates.

A QMS is a system to establish policies and objectives, achieve those objectives, and assist in the direction and control of the organization with regard to quality.

An Operational Plan is a document or series of documents that outlines the policies, processes and procedures for the overall quality management of the Drinking Water Systems, and is the documentation of the QMS.

The QMS is documented in this Operational Plan as part of the effort to ensure clean, safe, and reliable drinking water is supplied to all customers served.

The QMS shall be reviewed annually to ensure that the procedures are correct and current. The review may include the QMS Representative, Owner, Operating Authority, or Operators of the systems.



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The ultimate goal of achieving conformance to the DWQMS must be fully understood, and activities must strive to meet the requirements of the Standard. A focus on continuous improvement is the cornerstone for breakthrough thinking and innovation.



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**1.5 ASSOCIATED DOCUMENTS**

None Applicable

**1.6 REFERENCE MATERIALS**

Drinking Water Quality Management Standard



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## 2 Element 2- Quality Management System Policy

### 2.1 PROCEDURE DESCRIPTION

The Township of Huron-Kinloss (Owner) has retained the services of Veolia Water Canada to operate and maintain the water supplies and distribution systems.

Together, the Township of Huron-Kinloss and Veolia are committed to:

- Providing the consumer with a consistent supply of clean, safe drinking water
- Meeting or surpassing all applicable legislative and regulatory requirements
- Managing and operating the water supply systems in a responsible manner in accordance with documented Quality Management System (QMS) policies and procedures
- Maintaining and continually improving its QMS

### 2.2 REASON FOR PROCEDURE

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

### 2.3 DEFINITIONS

None Applicable

### 2.4 PROCEDURE

The Township of Huron-Kinloss and the Operating Authority who are directly involved in the treatment, supply, and distribution of drinking water, share in the responsibilities of implementing, maintaining, and contributing to the continual improvement of the Drinking Water Systems through the QMS.

### 2.5 ASSOCIATED DOCUMENTS

E2 - QMS Policy Statement

### 2.6 REFERENCE MATERIALS

None Applicable



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## 3. Element 3- Commitment and Endorsement

### 3.1 PROCEDURE DESCRIPTION

Commitment and Endorsement refers to the Quality Management System as described in the Operational Plan, for the Drinking Water Systems in the Township of Huron-Kinloss.

### 3.2 REASON FOR PROCEDURE

To communicate Top Management's commitment to and endorsement of the Quality Management System described in this Operational Plan.

### 3.3 DEFINITIONS

None Applicable

### 3.4 PROCEDURE

The Township of Huron-Kinloss (Owner), and Veolia Water Canada (Operating Authority), support the implementation, maintenance, and continual improvement of a Drinking Water Quality Management System (QMS) for the Township of Huron-Kinloss Water Supply Systems, as documented in the Operational Plan.

Endorsement by the Owner (represented by the Township of Huron-Kinloss Administrator), and the Operating Authority Top Management (represented by Veolia Water Canada Project Manager) acknowledges the need for, and supports the provision of sufficient resources to implement, maintain, and continually improve the Quality Management System (QMS).

Top Management is also committed to communicating the QMS according to Element 12 - Communications of the Operational Plan. The QMS Representative, approved by the Mayor and Council, acknowledges the roles and responsibilities of the appointment.

### 3.5 ASSOCIATED DOCUMENTS

E3 - Commitment and Endorsement

### 3.6 REFERENCE MATERIALS

None Applicable





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## 4. Element 4- QMS Representative

### 4.1 PROCEDURE DESCRIPTION

This procedure describes the role of the QMS Representative as it pertains to the operation and maintenance of the QMS.

### 4.2 REASON FOR PROCEDURE

To identify the role of the QMS Representative for the Township of Huron-Kinloss and describe the specific responsibilities and authorities placed upon the Representative.

### 4.3 DEFINITIONS

Authority: Official permission or approval to carry out a responsibility or task

Responsibility: A charge, trust, or duty, for which one is responsible. To be responsible means to be correspondent or answerable, accountable to another for something.

### 4.4 PROCEDURE

The QMS Representative has been appointed by Top Management and approved by the Township of Huron-Kinloss Council. The QMS Representative regardless of other responsibilities shall:

- A. Administer the QMS by ensuring that processes and procedures need for the QMS are established and maintained,
- B. Report to Top Management on the performance of the QMS and any need for improvement,
- C. Ensure that current versions of documents required by the QMS are being used at all times,
- D. Ensure that personnel are aware of all applicable legislative and regulatory requirements that pertain to their duties for the operation of the water supply systems, and
- E. Promote awareness of the QMS throughout the Operating Authority.

The responsibilities of the QMS Representative are listed in the Responsibilities Table in Appendix E, as part of Element 9 - Organizational Structure, Roles, Responsibilities and Authorities.

Should the QMS Representative position be vacant, an "Interim QMS Representative" may be appointed by Top Management to satisfy the responsibilities identified above. This shall be a



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temporary assignment until a permanent QMS Representative can be identified and brought forward for Council approval. The Interim QMS Representative will have the same responsibilities and authorities as those identified for the QMS Representative throughout the QMS and all supporting documents.



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#### 4.5 ASSOCIATED DOCUMENTS

E4 - Notice of Appointment - QMS Rep.

E4 - Notice of Appointment - QMS Alt.

E4 - QMS Orientation Checklist

E9 - Job Description and Employee Orientation

#### 4.6 REFERENCE MATERIALS

None Applicable



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## 5. Element 5- Document and Records Control

### 5.1 PROCEDURE DESCRIPTION

This procedure outlines and defines the process of managing, maintaining and protecting all documents and records required for conformance of the DWQMS.

### 5.2 REASON FOR PROCEDURE

To ensure that all QMS related documents and records are managed and controlled according to regulatory requirements and established protocols.

### 5.3 DEFINITIONS

Documents:	Policies, Standard Operating Procedures, Emergency Response Plans, Forms, Regulations, Associated Documents, etc.
Records:	Documents containing recorded data such as daily data logs, training records, forms, maintenance records, etc.
Controlled:	Considered the most current approved version of a document.
Uncontrolled Copy:	For information only. An uncontrolled copy means it may be out of date.

### 5.4 PROCEDURE

The establishment and maintenance of an effective document and records control system is the foundation of any quality management system. A procedure for both documents and records controls has been established to describe how:

- A. Documents required by the QMS are:
  - a. Kept current, legible and readily identifiable
  - b. Retrievable
  - c. Stored, protected, retained and disposed of, and
- B. Records required by the QMS are:
  - a. Kept legible, and readily identifiable
  - b. Retrievable
  - c. Stored, protected, retained and disposed of.

All QMS documents are to be reviewed annually.



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## 5.5 ASSOCIATED DOCUMENTS

- E5 - Document and Records Control Procedure
- E5 - Document and Records Control Table
- E5 - Document Approval - Change Form
- E5 - Operational Plan Change History Table
- E19 - Non-Conformance and Corrective Action Report
- E19 - Action Item Request / Opportunity For Improvement Form
- QMS - Longterm Spreadsheet

## 5.6 REFERENCE MATERIALS

None Applicable



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## 6. Element 6- Drinking Water Systems

### 6.1 PROCEDURE DESCRIPTION

The Township of Huron-Kinloss, together with Veolia Water Canada, provide potable water to the residents and businesses in the Township of Huron-Kinloss and two distribution systems that extend into the Township of Ashfield-Colborne-Wawanosh (ACW). There are four (4) Drinking Water Systems that supply water. They are:

- **Lakeshore Drinking Water System (Water Distribution and Supply Class 3)**
  - Also supplies to Courtney Subdivision Distribution System in ACW
- **Ripley Drinking Water System (Water Distribution and Supply Class 2)**
- **Lucknow Drinking Water System (Water Distribution and Supply Class 2)**
  - Also supplies to South Lucknow Distribution System in ACW
- **Whitechurch Drinking Water System (Limited System)**

There is another distribution system within the Township of Huron-Kinloss to the north of the Lakeshore DWS called Huronville Subdivision Distribution System that is supplied by the Municipality of Kincardine. There is an interconnecting valve between the Lakeshore Well Supply to the Huronville Subdivision Distribution System and/or the Town of Kincardine. This valve is normally closed and is to be used for emergency purposes only. The Municipality of Kincardine is responsible for the Operational Plan of the Huronville Subdivision Distribution System.

The raw water drawn for the Lakeshore, Ripley, Lucknow and Whitechurch DWSs is classified as secure groundwater that is NOT under the direct influence of surface water.

The Owner and the Operating Authority incorporate a multi-barrier approach to prevent or reduce the contamination of drinking water. This includes an integrated system of procedures, processes, automatic control systems, a Supervisory Control and Data Acquisition (SCADA) automation system, and an independent auto-dialer alarm system.

### 6.2 REASON FOR PROCEDURE

To ensure processes and procedures are in place to assess the current capability of the Owner and Operating Authority's management and operating systems for providing safe drinking water.

### 6.3 DEFINITIONS

None Applicable





## 6.4 SYSTEM DESCRIPTIONS

### LAKESHORE

#### RAW WATER CHARACTERISTICS

The Lakeshore DWS supply consists of six (6) drilled bedrock wells, of which four (4) are currently in use. These are:

Point Clark:	PCD-W2	drilled in 1994 (75.6 m deep)
	PCD-W3	drilled in 2015 (82.3 m deep)
Murdoch Glen:	MG-W2	drilled in 1992 (80.5 m deep)
Blairs Grove:	BG-W2	drilled in 1982 (73.2 m deep) abandoned in March 2022
	BG-W3	drilled in 1994 (74.0 m deep)
Huronville South:	HS-W2	drilled in 1994 (93.3 m deep)

Each well is equipped with a submersible pump, and treatment at all locations consists of disinfection using sodium hypochlorite (12%) and iron sequestering using sodium silicate.

Up until the end of August 2020, the production well at Blairs Grove was BG-W2. In August, the Township completed a video inspection of BG-W2 and found the casing to be corroded and separated in different locations. They have since discontinued pumping from BG-W2 and completed the well abandonment in March of 2022. BG-W3 has been equipped with pumping equipment and put into service in January 2021.

BG-W3 is a flowing artesian well with high levels of naturally occurring calcium, fluoride, hardness, iron, and sodium.

All wells: The microbiology and turbidity data for the raw water indicate that there are no observed trends in water quality and all the wells are characteristic of a “groundwater” source.



## LAKESHORE

### RAW WATER CHARACTERISTICS

Most of the inorganic parameter results (O. Reg. 170/03, Schedule 23) are consistent and below the (O. Reg. 169/03) permitted values. The Organic parameter results are consistently below detection limits for all wells. The following table summarizes elevated levels (most recent results):

Site	Arsenic (µg/L)	Hardness (as CaCO <sub>3</sub> ) (mg/L)	Fluoride (mg/L)	Iron (µg/L)	Sodium (mg/L)
<b>Half-MAC</b>	<b>5</b>	--	--	--	--
<b>MAC</b>	<b>10</b>	--	<b>1.5</b>	--	<b>20</b>
<b>AO/OG</b>	--	<b>80-100</b>	--	<b>300</b>	<b>200</b>
<b>Blairs Grove</b>	0.4	765	<b>1.71</b>	581	<b>100</b>
<b>Huronville South</b>	0.4	237	<b>2.19</b>	150	<b>54.3</b>
<b>Murdoch Glen</b>	1.6	246	<b>2.12</b>	102	<b>63.2</b>
<b>Point Clark</b>	<b>5.6</b>	308	<b>2.04</b>	311	<b>25.3</b>

MAC: Maximum Allowable Concentration

AO/OG: Aesthetic Objective/Operational Guideline

### DISINFECTION SYSTEM

Each pumphouse in the Lakeshore DWS ensures that raw water is disinfected and undergoes iron sequestering. Sodium hypochlorite (12%), the chemical used in the disinfection process, disinfects the raw water, and serves primarily as a measure to prevent microbiological growth within the raw water pipeline, reservoir, and distribution system.

The Lakeshore DWS has two different methods to achieve chlorine contact time. Three pumphouses have a chlorine contact chamber (baffled basement reservoir), while the Murdoch Glen pumphouse has a chlorine contact watermain.

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

In the pumphouses, the sodium hypochlorite is added prior to the water entering the chlorine contact chambers at dosages high enough to achieve both primary and secondary disinfection objectives. The free chlorine residual was monitored at the Point of Entry (POE) to the distribution system with a target residual of >1.20 mg/L and <1.80 mg/L.



## **LAKESHORE**

### **IRON SEQUESTERING**

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

### **SYSTEM FLOWS**

The Lakeshore DWS has four (4) separate Permits to Take Water (PTTW). These are:

● Point Clark:	#2024-9N6HND Expires: Nov. 1, 2024 3,273.12 m <sup>3</sup> /day
● Murdoch Glen: 2025	#6123-A2UQBM Expires: Oct. 15, 1,814.40 m <sup>3</sup> /day
● Huronville South:	#3332-9N6H8L Expires: Nov. 1, 2024 3,927.744 m <sup>3</sup> /day
● Blairs Grove: 2030	#5776-BW6SKS Expires: Dec. 31, 2,620.80 m <sup>3</sup> /day
<b>TOTAL:</b>	<b>11,636.264 m<sup>3</sup>/day</b>

In addition to the total m<sup>3</sup>/day, the four (4) pumphouses each have a maximum flow as specified in the respective PTTWs. These are:

- Point Clark: 2,273 L/min (37.88 L/s)
- Murdoch Glen: 1,260 L/min (21.00 L/s)
- Huronville South: 2,728 L/min (45.46 L/s)
- Blairs Grove: 1,820 L/min (30.30 L/s)

The CT calculations for each site are based on these maximum flows. For simplicity, these values are expressed as L/s in order to coincide with the SCADA monitoring.



The limiting factor regarding flow is chlorine contact time in the reservoirs (or contact watermain). In order to meet the regulatory CT requirements (CT value >4), the maximum flow permitted must correspond with a free chlorine residual of 0.50 mg/L.

## **DISTRIBUTION SYSTEM**

The Lakeshore DWS currently services 2,441 water connections in the Huron-Kinloss Lakeshore community, extending from Point Clark in the south, to Huronville in the north, and 140 water connections in the subsystem supplying the Courtney/Amberley Beach Subdivision in the Township of Ashfield-Colborne-Wawanosh. In total, the Lakeshore DWS supplies an estimated seasonal population of approximately 6,347. The Lakeshore area has a large seasonal population and therefore, the demands are significantly higher during the cottage season.

## **LAKESHORE**

### **DISTRIBUTION SYSTEM**

The Lakeshore Distribution System comprises three different pressure zones. Interconnections permit water to be transmitted from one pressure zone to another, including during emergency or firefighting conditions. Pressure Zone 1 (the southern system) comprises the Point Clark pumphouse, the Blairs Grove pumphouse, and the Standpipe. The northern portion of the Lakeshore DWS is divided into two pressure zones (Pressure Zone 2 and Pressure Zone 3). Pressure Zone 2 is serviced by the Huronville South pumphouse, and Zone 3 is serviced by the Murdoch Glen pumphouse. Murdoch Glen has the capability of supplying Zone 2 and Zone 3, plus stand-by with the diesel generator if required.

The Township of Huron-Kinloss has an agreement with the Municipality of Kincardine, where Kincardine is the Operating Authority for a small area of Huron-Kinloss known as the Huronville Subdivision Distribution System (M28). This subdivision receives all their water from the Municipality of Kincardine Water System.

The 94.4 km distribution piping consists of PVC and polyethylene piping.

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

A Standpipe is situated in the Point Clark area at 3405 Concession 2, and is constructed of bolted steel. The 31 m high and 9.4 m wide Standpipe has an effective storage of approximately 1,500 m<sup>3</sup>. The high lift pumps for the Point Clark pumphouse and the Blairs Grove pumphouse are



automatically controlled by the water level in the Standpipe. The Standpipe is surrounded by a chain-link fence and has padlocks to prevent unwarranted entry.

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

Watermain upgrades since 1996 include isolation valves and sufficient size piping for hydrants and firefighting. Distribution piping is Polyethylene or PVC and ranges from 50 mm to 250 mm in diameter. There are 181 hydrants, 46 blow-offs, and one (1) automatic flushing device is located on Camerons Lane. For sampling purposes, there are six (6) sample stations, two (2) of which are located in ACW on Amberley Beach Road.

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

## **RIPLEY**

### **RAW WATER CHARACTERISTICS**

The Ripley DWS is currently supplied by four (4) drilled bedrock wells:

Well No. 1	drilled in 1946 (84.4 m deep)
Well No. 2	drilled in 1994 (85.3 m deep)
Well No. 3	drilled in 2012 (89.9 m deep)
Well No. 4	drilled in 2011 (89.9 m deep)

### **Ripley Pumphouse:**

Each well is equipped with a submersible well pump. Well No. 1 and No. 2 are located at 74 Huron St and are approximately 30 m apart. The water from both of these wells is treated at the same pumphouse. Disinfection is accomplished using 12% sodium hypochlorite.

Well No. 1 and No. 2 are considered to be hydraulically connected and both wells have levels of naturally occurring fluoride and sodium that exceed the Ontario Drinking Water Quality Standards. The Arsenic level is very close to the Half-MAC and is being monitored quarterly.



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**Ripley Elevated Tank:**

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

Well No. 3 and No. 4 are considered to be hydraulically connected and both wells have levels of naturally occurring fluoride and sodium that exceed the Ontario Drinking Water Quality Standards.

All four (4) production wells have been characterized as “groundwater” supplies. The microbiological and turbidity data indicates that no water quality trends have been observed.



## **RIPLEY**

### **RAW WATER CHARACTERISTICS**

Most of the inorganic parameter results (O. Reg. 170/03, Schedule 23) are consistent and below the (O. Reg. 169/03) permitted values. The Organic parameter results are consistently below detection limits for all wells. The following table summarizes some elevated levels (most recent results):

Site	Arsenic (µg/L)	Hardness (as CaCO <sub>3</sub> ) (mg/L)	Fluoride (mg/L)	Iron (µg/L)	Sodium (mg/L)
<b>Half-MAC</b>	<b>5</b>	--	--	--	--
<b>MAC</b>	<b>10</b>	--	<b>1.5</b>	--	<b>20</b>
<b>AO/OG</b>	--	<b>80-100</b>	--	<b>300</b>	<b>200</b>
<b>Well No. 1 &amp; 2 (TW)</b>	3.6	212	<b>2.1</b>	197	<b>28.6</b>
<b>Well No. 3</b>	0.9	190	<b>2.1</b>	ND	<b>30</b>
<b>Well No. 4</b>	0.8	220	<b>1.9</b>	ND	<b>30</b>

MAC: Maximum Allowable Concentration

AO/OG: Aesthetic Objective/Operational Guideline

ND: Not Detected

### **DISINFECTION SYSTEM**

The Ripley Pumphouse and the Ripley Elevated Tank (ET) site ensure that raw water is disinfected. Sodium hypochlorite (12%), the chemical used in the disinfection process, disinfects the raw water and serves primarily as a measure to prevent microbiological growth within the raw water pipeline, and the distribution system. The Pumphouse and the ET site have chlorine contact water mains to provide chlorine contact time between sodium hypochlorite and the raw water ensuring the deactivation of pathogens should they be present in the drinking water supply.

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

In the pumphouses, the sodium hypochlorite is added prior to the water entering the chlorine contact watermain at dosages high enough to achieve both primary and secondary disinfection



objectives. The free chlorine residual was monitored at the Point of Entry (POE) to the distribution system with a target residual of  $>1.20$  mg/L and  $<1.80$  mg/L.

## **RIPLEY**

### **SYSTEM FLOWS**

The Ripley DWS has one Permit to Take Water (PTTW) for all four wells. In addition to the total  $m^3/day$ , the wells have a maximum flow and maximum runtime:

PTTW #4634-ANZKYM Expires: May 31, 2027

• Ripley Well No. 1 & 2:	1,818 L/min (30.3 L/s)	864 $m^3/day$	24 h/day
• Ripley Well No. 3:	1,400 L/min (23.3 L/s)	2,016 $m^3/day$	24 h/day
• Ripley Well No. 4:		1,400 L/min (23.3 L/s)	1,386
	$m^3/day$	17 h/day	

**TOTAL: 4,266  $m^3/day$**

The CT calculations for each site are based on these maximum flows. For simplicity, these values are expressed as L/s in order to coincide with the SCADA monitoring.

The limiting factor regarding flow is chlorine contact time in the contact watermain. In order to meet the regulatory CT requirements (CT value  $>4$ ), the maximum flow permitted must correspond with a free chlorine residual of 0.50 mg/L.

### **DISTRIBUTION SYSTEM**

The Ripley DWS has 366 water connections, and provides potable water to an estimated population of 951 residents.

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

The system pressure is maintained by the Ripley Elevated Tank, which was constructed in 2019, and put on-line in 2020. The 42 m (138 ft) high Elevated Tank has a total usable storage volume of 1,465  $m^3$ . The system pressure varies between 350 - 390 kPa (50 - 56 psi).

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



A 250 kW stand-by diesel generator and a 2,273 L fuel storage tank are located in the Fire Hall adjacent to the pumphouse, which provides emergency power to the pumphouse and Ripley Fire Hall. A Source Water Protection Plan is in place for the below-grade fuel tank.

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

## **LUCKNOW**

### **RAW WATER CHARACTERISTICS**

The Lucknow DWS supply consists of two (2) drilled bedrock wells:

Lucknow Well No. 4      drilled in 1959

Lucknow Well No. 5      drilled in 1967

Both production wells have been characterized as “groundwater” supplies. The microbiological and turbidity data indicates that no water quality trends have been observed.

#### **Lucknow Well No. 4:**

The well is equipped with a submersible well pump and is located at 600 Havelock St. Disinfection is accomplished using 12% sodium hypochlorite.

Lucknow Well No. 4 has levels of naturally occurring fluoride that exceeds the Ontario Drinking Water Quality Standards. The Arsenic level is very close to the Half-MAC and is being monitored quarterly.

#### **Lucknow Well No. 5:**

The well is equipped with a submersible well pump and is located at 381 South Delhi St. Disinfection is accomplished using 12% sodium hypochlorite.

Lucknow Well No. 5 has levels of naturally occurring fluoride that exceeds the Ontario Drinking Water Quality Standards. The Arsenic level is very close to the Half-MAC and is being monitored quarterly.





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Most of the inorganic parameter results (O. Reg. 170/03, Schedule 23) are consistent and below the (O. Reg. 169/03) permitted values. The Organic parameter results are consistently below detection limits for all wells. The following table summarizes some elevated levels (most recent results):



## LUCKNOW

### RAW WATER CHARACTERISTICS

Site	Arsenic (µg/L)	Hardness (as CaCO <sub>3</sub> ) (mg/L)	Fluoride (mg/L)	Iron (µg/L)	Sodium (mg/L)
<b>Half-MAC</b>	<b>5</b>	--	--	--	--
<b>MAC</b>	<b>10</b>	--	<b>1.5</b>	--	<b>20</b>
<b>AO/OG</b>	--	<b>80-100</b>	--	<b>300</b>	<b>200</b>
<b>Well No. 4</b>	3.5	206	<b>1.75</b>	132	11.1
<b>Well No. 5</b>	4.7	209	<b>1.78</b>	264	12.8

MAC: Maximum Allowable Concentration

AO/OG: Aesthetic Objective/Operational Guideline

### DISINFECTION SYSTEM

Each pumphouse in the Lucknow DWS ensures that raw water is disinfected. Sodium hypochlorite (12%), the chemical used in the disinfection process, disinfects the raw water, and serves primarily as a measure to prevent microbiological growth within the raw water pipeline, standpipe, and distribution system.

The Lucknow DWS achieves chlorine contact time through chlorine contact watermains.

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

In the pumphouses, the sodium hypochlorite is added prior to the water entering the chlorine contact watermain at dosages high enough to achieve both primary and secondary disinfection objectives. The free chlorine residual was monitored at the Point of Entry (POE) to the distribution system with a target residual of >1.20 mg/L and <1.80 mg/L.

### SYSTEM FLOWS

The Lucknow DWS has one (1) Permit to Take Water (PTTW). In addition to the total m<sup>3</sup>/day, the wells have a maximum flow:

PTTW #7631-AQYS3J Expires: September 30, 2027

- Lucknow Well No. 4: 865 L/min (14.41 L/s) 935 m<sup>3</sup>/day 24 h/day




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• Lucknow Well No. 5:	2,275 L/min (37.91 L/s)	1,500 m <sup>3</sup> /day	24 h/day
<b>TOTAL:</b>		<b>1,500 m<sup>3</sup>/day</b>	

## **LUCKNOW**

### **SYSTEM FLOWS**

The CT calculations for each site are based on these maximum flows. For simplicity, these values are expressed as L/s in order to coincide with the SCADA monitoring.

The limiting factor regarding flow is chlorine contact time in the contact watermain. In order to meet the regulatory CT requirements (CT value >4), the maximum flow permitted must correspond with a free chlorine residual of 0.50 mg/L.

### **DISTRIBUTION SYSTEM**

The Lucknow DWS has approximately 670 water service connections. Through a watermain extension, southward along Lucknow Line (Huron County Road 1), the Lucknow distribution system also supplies drinking water to approximately 10 properties in the Municipality of Ashfield-Colborne-Wawanosh (ACW) in Huron County. This section of the distribution system is known as South Lucknow. In total, the Lucknow DWS serves an estimated population of approximately 1,742.

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

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

The Lucknow DWS has elevated storage in the form of a standpipe located at 656 Wheeler St. The total operating volume of the standpipe is 996 m<sup>3</sup> (27.5 m H, 6.7 m diameter). The well pumps at Well No. 4 and Well No. 5 are automatically controlled by the water level in the standpipe. The Lucknow Standpipe is scheduled to be replaced with a new Elevated Tank. Construction is set to begin in 2023.

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

## WHITECHURCH

### RAW WATER CHARACTERISTICS

The Whitechurch DWS consists of two (2) drilled bedrock wells:

Well No. 1 (South)	drilled in 2003
Well No. 2 (North)	drilled in 2003

Each well is equipped with a submersible well pump. Both wells are located at 9A Whitechurch St and are approximately 15 m apart. The water from both these wells is treated at the same pumphouse. Disinfection is achieved using 12% sodium hypochlorite.

Both production wells have been characterized as “groundwater” supplies. The microbiological and turbidity data indicates that no water quality trends have been observed.

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

Most of the inorganic parameter results (O. Reg. 170/03, Schedule 23) are consistent and below the (O. Reg. 169/03) permitted values. The Organic parameter results are consistently below detection limits for both wells. The following table summarizes some elevated levels (most recent results):

Site	Barium (µg/L)	Hardness (as CaCO <sub>3</sub> ) (mg/L)	Fluoride (mg/L)	Iron (µg/L)	Sodium (mg/L)
Half-MAC	500	--	--	--	--
MAC	1000	--	1.5	--	20
AO/OG	--	80-100	--	300	200
Well No. 1 & 2 (TW)	902	292	1.09	744	17.9

MAC: Maximum Allowable Concentration

AO/OG: Aesthetic Objective/Operational Guideline

### DISINFECTION SYSTEM

The Whitechurch pumphouse ensures that raw water is disinfected. Sodium hypochlorite (12%), is used to provide disinfection to the raw water and serves as a measure to prevent microbiological growth within the raw water pipeline, the pressure tanks, the mixing tanks, and



the distribution system. The pumphouse has a chlorine contact watermain to provide chlorine contact time between sodium hypochlorite and the raw water, ensuring the deactivation of pathogens should they be present in the drinking water supply.

## WHITECHURCH

### DISINFECTION SYSTEM

The disinfection system includes two (2) chemical feed pumps (one dedicated for each well) and a chemical storage tank, complete with secondary containment. Chlorine contact time is achieved via the contact watermain. Chlorine residuals are continuously monitored by on-line instrumentation to verify the pumphouse is supplying safe drinking water to the system.

In the pumphouse, sodium hypochlorite is added prior to the water entering the chlorine contact watermain at dosages high enough to achieve both primary and secondary disinfection objectives. The free chlorine residual is monitored at the Point of Entry (POE) to the distribution system with a target residual of  $>1.20$  mg/L and  $<1.80$  mg/L.

### IRON SEQUESTERING

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

### SYSTEM FLOWS

The Whitechurch DWS has one (1) Permit to Take Water (PTTW).

In addition to the total  $m^3/day$ , the wells have a maximum flow:

PTTW #1124-A4DMYC: Expires: November 28, 2025

- |               |                      |               |          |
|---------------|----------------------|---------------|----------|
| • Well No. 1: | 197 L/min (3.28 L/s) | 260 $m^3/day$ | 24 h/day |
| • Well No. 2: | 197 L/min (3.28 L/s) | 260 $m^3/day$ | 24 h/day |

**TOTAL: 260  $m^3/day$**

The CT calculation is based on the maximum flow. For simplicity, this value is converted to L/s in order to coincide with the SCADA monitoring.



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The limiting factor regarding flow is chlorine contact time in the contact watermain. In order to meet the regulatory CT requirements (CT value >4), the maximum flow permitted must correspond with a free chlorine residual of 0.50 mg/L.



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## **WHITECHURCH**

### **DISTRIBUTION SYSTEM**

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

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

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

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

### **SUPERVISORY CONTROL AND DATA ACQUISITION (SCADA) SYSTEM**

A SCADA automation system is used to monitor and control processes at all the pumphouses and elevated storage facilities. While most of the processes are run automatically by local PLC units, the SCADA system continuously records operations, provides alarm notifications, and allows Operators to remotely monitor and control the system processes.

### **SAMPLING AND TESTING**

All sampling and monitoring is carried out in accordance with O. Reg. 170/03, O. Reg. 248/03, as well as the Municipal Drinking Water Licences (MDWL) and Drinking Water Works Permit (DWWP). The SCADA system continuously monitors analyzers for free chlorine residual, pressure and flow. Weekly, quarterly, annual, 36-month, and 60-month sampling for microbiological and chemical analyses are conducted and sent to accredited laboratories as required in O. Reg. 170/03. SCADA reporting, grab samples, Operator observations, and external laboratory test results are recorded and monitored by Operations staff.

### **CURRENCY**



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It is the responsibility of the QMS Representative to ensure that the Drinking Water System Process Description is kept current, updated, when system changes are made, and reviewed at least annually.





## 6.5 ASSOCIATED DOCUMENTS

Blairs Grove Process Schematic  
 Huronville South Process Schematic  
 Murdoch Glen Process Schematic  
 Point Clark Process Schematic  
 Ripley Pumphouse Process Schematic  
 Ripley Elevated Tank Process Schematic  
 Lucknow Well No. 4 Process Schematic  
 Lucknow Well No. 5 Process Schematic  
 Whitechurch Process Schematic  
 Lakeshore Distribution Mapping (including Courtney Subdivision)  
 Ripley Distribution Mapping  
 Lucknow Distribution Mapping (including South Lucknow)  
 Whitechurch Distribution Mapping

## 6.6 REFERENCE MATERIALS

Blairs Grove	PTTW #5776-BW6SKS
Huronville South	PTTW #3332-9N6H8L
Murdoch Glen	PTTW #6123-A2UQBM
Point Clark	PTTW #1852-9YQMAY
Ripley	PTTW #4634-ANZKYM
Lucknow	PTTW #7631-AQYS3J
Whitechurch	PTTW #1124-A4DMYC
Courtney Subdivision	MDWL #080-101 (ACW - considered extension of Lakeshore)
Courtney Subdivision	DWWP #080-201 (ACW - considered extension of Lakeshore)
Lakeshore	MDWL #087-102
Lakeshore	DWWP #087-202
Ripley	MDWL #087-104
Ripley	DWWP #087-204
Lucknow	MDWL #087-103
Lucknow	DWWP #087-203
South Lucknow	MDWL #080-102 (ACW - considered extension of Lucknow)
South Lucknow	DWWP #080-202 (ACW - considered extension of Lucknow)
Whitechurch	MDWL #087-105
Whitechurch	DWWP #087-205



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## 7. Element 7- Risk Assessment

### 7.1 PROCEDURE DESCRIPTION

This procedure describes the process steps used to identify, assess, and determine Critical Control Points (CCPs) for hazards or hazardous events.

### 7.2 REASON FOR PROCEDURE

To ensure that all potential hazards or hazardous events associated with drinking water quality are identified and assessed. The results of identifying and assessing hazards provide staff with guidance to control and properly respond to potential conditions. It also improves the level of Public Health protection.

### 7.3 DEFINITIONS

Control Measures: defined as any procedure, process, device, or means of eliminating, preventing or reducing the risk of a hazardous event.

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 to reduce it to an acceptable level.

Critical Limits: defined as the point at which an Operator must take action to prevent escalation of the critical event or to correct the critical event.

Risk: the probability of identified hazards causing harm, including the magnitude of that harm or the consequences.

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

### 7.4 PROCEDURE AND MEASUREMENT METHODOLOGY

The complete Risk Assessment Review will be performed by the QMS Representative, Overall Responsible Operator, at least one Operator, Project Manager, and representatives from the Township of Huron-Kinloss as deemed necessary (i.e. Director of Public Works). A designate may be appointed if attendees are unable to attend. Participants may be added at the discretion of the QMS Representative.

A complete Risk Assessment Review will be performed every 36 months for all the Drinking Water Systems, which will consist of a table-top session or a remote video session including as many staff as available. These exercises may also be completed when a significant change occurs in operation such as a new process or change of process/equipment.



A Risk Assessment is completed based on the previous Risk Assessment Outcomes. Potential hazardous events and associated hazards as identified in the Ministry of the Environment, Conservation and Parks (MECP) Document titled *Potential Hazardous Events for Municipal Residential Drinking Water Systems* are also to be considered in the Risk Assessment.

In addition, Emergency Management Ontario (EMO) has updated its *Hazard Identification and Risk Assessment (HIRA)* in 2019. Many of the hazards listed there represent **external issues** that can compound **internal personnel coverage issues** that may occur during a pandemic.

All previous hazards and control measures are reviewed using the methodology of Likelihood, Consequence, and Detectability, and are assigned a numeric value between 1 and 5 in each of these categories depending on severity. All three numbers are added together to determine the overall Risk Value using the following format:

#### LIKELIHOOD

Rating	Description	Hazardous Event Occurring
1	Rare	May occur in exceptional circumstances, and has not occurred in the past
2	Unlikely	Could occur at some time, historically has occurred less than once every 5 or 10 years
3	Possible	Has or may occur once or more per year
4	Likely	Has or may occur quarterly
5	Very Likely	One or more occurrences monthly

#### CONSEQUENCE

Rating	Description	Hazardous Event Occurring
1	Insignificant	Little public exposure, little or no health risk
2	Minor	Limited public exposure, minor health risk
3	Moderate	Public exposure, possible health impact on small part of population
4	Significant	Large public exposure, noticeable by public, health risk to small part of population, objectionable aesthetics
5	Major	Large public exposure, health risk to part of population, loss of confidence in system

#### DETECTABILITY

Rating	Description	Hazardous Event Occurring
1	Very Detectable	Easy, on-line monitoring through SCADA
2	Moderately Detectable	Moderately detectable, alarm present but not constantly monitored, indicated by daily or weekly lab results
3	Normally Detectable	Visually detectable through frequent maintenance rounds weekly or more often



<b>4</b>	Poorly Detectable	Visually detectable but inspected less frequently than weekly, lab test conducted quarterly or longer, not normally detected before a problem becomes evident
<b>5</b>	Undetectable	Cannot be detected until problem is evident

After reviewing all of the previous hazards and control measures, any new hazards that group members may feel need to be added are discussed and all revisions, deletions and additions are noted, and the updated Risk Assessment Outcomes documents are generated.

The highest Overall Risk Values are typically indicators of critical events. Based on a review of the Overall Risk Values and the associated events, a Threshold Number is chosen such that all events associated with Risk Values which are equivalent to or greater than the Threshold Number are considered critical. Discretion may be used when determining which events are indeed critical, regardless of the calculated risk. Careful evaluation is completed for each hazard event.

In the case where an event having a higher calculated risk value is not determined by the risk assessment group to be critical, an explanation of the reasoning for this distinction is provided. An explanation of the reasoning is also required if the risk assessment team was to deem an event with a lower calculated risk to be critical as well.

From the identified critical events, the risk assessment group then traces backwards through the water process to determine the specific points where each critically hazardous event originates. These points then become Critical Control Points (CCPs). The final point in a series that leads to a critical event is identified as the Critical Control Point.

Critical Control Points require the establishment of controlled conditions, including Critical Control Limits (CCLs), equipment redundancy, and control and recovery procedures.

Critical Limits are established for values that measure critical events. The limits provide Operators with a range of acceptable values within which no preventive or corrective actions are required.

Critical Limits define the point at which an Operator must take action to prevent escalation of the critical event or to correct the critical event.

Critical Limits are determined based on regulatory requirements, process monitoring capabilities, after-hours response time, and historical plant performance. Process alarms (if available) are normally set at or near Critical Limits. Responses to breached Critical Limits are detailed in the Operations Manuals.



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The Risk Assessment is an ongoing process. In addition to the formalized Risk Assessment Review completed every 36 months, the currency and validity of the information in the Risk Assessment will be verified at least once every calendar year.



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**7.5 ASSOCIATED DOCUMENTS**

QMS - Longterm Spreadsheet

E7 - Risk Assessment Verification Template

E7 - Risk Assessment Tables (Lakeshore, Lucknow, Ripley, Whitechurch)

**7.6 REFERENCE MATERIALS**

MECP - Potential Hazardous Events for Municipal Residential Drinking Water Systems

EMO - Hazardous Identification and Risk Assessment (HIRA)



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## 8. Element 8- Risk Assessment Outcomes

### 8.1 PROCEDURE DESCRIPTION

This procedure describes the approach taken by the Township of Huron-Kinloss and the Operating Authority to detail and document the outcomes of the Risk Assessment process.

### 8.2 REASON FOR PROCEDURE

To establish an effective and organized approach to conducting, assessing and improving hazard risks associated with the Drinking Water System.

### 8.3 DEFINITIONS

*Emergency (relating to the Water System Supply):* a potential situation or service interruption that may result in the loss of the ability to maintain an adequate supply of safe drinking water to consumers.

*Emergency (relating to the Township of Huron-Kinloss Emergency Response Plan):* situations or impending situations caused by forces of nature, an accident, or an intentional act that constitutes a danger or major proportions to life and property.

### 8.4 PROCEDURE

Risk Assessments are documented using the Risk Assessment Outcomes document. Previous Risk Assessment Outcomes are used to conduct Risk Assessment Reviews (annually) and when completing the Risk Assessment exercise again every 36 months.

During the table-top or virtual sessions, the QMS Representative notes all revisions, deletions, and additions to the Risk Assessment Outcomes document and prepares an updated version. The updated document is circulated to all pertinent staff for review and comment. The updated Risk Assessment Outcomes document is then finalized.

### 8.5 DEVIATION AND TRACKING

In order to determine if the Risk Assessment process is adequate and offers appropriate feedback, any deviation from the established Critical Control Limits or Critical Control Points and response actions must be documented and tracked. This will help to facilitate future Risk Assessment reviews, validate the established CCLs and CCPs, and also illuminate areas that require improvement or modification.

These deviations and response actions must also be reported in the Management Review - Element 20.







## Critical Control Point (CCP) Limits

### LAKESHORE

No.	Hazard	CCP Limit
7	Chemical feed system failure	1.0 mg/L residual alarm and lockout
12	Contamination of the chlorine contact chamber with improperly disinfected water	1.0 mg/L residual alarm and lockout
13	High lift pump failure	SCADA and Sensaphone alarms
14	High lift pump lock-out due to control loss	SCADA and Sensaphone alarms
15	Inadequate chlorine residual in distribution system	1.0 mg/L residual alarm and lockout; daily residuals, weekly sampling, semi-annual flushing

### RIPLEY

No.	Hazard	CCP Limit
7	Chemical feed system failure	1.0 mg/L residual alarm and lockout
9	Degradation of sodium hypochlorite	Dosage calculation, strength determination
11	Contamination of the chlorine contact chamber with improperly disinfected water	1.0 mg/L residual alarm and lockout
14	Inadequate chlorine residual in distribution system	1.0 mg/L residual alarm and lockout; daily residuals, weekly sampling, semi-annual flushing
15	Water main break	Pressure alarms, backup pumps
17	Loss of system pressure	Pressure alarms, backup pumps

### LUCKNOW

No.	Hazard	CCP Limit
7	Chemical feed system failure	1.0 mg/L residual alarm and lockout
10	Contamination of the chlorine contact chamber with improperly disinfected water	1.0 mg/L residual alarm and lockout
11	Inadequate chlorine residual in distribution system	1.0 mg/L residual alarm and lockout; daily residuals, weekly sampling, semi-annual flushing
12	Water main break	Pressure alarms, backup pumps
14	Loss of system pressure	Pressure alarms, backup pumps




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**WHITECHURCH**

No.	Hazard	CCP Limit
7	Chemical feed system failure	1.0 mg/L residual alarm and lockout
12	Contamination of the chlorine contact chamber with improperly disinfected water	1.0 mg/L residual alarm and lockout
13	Inadequate chlorine residual in distribution system	1.0 mg/L residual alarm and lockout; daily residuals, weekly sampling, semi-annual flushing
14	Water main break	Pressure alarms, backup pumps
16	Loss of system pressure	Pressure alarms, backup pumps

**8.6 ASSOCIATED DOCUMENTS**

E7 - Risk Assessment Table  
 QMS - Longterm Spreadsheet  
 E20 - Management Review - Template

**8.7 REFERENCE DOCUMENTS**

None applicable



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## 9. Element 9 - Organizational Structure, Roles, Responsibilities and Authorities

### 9.1 PROCEDURE DESCRIPTION

This procedure describes the organizational structure, roles, responsibilities and authorities associated with the Drinking Water System and the QMS.

### 9.2 REASON FOR PROCEDURE

To ensure all personnel associated with the Drinking Water System are aware of their regulatory requirements in the provision of safe drinking water.

### 9.3 DEFINITIONS

None Applicable

### 9.4 PROCEDURE

The structure of the organization is depicted in the Veolia Organizational Structure Chart, and the Township of Huron-Kinloss Organizational Structure Chart. Relevant staff are listed in the DWQMS document.

The Township of Huron-Kinloss is the Owner and Veolia Water Canada has been retained as the Operating Authority for its Drinking Water Systems. The Owner and the Operating Authority are responsible for ensuring the safety of the drinking water. The Mayor, Council, and the Director of Public Works represent the Owner and Veolia carries out the operation of the Drinking Water Systems in accordance with all regulatory and QMS requirements.

Veolia Water Canada appoints personnel to assume the roles of Top Management and QMS Representative as they relate to the Operating Authority. This is presented to the Owner for their approval.

The roles and responsibilities pertaining to the Operating Authority personnel as they relate to drinking water quality and the QMS are summarized in the Organizational Structure, Roles, Responsibilities and Authorities document.

The Operating Authority shall keep the description of the organizational structure current including respective roles, responsibilities and authorities, and shall communicate this information to Operating Authority personnel and the Owner.

Top Management or their designate will ensure Management Reviews are conducted and communicated to the Owner on a regular basis.



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**9.5 ASSOCIATED DOCUMENTS**

- E9 - Veolia Organizational Chart
- E9 - Township of Huron-Kinloss Organizational Chart
- E9 - Job Description and Orientation

**9.6 REFERENCE MATERIALS**

None applicable



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## 10. Element 10- Competencies

### 10.1 PROCEDURE DESCRIPTION

To provide a method to identify the competencies required for personnel performing duties directly affecting drinking water quality and the activities in place to meet those competencies.

### 10.2 REASON FOR PROCEDURE

To ensure the necessary competencies of these personnel are developed, documented and monitored, and to ensure employees are aware of the relevance of their duties and how they impact safe drinking water.

### 10.3 DEFINITIONS

*Competency*: the demonstrated ability of an employee to apply their knowledge, understanding, skills, professional behaviour, and techniques in performing their duties and responsibilities. Competency is assessed through a combination of background (education, training and experience) and their actions performing assigned responsibilities.

### 10.4 PROCEDURE

The level of competency required for personnel who may directly affect drinking water is itemized in the Competency/Training Requirements associated document. These requirements are based on the organizational structure, roles, responsibilities, and the job description associated. All legislative and regulatory requirements have been factored into the competencies listed.

Appropriate training and development opportunities will be provided to meet the requirements, where necessary. Training may be provided internally or by an external agency, as appropriate. To maintain the necessary staffing level, certain requirements may be deviated from, at the Project Manager's discretion upon hiring new or transferred candidates. They may be deviated from provided they are not a regulatory requirement for a specific function.

A Training Record Form is required to be filled out for all Operators attending a training session. This form includes the date, description of the course/session, length of time, CEUs received and the Operator and Instructor signatures. The Training Form is then forwarded to the Compliance Coordinator and this information is recorded on the Employee Training Matrix. The completed Training Record Form is filed by the Office Manager. The Employee Training Matrix is maintained electronically and is filed in the Veolia Google Drive by the Compliance Coordinator.

Competencies will include factors such as leadership, decision making, cooperation, communication, analyzing situations, learning, applying knowledge, creativity, flexibility,



planning, following directions, customer satisfaction focus, adapting to change, handling pressure, and being results focused.

Competencies are evaluated annually through Veolia Performance Reviews conducted for all full time employees. This Performance Review includes key assessment factors, performance goals and objectives, a Health and Safety discussion, and a personal development plan. As part of the Performance Review, competencies and training records will be reviewed and necessary training and updates will be provided as part of the goals and objectives portion of the review for each staff member's upcoming year.

Performance Reviews are conducted by the Project Manager responsible for the employee and signed off by the Area Manager. Copies of completed Reviews are retained by the Project Manager, Area Manager, and the employee.

Awareness of the importance of employee responsibilities and their impact on drinking-water quality will be promoted through the following activities:

- 1) Communication and review of relevant legislative and regulatory requirements
- 2) Communication and review of roles and responsibilities relevant to the QMS detailed in Element 9
- 3) Regular review and updates of relevant policies and procedures, and
- 4) Communication and review of relevant competency requirements

Veolia Water Canada may administer certain tests, conduct interviews, verify references and/or request specific documentation as part of the hiring process in order to confirm skills, experience and knowledge to ensure competency of the Operations staff.

## 10.5 ASSOCIATED DOCUMENTS

DWQMS Quiz  
QMS - Longterm Spreadsheet  
E4 - QMS Orientation Checklist  
E12 - Training Record Form

## 10.6 REFERENCE MATERIALS

Employee Training Matrix  
Training Record Form



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## 11. Element 11 - Personnel Coverage

### 11.1 PROCEDURE DESCRIPTION

To identify how the Township of Huron-Kinloss and Veolia Water ensure that competent personnel are available to fulfill the responsibilities needed for the ongoing operation of its Drinking Water Systems and its Quality Management System (QMS).

### 11.2 REASON FOR PROCEDURE

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

### 11.3 DEFINITIONS

None Applicable

### 11.4 PROCEDURE

The Drinking Water System Operators utilize one shift Monday through Friday and report daily to the Project Manager and the Director of Public Works. Table 11.1 provides the schedules for the Operations staff. The Operators are required to be included in a 7-day on-call rotation (Tuesday AM - Tuesday AM). With respect to the four (4) water systems, there is only one On-Call Operator. This Operator is equipped with an on-call phone that has access to the SCADA system to address alarms, and a response time of 1 hour is required to attend to any after-hours alarms if deemed necessary by the Operator.

On weekends, there is an Operator whose responsibility is to perform daily pumphouse checks and report any anomalies or unusual occurrences to the On-Call Operator and/or Project Manager or Overall Responsible Operator (ORO).

If additional Operators are required to assist during an After-Hours call-out, it is at the discretion of the Project Manager to assign appropriate staff for this task. It is the responsibility of the Project Manager to ensure personnel coverage is available at all times for the water systems. This includes scheduled shifts, on-call coverage and any emergency situation.

If the On-Call Operator has specific questions related to operations, their initial contact is the ORO and/or the Project Manager. If additional services are needed (i.e. well technician, tree removal, snow plow, etc.), the Operator should contact the Director of Public Works in addition to the Project Manager.

The On-call Schedule for the Operators is mutually agreed upon and uploaded into the Veolia Google Calendar.



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The Township of Huron-Kinloss After-Hours service receives calls and contacts the On-Call Operator to report the occurrence and provide pertinent information. All other alarms are generated by the SCADA system and on-site autodialers.



**Table 11.1**

<b>Position</b>	<b>Schedule</b>
Project Manager	7-day rotation
Overall Responsible Operator	7-day rotation
On-Call Operator (1)	7-day rotation
Water Operators (3)	08:00 - 16:30
Weekend Operator	04:30 - 09:30

**11.5 ASSOCIATED DOCUMENTS**

None applicable

**11.6 REFERENCE MATERIALS**

On-Call Schedule



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## 12 Element 12- Communications

### 12.1 PROCEDURE DESCRIPTION

To identify the method for communicating information related to the QMS Operational Plan to appropriate internal and external parties, including the public, and to outline the method for receiving and processing related communication.

### 12.2 REASON FOR PROCEDURE

To ensure all applicable procedures that apply to internal and external communication related to the Township of Huron-Kinloss QMS are completed as required.

### 12.3 DEFINITIONS

None Applicable

### 12.4 PROCEDURE

*Internal Communication:* The QMS Operational Plan is available on the Veolia Google Drive (cloud-based platform) to all Veolia employees who have access to the Veolia Drive, and select members of the Township of Huron-Kinloss who have been granted access.

For all new Drinking Water System staff, QMS awareness training will be provided by the QMS Representative. Existing Drinking Water System staff will be notified of all significant changes made to the QMS.

Internal training sessions will be organized as required by the QMS Representative. New staff will be trained within three months of hire, and existing staff will receive quarterly DWQMS refresher training. The QMS Representative will identify and review all applicable QMS documentation and ensure that required personnel understand the content pertaining to their specific functions. Attendance will be mandatory for all staff directly involved with the QMS and will be documented through the Training Record Form.

Communication between the Operating Authority and the Owner will be managed by the QMS Representative. Information documented as a result of the Management Review Meetings will be forwarded to the Owner in the form of a formal Management Review Summary Report that includes details such as updates on progress and actions taken pertaining to the Drinking Water System and the QMS.



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*External Communication:* The QMS Operational Plan including the Policy, Statement of Commitment and Endorsement and its associated Elements will be communicated to the public via the Township of Huron-Kinloss website. The QMS and the Policy will also be communicated to all essential suppliers and service providers by letter or during the formal tendering process. Signed confirmation letters are returned from essential suppliers or service providers to acknowledge awareness.

*Responsibility:* The QMS Representative will be responsible for ensuring that the QMS related information is communicated to the appropriate internal and external parties.

## 12.5 ASSOCIATED DOCUMENTS

E12 - Training Record Form

E12 - Essential Supplies and Services - Letter to Provider - BLANK

## 12.6 REFERENCE MATERIALS

None applicable



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## 13. Element 13- Essential Supplies and Services

### 13.1 PROCEDURE DESCRIPTION

This procedure ensures suppliers and service providers meet all requirements of the Township of Huron-Kinloss and Veolia Water Canada, to provide safe and reliable drinking water to the residents and businesses within the Township.

### 13.2 REASON FOR PROCEDURE

To ensure suppliers and service providers meet all Township and applicable regulatory requirements and to provide an effective monitoring protocol after selection through a contract or single purchase.

### 13.3 DEFINITIONS

*Essential Supplies and Services:* goods and people coming in from outside the Drinking Water System that can introduce risks to the quality and safety of the drinking water and are necessary to providing safe drinking water.

### 13.4 PROCEDURE

Township of Huron-Kinloss staff are required to follow Schedule "A" of *By-Law 2014-68 - Purchasing and Procurement Policy* when ordering or acquiring supplies and services. Veolia staff are required to follow the most current version of the *VNA Policy and Procedure PC\_100 - Procurement*. A list of Essential Supplies and Services is maintained to ensure the supply of safe drinking water.

Assurance of the quality of Essential Suppliers and Services is achieved through documentation of applicable accreditation, licences, certification and associated regulations and standards, as they apply, to be listed under the Quality Requirements of the Essential Suppliers and Services Table. These are to be reviewed for currency on an annual basis.

All suppliers of essential supplies and services will be provided with a Supplier Letter and a Communications Confirmation along with the Purchase Order or Capital Project issued for their work by the Township of Huron-Kinloss or Veolia Water Canada. This will serve to provide them with the Township's QMS Policy and ensure that they are aware and meet the Township's requirements. It is preferable that the communication package be returned prior to initially commencing work/delivery. Signed copies will be valid for a period of one calendar year before another Communications Confirmation form will need to be signed. Administration/Purchasing staff will determine whether a more current signed copy is required prior to issuing any new Purchase Orders.



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A review of the suppliers and service providers will be completed on an annual basis by the Project Manager, Operator-in-Charge, Administration Staff, and the QMS Representative.

**13.5 ASSOCIATED DOCUMENTS**

- E13 - Essential Suppliers and Services Table
- E12 - Essential Supplies and Services - Letter to Provider - BLANK

**13.6 REFERENCE MATERIALS**

- Township of Huron-Kinloss Schedule "A" of By-Law 2014-68
- VNA Policy and Procedure PC\_100 Procurement



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## 14. Element 14- Review and Provision of Infrastructure

### 14.1 PROCEDURE DESCRIPTION

This procedure describes the infrastructure review activities and how funding is provided to ensure system rehabilitation and renewal (see also Element 15 - Infrastructure Maintenance, Rehabilitation, and Renewal).

### 14.2 REASON FOR PROCEDURE

An annual review of the drinking water infrastructure ensures that the necessary facilities, process equipment and supporting services are in place and capable of operating the Drinking Water System safely and effectively. The results of the review are used to prioritize future resource allocation.

### 14.3 DEFINITIONS

None Applicable

### 14.4 PROCEDURE

The QMS Representative shall include a summary of the Infrastructure Review, in collaboration with the Operators, the Director of Public Works, and the Project Manager, in the Management Review.

The Infrastructure Review shall be conducted in accordance with the QMS Infrastructure Review Procedure, and be completed at least annually, usually in conjunction with the Capital Budget planning process and Management Review. This process reviews performance and maintenance and analyzes progress made from the previous year along with the outcomes of the Risk Assessment. This review collects input from Veolia staff, Township staff, MECP Inspection Reports, flow data trends, water quality reports, monthly summaries, maintenance records and the Financial Plan to determine priority needs.

To ensure the Township has the appropriate funds for Infrastructure projects including maintenance, renewal, rehabilitation, or upgrades, the Capital Budget Program allots funds from the Water and Wastewater Reserve, Development Charges Reserve, and Provincial and Federal Government funding where available. The Township is responsible for reviewing water use rates and fees annually. Where appropriate, increases are proposed to ensure that costs for capital, operation, maintenance and improvements are covered.

All employees share responsibility to communicate system concerns and/or opportunities for improvement to the Project Manager, ORO, QMS Representative, and/or the Director of Public Works.





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**14.5 ASSOCIATED DOCUMENTS**

E14 - Review and Provision of Infrastructure

E20 - Management Review - Template

**14.6 REFERENCE MATERIALS**

Township of Huron-Kinloss Asset Management Plan





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## 15. Element 15- Infrastructure Maintenance, Rehabilitation and Renewal

### 15.1 PROCEDURE DESCRIPTION

This procedure outline and defines the process of managing the maintenance, rehabilitation and renewal (MRR) of drinking water system infrastructure within the Township of Huron-Kinloss, which is comprised of the following 6 subsystems:

- 1) Lakeshore DWS
- 2) Courtney Subdivision Distribution System (ACW)
- 3) South Lucknow Distribution System (ACW)
- 4) Ripley DWS
- 5) Lucknow DWS
- 6) Whitechurch DWS

Operational maintenance requirements of the subsystems are carried out during the year with annual money provided through the operations budgets for preventative and unscheduled maintenance. Unscheduled maintenance required funds greater than supplied through the operating budgets is requested through Council for emergency funds.

Rehabilitation and Renewal which requires more planning and larger expenditures, is conducted by funds provided through Capital allocation.

Infrastructure summaries are to be kept current and up to date through the Township's asset management planning efforts.

### 15.2 REASON FOR PROCEDURE

This procedure will ensure the required MRR components are in place to address all issues that directly affect the drinking water quality of the system.

### 15.3 DEFINITIONS

*Planned Maintenance:* scheduled or proactive activities required for maintaining or improving infrastructure elements. The objective of planned maintenance is to reduce unplanned failures within the water system.

*Rehabilitation:* the process of repairing and/or refurbishing an infrastructure component.

*Renewal:* the process of replacing the infrastructure components with new components.

*Unplanned Maintenance:* reactive activities and may include such things as responding to main breaks, analyzer or sensor failures or mechanical failures. Unplanned failures may draw more



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heavily on resources, may adversely affect the water quality, and reduce consumer and owner confidence.



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## 15.4 PROCEDURE

This procedure will be divided into subheadings under i) Maintenance and ii) Rehabilitation and Renewal, and will describe the MRR of each subsystem individually.

### i) Maintenance

#### PROCEDURE DESCRIPTION

This procedure describes the maintenance activities performed within the Drinking Water System including scheduled maintenance (planned) and unscheduled maintenance (unplanned).

#### REASON FOR PROCEDURE

Maintenance activities significantly impact the equipment required to produce and distribute potable water. An effective maintenance program will reduce the overall Drinking Water System costs, improve drinking water quality and uniformity and result in increased consumer confidence. The Ministry of the Environment, Conservation and Parks (MECP) also requires equipment to be maintained according to the manufacturer's recommendations (Operation and Maintenance manuals).

#### RESPONSIBILITY

All staff who are directly involved in the supply of drinking water share in the responsibilities of maintaining and contributing to the continual improvement of the Drinking Water System.

The Director of Public Works is responsible for the overall operation, maintenance, planning, and review of the Drinking Water Systems.

The Operator-in-Charge (OIC) is responsible for the day to day operations of the Drinking Water Systems and provides updates to the ORO, the Project Manager, QMS Representative, and the Director of Public Works.

#### Planned Maintenance

Planned maintenance activities are assigned using electronic work orders that are generated through the maintenance software program *Jbs Plus* by the Compliance Specialist or designate. Open work orders identify the maintenance tasks to be completed. The Operator who is assigned to the work order is responsible to record observations, comments and concerns regarding the equipment and/or maintenance activity, document any parts that are consumed, sign off and submit the completed work order to the Compliance Specialist or designate for entry into *Jbs Plus*.



The Compliance Specialist or designate will regularly monitor the progress of the work orders and issue reminders to the Operators if the work orders are delinquent. The information reported on the work orders may be used for budget planning and preparation of the Infrastructure Review, Management Review, and Annual and Summary Report.

Planned maintenance items include, but are not limited to:

- Valve turning
- Hydrant flushing and maintenance
- Well inspections
- Reservoir and elevated storage facility inspections
- Chemical feed system maintenance
- On-line monitoring equipment maintenance
- High lift pump and well pump maintenance

### **Unplanned Maintenance**

Unplanned maintenance will be communicated to the Project Manager, ORO, QMS Representative, and Director of Public Works, and is coordinated by the Operators and/or contractors within normal operation budgets and purchasing limits.

If the equipment breakdown or failure constitutes a potential emergency, Emergency Management procedures in Element 18 shall be followed.

Staff is required to complete and submit a Corrective Maintenance work order to the Compliance Specialist or designate, with copies being distributed to the Office Manager (for billing purposes) and the Owner. Any observations, comments or concerns regarding the equipment and/or maintenance activity shall also be recorded on the Corrective Maintenance work order.

Unplanned maintenance items include, but are not limited to:

- Watermain breaks, valve or fire hydrant failures
- Pump failures
- On-line monitoring equipment failures
- Weather-related damages

## **ii) Rehabilitation and Renewal**

### **PROCEDURE DESCRIPTION**

Replacement of aging process equipment, upgrades and expansions required for the Drinking Water System and aging in-ground infrastructure required for the Water Distribution and



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Supply Subsystems are evaluated and compiled by the Director of Public Works, and summarized in the Township's Asset Management Plan.



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## REASON FOR PROCEDURE

As equipment and infrastructure ages, the requirement for rehabilitation and renewal due to failures, efficiency and capacity related issues becomes a necessity. Due to the large costs associated, a plan must be in place to ensure funds are available. As well as the costs associated, coordination of such projects requires many hours to plan, develop and implement prior to the work being completed.

## RESPONSIBILITY

The following persons are responsible for the rehabilitation of and renewal planning required with the systems:

- 1) Director of Public Works
- 2) Project Manager
- 3) Overall Responsible Operator
- 4) All Operators

## PROCEDURE

Using the “Forecasted Capital Requirements” in the Asset Management Plan and continuous monitoring of the maintenance programs, annual Capital Budget submissions are developed and submitted to Council for approval for the following year. Upon budget approval, the MRR proceeds following the appropriate Purchasing and Procurement Policy.

All employees are responsible to identify and communicate infrastructure issues, concerns and opportunities for improvement to management for review. This may occur through monthly summaries, staff meetings, annual reports or corrective action work orders.

### 15.5 ASSOCIATED DOCUMENTS

E14 - Review and Provision of Infrastructure  
E20 - Management Review - Template  
Google Drive: Annual and Summary Reports  
Google Drive: Annual and Summary Report Tracker Spreadsheet  
Google Drive: Annual and Summary Report Data - HK Spreadsheet  
Jbs Plus Work Order - Template  
Corrective Maintenance Work Order - Template

### 15.6 REFERENCE MATERIALS

Township of Huron-Kinloss Asset Management Plan  
Element 18 - Emergency Management Procedures



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## 16. Element 16- Sampling, Testing and Monitoring

### 16.1 PROCEDURE DESCRIPTION

This procedure outlines the sampling, testing and monitoring programs that are conducted for drinking water quality within the Drinking Water Systems.

### 16.2 REASON FOR PROCEDURE

To ensure sampling, testing and monitoring is conducted to provide safe drinking water for the Township of Huron-Kinloss Drinking Water Systems.

### 16.3 DEFINITIONS

None Applicable

### 16.4 PROCEDURE

The Township of Huron-Kinloss is responsible for establishing and maintaining a Sampling, Testing and Monitoring program that, at a minimum, meets regulatory requirements.

The sampling program was developed to ensure that the sample locations used are in areas that are representative of the drinking water provided to the residents, and that an adequate number of samples are collected on a regular basis. Some areas have been provided with fixed sample stations to allow for ease of sampling.

The sampling program and its associated documents are detailed in the Operations Manuals for each of the Drinking Water Systems.

Certified Operators perform all regulatory sampling requirements. They also conduct daily grab samples for on-line analyzer comparison and treatment optimization. Distribution sampling for chlorine residuals and flushing of dead end mains (as necessary) is also part of the program.

All bacteriological and chemical testing required for regulatory compliance is conducted by accredited laboratories.

All regulatory monitoring requirements are either carried out by the certified Operators and by the SCADA monitoring software program (e.RIS).

Regulatory reporting is completed as required and is available to all members of the public upon request.



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Sample test reports from the accredited laboratory are emailed to the Owner, Compliance Specialist, ORO, Project Manager, Office Manager, and the on-call email.

The test results are compiled into the Annual Report Data Spreadsheet by the Compliance Specialist/ORO.

Any Adverse Drinking Water Quality Incidents (AWQIs) are reported as per O. Reg. 170/03 outlined in the Operations Manuals.

## **16.5 ASSOCIATED DOCUMENTS**

E16 - Sampling, Testing and Monitoring Summary Tables (all sites)

Google Drive: SGS Laboratory Chain of Custody - Template

Google Drive: Annual and Summary Report Tracker Spreadsheet

Google Drive: Annual and Summary Report Data - HK Spreadsheet

AWQI Form 2 - Notice of Adverse Water Test Results and Issue Resolution

## **16.6 REFERENCE DOCUMENTS**

Operations Manuals

Contingency Plans





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## 17. Element 17- Measurement and Recording Equipment Calibration and Maintenance

### 17.1 PROCEDURE DESCRIPTION

This procedure describes the method used by the Township of Huron-Kinloss to ensure that all measurement and recording equipment is calibrated and maintained.

### 17.2 REASON FOR PROCEDURE

Accuracy of measurement and recording equipment is essential to providing quality drinking water to the consumer with confidence that the characteristics of the water meet or exceed the regulatory requirements.

### 17.3 DEFINITIONS

None Applicable

### 17.4 PROCEDURE

This procedure is applicable to the following types of equipment in use at facilities operated by the Township of Huron-Kinloss:

- Instrumentation equipment including flow metering and level sensing
- On-line continuous chlorine residual analyzers
- Pocket Chlorine analyzers
- Pocket Turbidimeters
- pH pocket testers

The Operator shall conduct, where required, calibration and maintenance of all continuous monitoring and recording equipment, including portable hand held devices applicable to their individual subsystems. These calibrations shall be recorded into the corresponding logbook or tracking logsheets.

Work orders from the *Jbs Plus* maintenance software are generated and issued to the Operators to indicate when calibration of continuous monitoring equipment is required.

The frequency of calibration shall at a minimum meet the regulatory requirements or the manufacturer's recommended calibration requirements if the frequency is greater.

### 17.5 ASSOCIATED DOCUMENTS

Google Drive : Annual Calibration of Analyzers





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**17.6 REFERENCE MATERIALS**

Operations Manuals



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## 18. Element 18- Emergency Management

### 18.1 PROCEDURE DESCRIPTION

This procedure describes the events and risks of the Township of Huron-Kinloss Drinking Water Systems that are considered emergencies, as well as those responsible for managing the response and recovery measures.

### 18.2 REASON FOR PROCEDURE

To establish an effective and organized response procedure that relates to emergencies directly related to the safety of the Drinking Water Systems.

### 18.3 DEFINITIONS

*Emergency (relating to the Township of Huron-Kinloss):* situations or impending situations caused by forces of nature, an accident, or an intentional act that constitutes a danger of major proportions to life and property.

*Emergency (relating to the Drinking Water Supply Systems):* a potential situation or service interruption that may result in the loss of the ability to maintain an adequate supply of safe drinking water to consumers.

### 18.4 PROCEDURE

The Township of Huron-Kinloss will utilize the risk assessment process to identify potential emergencies and consider specific emergency preparedness requirements. By assessing risks against process or practice, instances that may or may not exceed the acceptable risk threshold will be identified as risks that require the need for appropriate controls and an emergency preparedness plan. These risks and emergency conditions will be evaluated and categorized into degrees of severity with most severe being Emergency Response Procedures (ERP), then Contingency Plans (CP) and the least severe being Standard Operating Procedures (SOP). This occurs during the risk assessment group review sessions. The assessments will be reviewed annually to ensure accuracy of the procedures.

**Risk Assessments:**

- Lakeshore Drinking Water System (includes Courtney Subdivision)
- Lucknow Drinking Water System (includes South Lucknow)
- Ripley Drinking Water System
- Whitechurch Drinking Water System



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An Emergency Contact List, along with the CPs, ERPs and SOPs, for each system is available to ensure the effective response to any emergency event. All of these documents will be reviewed and updated periodically or as emergency conditions are assessed and categorized.



Emergency Response Testing is conducted annually in the form of a table-top scenario or the review of an actual emergency event. In case of an actual event, an After Action Report/Improvement Plan report is completed in collaboration with all applicable staff involved. The contents of the Operations Manuals and Contingency Plans may be reviewed and updated to reflect the appropriate measures taken to address any emergencies. The certified Operator on duty for each system must be capable of identifying and be prepared for responding to any emergency condition that may arise in any of the Drinking Water Systems.

In the event of an identified major emergency (relating to the Township of Huron-Kinloss Emergency Response Plan), the ORO responsible for the system shall be contacted immediately. After assessing the severity, the ORO will contact the Owner (Director of Public Works) and Project Manager. The Director of Public Works is designated as the lead representative of the Operating Authority and will be responsible for all major emergencies and will dictate the overall management, decision making and communications.

The Mayor and Council along with the CAO and Fire Chief (where required) shall be notified in the event that water cannot be supplied to the Drinking Water System(s) in sufficient amounts for fire protection. The Mayor and Council along with the CAO shall be notified in the event that water quality poses an acute health risk to customers and a Boil Water Advisory or Drinking Water Advisory must be issued. The Mayor and Council, as well as the CAO, Fire Chief and the Director of Public Works, will be primary contacts for all required communication with the public during these emergencies. The Director of Public Works will be responsible for making the notification if deemed necessary.

For continual improvement, a debriefing of any major event may be conducted if there were areas of improvement required.

## **18.5 ASSOCIATED DOCUMENTS**

Google Drive: After Action Reports  
QMS - Longterm Spreadsheet  
E7 - Risk Assessments (all sites)

## **18.6 REFERENCE MATERIALS**

Township of Huron-Kinloss Emergency Management Plan  
Operations Manuals  
Contingency Plans



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Emergency Response Planning Guide - 2017 - Washington State DOH



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## 19. Element 19- Internal Audits

### 19.1 PROCEDURE DESCRIPTION

This procedure defines the process used by the Township of Huron-Kinloss to conduct Internal Audits of the Drinking Water Quality Management System for all the Drinking Water Systems.

### 19.2 REASON FOR PROCEDURE

Internal Audits are conducted to confirm that the QMS meets or exceeds the requirements of the Ministry of the Environment, Conservation and Parks (MECP) Drinking Water Quality Management Standard (DWQMS), that the QMS is operating effectively and to identify opportunities for improvement.

### 19.3 DEFINITIONS

Corrective Action: actions taken to identify the root cause of a problem and apply actions to fix the identified problem.

System Non-Conformance: a system non-conformance is considered where:

- A procedure is not being followed as prescribed
- Objective evidence is not sufficient to support a claim that a procedure is followed accordingly, or
- The Operational Plan does not meet the requirements of the DWQMS.

### 19.4 PROCEDURE

It is the responsibility of the QMS Representative, that the audits are conducted in accordance with this procedure and frequencies required.

Internal Audits shall only be conducted by persons approved by the QMS Representative and having one of the following qualifications:

- A staff member who has completed Internal Audit training
- Employees of other Operating Authorities who have completed Internal Audit Training
- Non-qualified Auditors are permitted to assist an Auditor for the purpose of training and employee development.

At a minimum, Internal Audits shall be conducted once every calendar year. The audit frequency shall be increased for elements where a previous Internal or External Audit has identified either a major non-conformance or a series of minor non-conformances at the discretion of the QMS Representative. The scope of the Internal Audit includes all Management Systems and Operations that are applicable to the Drinking Water Systems that fall under the scope of the QMS.





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It is the responsibility of the Internal Auditors to conduct these audits in a thorough and professional manner, document results, identify opportunities for improvement and communicate the results to all parties involved in the Audit and the QMS Representative within 2 weeks of completing an Audit.

All Internal Audits shall be completed and a report generated prior to the annual Management Review Meeting.

Upon receipt of a non-conformance, the QMS Representative will follow the Root Cause Analysis Procedure/Fish-Bone Diagram and the root cause results and recommended actions to resolve the non-conformance by using the Root Cause Analysis Form.

An Audit will consist of the following phases:

- Audit preparation
- Conducting the Audit
- Reporting and follow-up,

and shall be completed according to the QMS Internal Audit Procedure.

## 19.5 ASSOCIATED DOCUMENTS

E19 - Internal Audit Report and Checklist

QMS - Longterm Spreadsheet

E19 - Root Cause Analysis - Fishbone Diagram - Template

E19 - Root Cause Analysis (5-Why) - Blank Report Form

## 19.6 REFERENCE DOCUMENTS

Drinking Water Quality Management Standard



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## 20. Element 20- Management Review

### 20.1 PROCEDURE DESCRIPTION

This procedure defines the process by which the Quality Management System (QMS) is reviewed by utilizing the Management Review Committee.

### 20.2 REASON FOR PROCEDURE

Management reviews are conducted to assess and ensure the continuing suitability, adequacy and effectiveness of the QMS. In addition, the review provides a forum to support continuous improvement.

### 20.3 DEFINITIONS

None applicable

### 20.4 PROCEDURE

This procedure is applicable to the Township of Huron-Kinloss Management, Veolia staff, and the Drinking Water Systems and activities that fall under the scope of the QMS.

A full Management Review shall be conducted at every calendar year, following completion and reporting of the year's Internal Audit. Top Management is responsible for ensuring that the review is conducted and conforms to the procedure.

Management Review Meetings shall include the following participants:

- QMS Representative
- Director of Public Works
- Project Manager
- Administrative Assistant - Public Works
- Operator(s)
- Participants added at the discretion of the Management Review participants

The QMS Representative is responsible to report to Top Management on the performance of the QMS and any need for improvement. This is provided through a Draft Management Review Summary Report/Agenda.



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The QMS Representative shall be responsible to prepare a Draft Management Review Summary Report/Agenda and issue copies prior to the Management Review Meeting to all participants. This Draft Report/Agenda shall have the following information:

- A. Incidents of regulatory non-compliance
- B. Incidents of adverse drinking water tests
- C. Deviations from Critical Control Point Limits and response actions
- D. The effectiveness of the Risk Assessment process
- E. Internal and Third-Party Audit results
- F. Results of emergency response testing
- G. Operational performance
- H. Raw water supply and drinking water quality trends
- I. Follow-up on Action Items from previous Management Reviews
- J. The status of Management Action Items identified between Reviews
- K. Changes that could affect the Quality Management System
- L. Consumer feedback
- M. The resources needed to maintain the Quality Management System
- N. The results of the Infrastructure Review
- O. Operational Plan currency, content and updates, and
- P. Staff suggestions.

For the Management Review Meeting, the following topics shall be presented:

- A review of the raw water supply and drinking water quality trending
- A review of the Drinking Water System's flows and capacities
- Any changes to Source Water Protection within the Drinking Water Systems
- A review of the Annual and Summary Reports
- Any changes to Best Management Practices and related initiatives (continual improvement)
- Any directions or considerations published by the Ministry of the Environment, Conservation and Parks, World Health Organization, Local Health Units, Emergency Management Ontario, etc..

For all deficiencies identified during the Meeting, the Management Review participants may identify any Action Items and/or Action Plans, personnel responsible for implementation, and timeframes of Action Items required. Alternatively, deficiencies may be addressed by initiating Corrective Actions.

After the Management Review Meeting, any comments, recommendations, changes, plans, etc.. shall be documented in the Final version of the Management Review Summary Report, and copies are then circulated to the participants as a record of the Meeting Minutes.



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The QMS Representative shall be responsible for communication and implementation of the Management Review Action Items. The Final Management Review Summary Report shall be made available to Mayor and Council after all items have been addressed, as required.



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## 20.5 ASSOCIATED DOCUMENTS

QMS - Longterm Spreadsheet

E14 - Review and Provision of Infrastructure

E20 - Management Review

E18 - After Action Report/Improvement Plan

## 20.6 REFERENCE MATERIALS

Drinking Water Quality Management Standard



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## 21. Element 21 - Continual Improvement

### 21.1 PROCEDURE DESCRIPTION

The Township of Huron-Kinloss will maintain its established Drinking Water Quality Management System by regular review and continual improvement.

### 21.2 REASON FOR PROCEDURE

To continually improve the effectiveness of the Quality Management System through the use of corrective actions.

### 21.3 DEFINITIONS

*Best Management Practice (BMP):* a program, process or procedure which, if implemented, may assist the Owner and Operating Authority of a Drinking Water System to deliver safe, high quality drinking water; provide mechanisms to optimize efficiencies within the Drinking Water System and/or QMS, and provide information to assist in future planning for the systems.

*Corrective Action:* an action to eliminate the cause of a detected Non-Conformity with QMS, with the requirements of the DWQMS, or other undesirable situations.

*Management Review Action Items (AI):* Action Items identified formally through Element 20 - Management Review process.

*Non-Conformance (NC):* the non-fulfillment of a DWQMS requirement.

*Opportunities for Improvement (OFI):* improvement suggestions.

*Preventive Action:* an action to prevent a non-conformity from occurring.

### 21.4 PROCEDURE

With the use of tools such as Document Change Requests, Corrective Action Requests and Preventative Action Requests, the Township of Huron-Kinloss will modify, update and/or adjust processes and procedures (while remaining in compliance with MECP regulations) to improve operations and customer satisfaction. The review of Best Management Practices (BMPs) at least once every 36 months (including checking the Ministry's Best Practices webpage) will be completed in conjunction with the annual Management Review process.

The QMS Representative will be responsible for maintaining the OFI Tracking Sheet, along with the Preventative and Corrective Actions Tracking Sheet, and Management Review Action Item Tracking Sheet. Preventative and Corrective Actions and OFIs may stem from the Internal and External Auditing process, MECP Drinking Water Inspections, Management Review and staff



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suggestions and ideas. OFIs will be discussed, evaluated and ultimately implemented as necessary.



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## 21.5 ASSOCIATED DOCUMENTS

Google Drive: OFI Tracking Sheet

Google Drive: Annual and Summary Report Tracker Spreadsheet

Google Drive: Annual and Summary Report Data - HK Spreadsheet

## 21.6 REFERENCE MATERIALS

None applicable





## REVISION HISTORY

Revision	Date	Summary of Changes	Revised by
15	May 19, 2022	Whole document; Added/changed grammar, replaced E4-QMS Representative Orientation Checklist with E4-QMS Orientation Checklist, removed Drawings Control Table, changed name of QMS-Schedule with QMS-Longterm Spreadsheet, removed TOMRMS, added BG abandoned March 2022, changed status of BG, updated raw water characteristics and PTTW, updated stats, added Courtney Subdivision and South Lucknow, removed CCP 18 from Lakeshore, replaced Administrative Support with Compliance Coordinator, removed Huronville Subdivision from Element 15, replaced Annual and Summary Report Data Tracking Spreadsheet with Annual and Summary Report Tracker spreadsheet, added Annual and Summary Report Data - HK spreadsheet, replaced competent with certified, changed E3 lab with SGS Lab, removed QMS Emergency Management Training Procedure, added Revision History	NM
14	Oct 27, 2020	Format change from word to Google Docs, consolidation of OP into one document, removal of Appendices - replaced with reference to Associated Documents, removed glossary of terms, added introduction, updated signatures and QMS Rep info, updated system descriptions, risk assessment outcomes/CCLs/CCPs, changed references to location of documents (Veolia Office has relocated), created many associated documents in Google format	NM
13	Jun 11, 2019	Review and updates	NM
12	July 26, 2018	Rev to Plan (Elements and Appendices)	NM
11	Jun 12, 2018	Rev to Jun 12, 2018 Annual Review and update to 2.0 Standard	CG
10	May 29, 2017	Updates to table of contents, Element 10, Appendix A1, A2, I1 and M1 from Annual Review	CB
9	Apr 25, 2017	Updates to Elements 11, 13 and 21, and addition of Appendix N1 and N2 from Internal Audit	CB
8	Mar 23, 2017	Updates to Appendix I1, E2 and E3 from Internal Audit	CB
7	Feb 21, 2017	Updates from Appendix E1, F1 and F2 from Internal Audit	CB
6	Dec 7, 2016	Updates to Element 4 from Internal Audit	CB
2	Jun 30, 2015	Revisions for Re-Accreditation Audit	DCS
1	Jun 4, 2013	Revisions for Re-Accreditation Audit	DCS
—	Apr 20, 2009	Release	DCS