



The Municipality of Port Hope

**QMS Operational Plan
146 – 401**

in compliance with

Drinking Water Quality Management Standard



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Revision History

Revision	Description of Change	Author	Effective Date (mm/dd/yy)
0	Initial Release	Rick Trumper	08/24/09
1	Revision of Element 4 - Update of Section 4-1 Activity Description of Element 4 QMS Rep. to reflect the appointment of the Environmental Compliance Technician as QMS Representative. (pg. 4-1)Revisions of Element 6 - Update of the Municipality of Port Hope water treatment and distribution system description (pg.6-1 to 6-2). Update of the Process Flow Chart – Port Hope Drinking Water System (pg.6-3). Revision of Table of Contents (pg. ii to v)	Beata Odziemkowska	01/25/10
2	Revision of Disclaimer Statement (pg. i) - updated with correct title of Water System ERP. Revision to Element 6 – Update of Section 6-2, subsections 6.2.2, 6.2.3 and 6.2.5. Revision of Element 12 – Update to Section 12-2 to reflect methods of internal communication and QMS Policy public communication. Revision of Element 18 – Updated with correct title of the Water System ERP document	Beata Odziemkowska	03/12/10
3	Revision to Element 6 – Update of Section 6-2 and subsection 6.2.5 – reservoir capacity corrected	Beata Odziemkowska	07/18/11
4	Operational Plan number 146 – 401 added throughout the document	Beata Odziemkowska	06/04/12
5	Section 6 – updated Zebra mussels temperature; Section 12 – updated to reflect current communication protocol;	Beata Odziemkowska	12/04/13
6	Full review of entire OP for content - new font and logo used; El. 20 – Added CAO to the attendees list;	Beata Odziemkowska	09/24/14
7	Full review of entire OP for content – replaced CAO with Executive Director where applicable; El.6 – updated Process Flow Chart; updated Table 6-1;	Beata Odziemkowska	08/05/15
8	Removed the Executive Director position throughout the document;	Beata Odziemkowska	11/04/15
8.1	Full review – minor changes: updated municipal logo; added “QMS” to “Operational Plan” throughout the document;	Beata Odziemkowska	08/18/16

1. Quality Management System

1-1 Objectives and Scope

The objectives of the Municipality of Port Hope's Quality Management System (QMS) are:

- Ensure the effective management and operation of the water system
- Understand and control the risks associated with activities and processes related to the water system
- Achieve continuous improvement of the QMS and the water system performance

The QMS Operational Plan applies to all activities, processes, and practices related to the provision of safe drinking water by the Municipality of Port Hope.

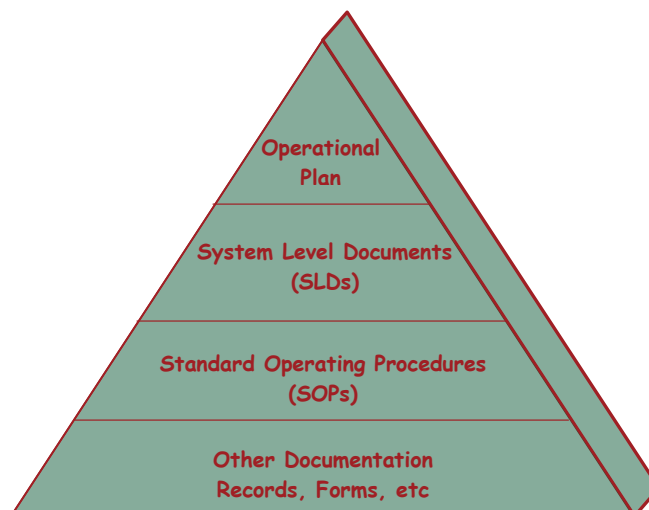
1-2 Activity Description

The QMS Operational Plan defines and documents the Quality Management System (QMS) for the Municipality of Port Hope Drinking Water System which is owned and operated by the Municipality of Port Hope. It sets out the policies and procedures with respect to quality management in accordance with the requirements of the Province of Ontario's Drinking Water Quality Management Standard (DWQMS).

The numbering of the sections of the QMS Operational Plan directly corresponds to the numbering of the elements of the DWQMS.

Figure 1 below illustrates the documentation structure of the Municipality's QMS. This "Documentation Pyramid" is based on four levels. It is important to note that not all 21 elements of the DWQMS require four levels of documentation (i.e. all information related to some DWQMS elements might be fully contained within the first or second levels of documentation). The four documentation levels are explained below.

Figure 1 – DWQMS Documentation Pyramid





1.2.1 QMS Operational Plan

The QMS Operational Plan presents an overview of the QMS and makes reference to all applicable System Level Documents (SLDs), Standard Operating Procedures (SOPs), reference documents, records, etc, as they relate to the 21 elements of the DWQMS. This document contains:

- Statement about the Municipality's commitment to quality
- The Quality Management System Policy
- Information about responsibilities of personnel for quality related processes
- References to other quality documents not contained in the QMS Operational Plan
- High-level information about key areas of the quality system and the overall operation of the Municipality's drinking water system.

1.2.2 System Level Documents

System Level Documents (SLDs) as indicated in Figure 1, describe who is responsible for completing the described procedure, when is the procedure applicable, what documentation is needed, etc. SLDs may also refer to other procedures that contain more specific information.

1.2.3 Standard Operating Procedures

Standard Operating Procedures (SOPs) detail how an activity is carried out, specifying the tools and materials (if any), locations, specific steps, etc.

1.2.4 Other Documentation

This documentation level includes all records and documentation required to demonstrate compliance of the drinking water QMS and to track performance. These records document the results of activities carried out following SLDs and SOPs. Records include work orders, calibration records, water quality test results, etc.

1-3 Associated System Level Documents

Not Applicable

1-4 References

Drinking Water Quality Management Standard – Element 1



2. Quality Management System Policy

2-1 Objectives and Scope

The Quality Management System Policy (QMS Policy) establishes the principles and commitments of the Municipality of Port Hope with regards to their Quality Management System (QMS), as related to the drinking water system.

The QMS Policy is the foundation of the QMS and it relates to all activities, processes, and practices involved in the provision of safe drinking water by the Municipality of Port Hope.

For information regarding the approach by which the QMS Policy will be communicated to all stakeholders, refer to Section 12 of the QMS Operational Plan, Communications.


2-2 Activity Description



The Municipality of Port Hope shall provide safe drinking water that is compliant with the Safe Drinking Water Act and applicable regulations and legislation.

We are committed to:



-  **P**rovide safe drinking water
-  **O**bey all applicable legislation and regulations
-  **R**evise, maintain and continually improve
-  **T**reat and produce water that is clean and reliable
-  **H**old the highest standards of quality
-  **O**perate in an environmentally responsible manner
-  **P**rovide a sustainable drinking water system
-  **E**ducate the public about importance of water

2-3 Associated System Level Documents

Not Applicable

2-4 References

Drinking Water Quality Management Standard – Element 2



3. Commitment & Endorsement

3-1 Objectives and Scope

This statement establishes the commitment by Top Management of the Operating Authority and the Owner to the implementation and maintenance of an effective Quality Management System (QMS), as related to the drinking water system. It refers to the QMS and all activities associated with its implementation and maintenance as described in the QMS Operational Plan and related documentation.

3-2 Activity Description

The Municipality of Port Hope is committed to ensuring that the QMS is developed and implemented for the Municipality’s drinking water system in accordance with the requirements of the Drinking Water Quality Management Standard. The Owner and Top Management are committed to ensuring that the established QMS complies with all applicable legislation and regulations and that all resources required for the maintenance and continual improvement of the system are identified and provided. They are also committed to ensuring that the Operating Authority is aware of all applicable legislative and regulatory requirements governing the provision of safe drinking water. To promote awareness and understanding of the QMS, the Municipality of Port Hope’s QMS will be communicated to relevant parties according to the procedures outlined in Section 12 of the QMS Operational Plan, Communications.

This QMS Operational Plan is endorsed and supported by the Owners and Top Management of the Municipality of Port Hope Drinking Water System.

_____	_____
Mayor – Robert J. Sanderson “Owner Representative”	Date
_____	_____
Executive Director – Sue Bernardi “Top Management”	Date
_____	_____
Director of Works & Engineering – Peter Angelo, P.Eng “Top Management”	Date

3-3 Associated System Level Documents

Not Applicable

3-4 References

Drinking Water Quality Management Standard – Element 3



4. Quality Management System Representative

4-1 Objectives and Scope

The QMS Representative is responsible for the upkeep of the QMS as well as ensuring that staff are aware of all applicable legislative and regulatory requirements relevant to their duties regarding the provision of safe drinking water. The description below details the QMS Representative's roles and responsibilities.

4-2 Activity Description

The Environmental Compliance Technician has been appointed the QMS Representative by the Municipality of Port Hope. The QMS Representative is authorized and responsible for managing all processes and procedures associated with the management of the QMS. The QMS Representative will report to Top Management on the performance of the QMS and continual improvement activities. Section 21 of this Operational Plan, Continual Improvement, details the Municipality's continual improvement activities. Clear communication channels between Top Management and the QMS Representative are required to deal with issues as they arise.

The QMS Representative will ensure that current versions of documents related to the QMS are in use. The procedures outlined in Section 5 of the Operational Plan, Document and Records Control will be used to ensure that all personnel have access to the most current versions of all required procedures and documents.

It is the responsibility of the QMS Representative to promote awareness of the QMS to all Port Hope Drinking Water System personnel. The QMS policies and procedures will be presented to personnel during internal training sessions, internal audits, and management review meetings. All training sessions, internal audits, and management review meetings will be coordinated by the QMS Representative.

A detailed description of the roles and responsibilities of the QMS Representative is included in Section 9, Organizational Structures, Roles, Responsibilities and Authorities.

4-3 Associated System Level Documents

Not Applicable

4-4 References

Drinking Water Quality Management Standard – Element 4



5. Document and Records Control

5-1 Objectives and Scope

This Section outlines the procedures followed to ensure that documents and records pertaining to the provision of safe drinking water are maintained and controlled.

5-2 Activity Description

Procedures for documents and records control have been established to describe the methods and activities for ensuring that documents and records are properly managed. These are included in System Level Documents *SLD 05A – Control of Documents* and *SLD 05B – Control of Records*.

5-3 Associated System Level Documents

SLD 05A – Control of Documents

SLD 05B – Control of Records

5-4 References

Drinking Water Quality Management Standard – Element 5



6. Drinking Water System

6-1 Objectives and Scope

This Section presents an overview of the main components of the Port Hope Drinking Water System.

6-2 Activity Description

The Port Hope Drinking Water System is owned and operated by the Municipality of Port Hope. The system supplies water to the community of Port Hope for combined residential, commercial, industrial, and institutional use. The system is divided into two zones and its water infrastructure consists of a Class 2 Water Treatment Plant and Class 3 Water Distribution System.

6.2.1 Water Source

The Port Hope Water Treatment Plant obtains its raw water from Lake Ontario. Lake Ontario is considered to be a source of good quality surface water with minor seasonal variations in turbidity levels. Spring runoff discharged from the Ganaraska River into the lake and turbulence caused by storm events in the spring and fall can impact the raw water quality on an intermittent basis.

A 750 mm diameter raw water intake pipe extends 896 metres into the lake and terminates at a concrete intake crib at a depth of approximately 9 metres. A Zebra Mussel control system is installed at the entrance of the intake.

6.2.2 Treatment

The Port Hope Water Treatment Plant (WTP) has a capacity of processing 20,000 m³/day. The low lift pumping station pumps raw water from Lake Ontario via a 750 mm diameter intake pipe to two screening systems (stationary and travelling), following which the water is pumped via three (3) low lift pumps to two (2) micro-strainers. The low lift pumps are rated at 15,000 m³/d; with total discharge head (TDH) of 22.5 m. The WTP has provisions to add chlorine at the intake to minimize operational problems associated with potential biological growth on the filters.

The WTP processes consist of the membrane filtration and disinfection using chlorine gas. The plant utilizes the Zenon's ZeeWeed ZW1000 Ultrafiltration Membrane technology, which eliminates the traditional coagulation, flocculation and conventional filtration processes. The raw water is filtered using ultrafiltration membrane modules. This process step removes bacteria, pathogens, and viruses including cryptosporidium and Giardia. There are four membrane filtration tanks; each contains two membrane cassettes with additional capacity of two more cassettes to be added to each tank. The membrane surfaces are cleaned by back-pulsing intermittently throughout the filtering process to remove any accumulated particulates. Additional cleaning of the membranes includes daily cleaning/maintenance cycle and also more rigorous clean-in-place process, as needed.



6.2.3 Chemicals Addition

Primary disinfection is achieved by the addition of chlorine gas to the filtered water, which is referred to as permeate. A dual cell contact tank provides sufficient contact time (CT) for the disinfection. The CT value required for primary disinfection is provided by two serpentine baffled chlorine contact chambers. Treated water then flows into two on-site storage reservoirs prior to being pumped by the high lift pumps (HLP) to the distribution system. The high lift pumping facility consists of five (5) vertical turbine high lift pumps, HLP 1 is rated at 5,500 m³/d at 80m TDH, HLPs 2 and 4 are rated at 10,000 m³/d at a TDH of 80 m, HLPs 3 and 5 are rated at 15,000 m³/d at a TDH of 80m, which feeds the distribution system. Additional chlorine is added to the treated water prior to leaving the plant, prior to the high lift pumping station, to achieve sufficient chlorine residual throughout the distribution system (secondary disinfection).

Process wastewater from various plant processes is discharged into a common backwash water pipe which conveys the wastewater into two wastewater equalization tanks and then, the wastewater is pumped to the wastewater clarifiers for further treatment. At this point of treatment, a polymer solution can be added if needed to assist in the floc formation. As the wastewater is being transferred into the clarifiers, the clarification/separation process takes place whereby the sludge settles to the bottom and the clarified fraction of the wastewater (supernatant) is allowed to overflow the clarifier via a weir arrangement. The settled sludge is pumped to the sanitary sewage pumping station and the clarified supernatant is discharged into Lake Ontario. Prior to a discharge to Lake Ontario, sodium bisulphite is added to the supernatant to neutralize any chlorine present in the supernatant.

6.2.4 Monitoring

The treated, raw and permeate water flow rates throughout the plant are monitored by magnetic flow meters while online analyzers continuously monitor chlorine residuals, turbidity and particle size/count; all online analyzers are programmed with predetermined alarm set-points. The drinking water system is controlled and continuously monitored at all times. Data from the meters and monitors is continuously uploaded to a Supervisory Control And Data Acquisition (SCADA) system, which allows operators to monitor and control the treatment processes within the plant and also the distribution system. Computers contain specialized software and various types of measuring and monitoring equipment provide a constant status of the drinking water system to the certified operators who maintain it. The SCADA system is programmed to automatically respond to process adjustments and alarms. Coverage is assured through a telecommunications system that notifies the on-call Operator in Charge (OIC) of any condition within the drinking water system that requires attention.

6.2.5 Distribution System

The distribution system is divided into two (2) zones, Zone 1 and 2. Zone 1 is located in the eastern portion of the community and includes a 1,082 m³ Standpipe. The Dorset Street Standpipe provides storage and also regulates pressure in Zone 1 area.

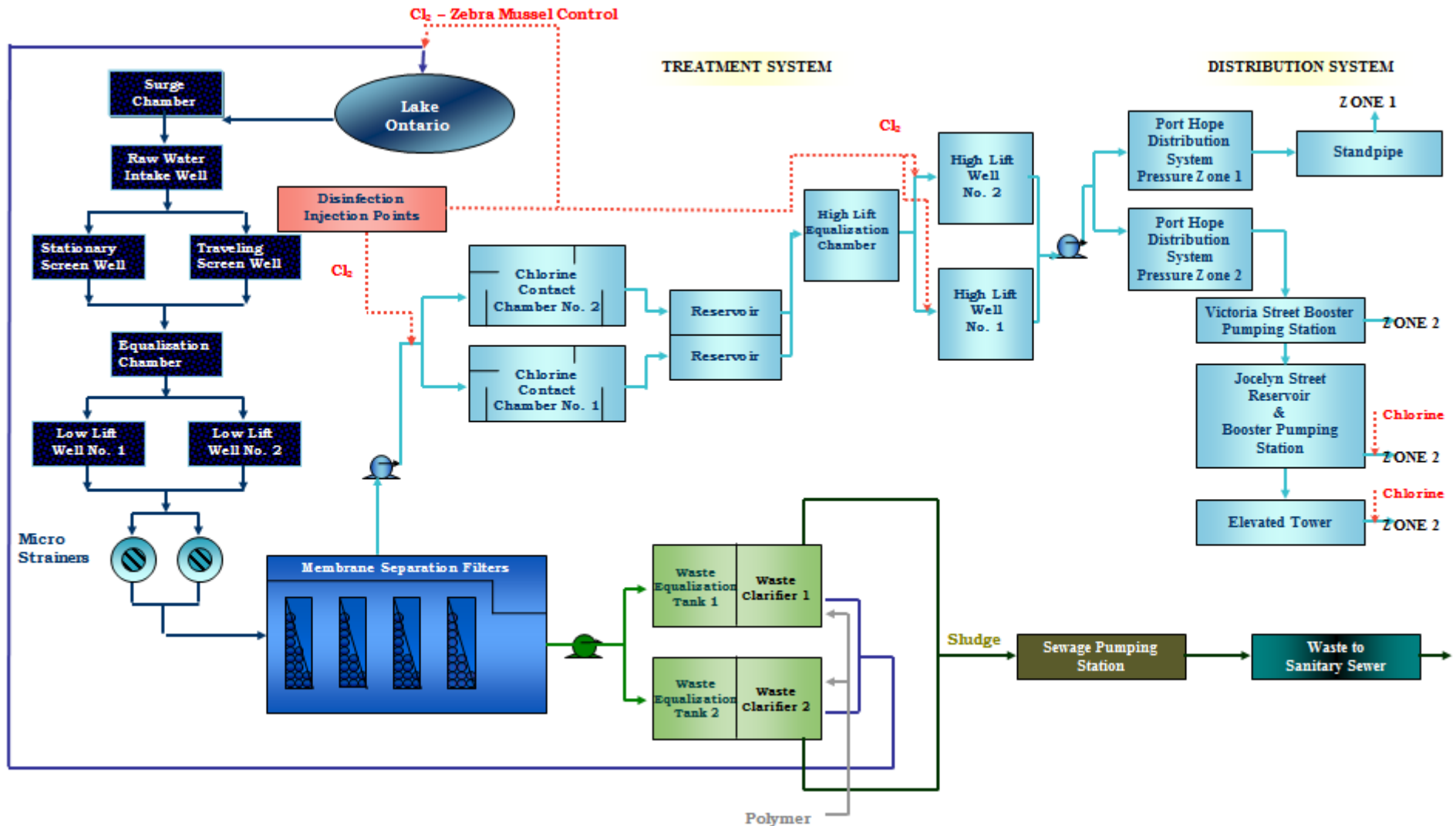


Zone 2 encompasses the more elevated lands to the west and includes a 2,270 m³ reservoir, a 3000 m³ elevated water tank, and two (2) booster stations to maintain system pressures to ensure that it remains within the MOECC guidelines, and also to provide storage. The Victoria Street Booster Station and the Jocelyn Street Reservoir maintain system pressure and flow rates in the Zone 2 area. On-line chlorine analyzers continuously monitor chlorine levels in the Fox Rd. elevated water tank and in the Jocelyn Street Reservoir where additional chlorine can also be added when required.

The above description is presented graphically in the following Process Flow Chart.



Process Flow Chart – Port Hope Drinking Water System





The general characteristics of the raw water are described in the *Port Hope Water Treatment Plant Operations Manual* and listed below in Table 6-1.

Table 6-1: Selected Raw Water Quality Parameters

Parameter*	2009 - 2013		
	Minimum	Maximum	Average
Alkalinity (as CaCO ₃)	84	98	89
Aluminum	<0.010 (MDL)	0.029	0.021
Chloride	23	25	24
Colour (TCU)	<3 (MDL)	<3 (MDL)	<3 (MDL)
Copper	<0.002 (MDL)	0.009	0.005
Dissolved Organic Carbon	1.8	2.9	2.3
Ethylbenzene	<0.00033 (MDL)	<0.00033 (MDL)	<0.00033 (MDL)
Hardness (as CaCO ₃)	113	126	120
Iron	0.011	0.035	0.021
Manganese	<0.0002 (MDL)	0.0020	0.0014
Methane (L/m3)	<0.006 (MDL)	0.007	<0.006 (MDL)
Odour	Occasional odour problems from Geosmin and MIB during summer		
Organic Nitrogen	0.14	0.34	0.23
PH (pH units)	7.97	8.31	8.06
Sodium	12.6	14.3	13.4
Sulphate	24	26	25
Sulphide	<0.004 (MDL)	<0.006 (MDL)	<0.006 (MDL)
Taste	Occasional taste problems from Geosmin and MIB during summer		
Toluene	<0.00036 (MDL)	<0.00036 (MDL)	<0.00036 (MDL)
Total Dissolved Solids	160	189	172
Xylenes	<0.00039 (MDL)	<0.00043 (MDL)	<0.00043 (MDL)
Zinc	<0.002 (MDL)	0.007	0.005

*all results are expressed in mg/L, unless specified otherwise

MDL – Method Detection Limit (< indicates that concentration was less than MDL value indicated)

The following may pose operational challenges and threats:

- Zebra Mussel infestation - Zebra Mussels are prevalent throughout the rivers and lakes of southern Ontario. If not controlled, Zebra Mussels multiply and grow rapidly. They have been known to block intakes, intake pipes and screens within one season. Zebra Mussels only become active and begin feeding and breeding when the water temperature approaches 8°C to 12°C (normally June to September – depending on a year);



- Stormy weather leading to raw water turbidity above 5 NTU;
- Presence of algae in raw water leading to elevated turbidity;
- Contamination from sewage.

There are no critical upstream or downstream processes that are relied upon to ensure the provision of safe drinking water.

A more detailed description of the water treatment and distribution system is included in the *Port Hope Water Treatment Plant Operations Manual*.

6-3 Associated System Level Documents

Not Applicable

6-4 References

Drinking Water Quality Management Standard – Element 6

Port Hope Water Treatment Plant Operations Manual



7. Risk Assessment

7-1 Objectives and Scope

This Section refers to the methodology and approach taken by the Municipality of Port Hope to identify, assess, and where possible, mitigate and/or eliminate potential risks within the drinking water system.

The Risk Assessment applies to the entire drinking water system within the Municipality of Port Hope. The focus of the assessment is on risks affecting the water quality and water quantity (capacity).

7-2 Activity Description

A risk assessment process has been established to collectively identify, assess, rank, and prioritize potential drinking water related hazards and associated risks. This risk assessment process is conducted once every 3 years. A review of the validity of the risk assessment information is conducted on a yearly basis.

The methodology and approach taken to conduct the risk assessment are described in detail in *SLD 07 – Risk Assessment and Risk Assessment Outcomes*.

7-3 Associated System Level Documents

SLD 07 – Risk Assessment and Risk Assessment Outcomes

7-4 References

Drinking Water Quality Management Standard – Element 7



8. Risk Assessment Outcomes

8-1 Objectives and Scope

This Section describes the approach taken by the Municipality of Port Hope to document the outcomes of the risk assessment activities undertaken according to the risk assessment procedures outlined in Section 7, Risk Assessment.

8-2 Activity Description

The results of the risk assessments are documented in the *Port Hope Water Treatment Plant Risk Assessment Table*, the *Port Hope Water Distribution System Risk Assessment Table*, and the *Port Hope Critical Control Points Table*. These tables are maintained in accordance with the guidelines identified in Section 5, Document and Records Control. The risk assessment tables include all identified hazards and hazardous events, their assessed risk values, and existing control measures to prevent or mitigate them.

8-3 Associated System Level Documents

SLD 07 – Risk Assessment and Risk Assessment Outcomes

8-4 References

Drinking Water Quality Management Standard – Element 8

Port Hope Water Treatment Plant Risk Assessment Table

Port Hope Water Distribution System Risk Assessment Table

Port Hope Critical Control Points Table



9. Organizational Structure, Roles, Responsibilities and Authorities

9-1 Objectives and Scope

This section outlines the organizational structure, as well as the roles, responsibilities, and authorities of personnel that relate to the operation and performance of the Municipality's QMS as related to the drinking water system. This Section and all associated procedures apply to all personnel of the Municipality involved in the provision of safe drinking water.

9-2 Activity Description

The structure of the Operating Authority and roles and responsibilities of personnel, as they relate to provision of safe drinking water, are included in *SLD 09 – Organizational Structure, Roles & Responsibilities*.

9-3 Associated System Level Documents

SLD 09 – Organizational Structure, Roles & Responsibilities

9-4 References

Drinking Water Quality Management Standard – Element 9



10. Competencies

10-1 Objectives and Scope

This Section and associated procedures identify how the Municipality of Port Hope ensures that personnel responsible for the provision of safe drinking water, remain competent.

10-2 Activity Description

SLD 10 – Competencies includes the procedure to ensure that staff who is involved in the provision of safe drinking water meet and maintain their competency requirements.

10-3 Associated System Level Documents

SLD 10 – Competencies

10-4 References

Drinking Water Quality Management Standard – Element 10



11. Personnel Coverage

11-1 Objectives and Scope

This Section relates to the procedures followed to ensure that competent individuals are available to fulfill the responsibilities needed for the ongoing operation of the drinking water system, and the maintenance of the Municipality's QMS, as related to the drinking water system.

11-2 Activity Description

The Director of Works and Engineering with assistance from the Water Operations Manager will ensure that competent personnel are available at all times to fulfill the required duties for the provision of adequate and safe drinking water within the Municipality. This includes ensuring that positions requiring back-up personnel have an appropriate number of qualified and competent replacements, and that employees have access to all the tools and resources needed to perform their roles. The procedures are detailed in *SLD 11 – Personnel Coverage*.

11-3 Associated System Level Documents

SLD 11 – Personnel Coverage

11-4 References

Drinking Water Quality Management Standard – Element 11



12. Communications

12-1 Objectives and Scope

This Section describes the process of communicating information on the Municipality's drinking water QMS to appropriate internal and external parties.

12-2 Activity Description

12.2.1 Internal Communication

The QMS Operational Plan is made available to all Municipality of Port Hope personnel involved in the provision of safe drinking water including new, part-time, temporary, and student employees. A hardcopy of the QMS Operational Plan is available from the QMS Representative. An electronic copy of the QMS Operational Plan is available on the internal network.

For new hires, QMS awareness training will be provided by the QMS Representative. Existing employees are notified of any changes to the QMS using one of the following methods as appropriate: information sessions, meetings, circulation of documents, e-mails, and postings on the internal network. Internal training sessions are also conducted to review QMS documentation to ensure that personnel understand the content. Attendance is documented through sign-on sheets.

Communication between the Operating Authority personnel and Top Management is managed by the QMS Representative in regards to QMS related issues.

Communication between Top Management and the Owner occurs as part of regular Council meetings. Information documented as a result of Management Review meetings (see Section 20, Management Review) is forwarded by Top Management to the Owner in the form of a formal report that includes details such as updates on QMS progress and actions taken. The QMS Representative is responsible for ensuring that the Owner has access to a current copy of the QMS Operational Plan.

12.2.2 External Communication

Suppliers and Service Providers

The QMS Policy and the quality requirements for supplies and services are communicated to the suppliers and service providers during tender processes.

The QMS Policy for the Municipality's drinking water system will be forwarded to the suppliers and service providers as appropriate by email, fax or hard copy.

Public

The QMS Policy, Statement of Commitment and Endorsement, and the QMS Operational Plan are available to the public via the Municipality of Port Hope's website, or by other means upon request. The QMS Policy is posted at the municipal offices and other municipal facilities.



Additional special communication procedures are detailed in other QMS Operational Plan sections if applicable.

12-3 Associated System Level Documents

Not Applicable

12-4 References

Drinking Water Quality Management Standard – Element 12



13. Essential Supplies & Services

13-1 Objectives and Scope

This Section and associated procedures apply to all supplies and services considered essential to the supply of safe drinking water for the Municipality of Port Hope.

13-2 Activity Description

SLD 13-Essential Supplies and Services describes and references methods for:

- Procuring essential supplies and services
- Establishing and communicating quality expectations
- Ensuring quality expectations are met

For all supplies and services related to the supply of safe drinking water, staff shall attempt, where possible, to multi-source and have an established, pre-approved supplier on-call in case of emergency.

More detailed information is included in *SLD 13 – Essential Supplies and Services*.

13-3 Associated System Level Documents

SLD 13 – Essential Supplies and Services

13-4 References

Drinking Water Quality Management Standard – Element 13



14. Review and Provision of Infrastructure

14-1 Objectives and Scope

This Section relates to the procedure for reviewing the adequacy of the existing and planned drinking water infrastructure needed to ensure an adequate supply of safe drinking water.

14-2 Activity Description

The review of the adequacy of existing drinking water system infrastructure to supply safe drinking water for the Municipality of Port Hope is conducted following the procedures outlined in *SLD 14 – Infrastructure Management*. The results and corresponding recommendations of the infrastructure review are communicated to Top Management and the Owner through the Management Review process (see Section 20, Management Review).

14-3 Associated System Level Documents

SLD 14 – Infrastructure Management

14-4 References

Drinking Water Quality Management Standard – Element 14



15. Infrastructure Maintenance, Rehabilitation and Renewal

15-1 Objectives and Scope

This Section identifies the maintenance, rehabilitation, and renewal programs that the Municipality of Port Hope has in place for its drinking water system infrastructure.

15-2 Activity Description

The Municipality of Port Hope's infrastructure management program outlines scheduled activities to ensure all essential drinking water system infrastructure is maintained in good working order. *SLD 14 – Infrastructure Management* details the processes and activities conducted to ensure the adequacy of the infrastructure, including the maintenance, rehabilitation, and renewal/replacement programs that are in place. The summaries of these programs are communicated to Top Management and the Owner through the Management Review process (see Section 20, Management Review).

15-3 Associated System Level Documents

SLD 14 – Infrastructure Management

15-4 References

Drinking Water Quality Management Standard – Element 15



16. Sampling, Testing & Monitoring

16-1 Objectives and Scope

This Section refers to the sampling, testing, and monitoring program for drinking water quality that is currently in place for the Municipality of Port Hope's drinking water system. This Section and associated procedures apply to all sampling and testing conducted either internally or by a third-party.

16-2 Activity Description

The Municipality of Port Hope is responsible for establishing and maintaining a regular sampling, testing, and monitoring program that, at a minimum, meets regulatory requirements. Sampling and monitoring activities carried out by the Municipality can be categorized as follows:

- Regulatory sampling, testing, and reporting;
- Special testing.

The procedures followed for each of these categories are detailed in *SLD 16 – Sampling, Testing and Monitoring*.

Personnel will be made aware of the sampling, testing, and monitoring requirements through internal training sessions (see Section 12, Communications).

16-3 Associated System Level Documents

SLD 16 – Sampling, Testing and Monitoring

16-4 References

Drinking Water Quality Management Standard – Element 16



17. Calibration of Sampling, Testing and Monitoring Equipment

17-1 Objectives and Scope

This Section describes the calibration programs for all water sampling, monitoring and testing equipment and devices.

These procedures apply to all devices, tools or equipment used for the purposes of taking water samples and conducting water quality testing, and monitoring water treatment and distribution processes to ensure continuous provision of safe drinking water.

17-2 Activity Description

The following instruments, tools, devices and equipment are used for sampling and testing activities:

- Chlorine Residual Analyzers
- Pressure Transmitters
- Turbidimeters
- Flow Meters
- pH Meters

Each item is uniquely identified by a serial number either on the item itself or on its container. The calibration procedure and frequency of calibration for each piece of equipment, device, instrument or tool is outlined in *SLD 17 – Instrument Calibration*.

17-3 Associated System Level Documents

SLD 17 – Instrument Calibration

17-4 References

Drinking Water Quality Management Standard – Element 17



18. Emergency Preparedness and Response

18-1 Objectives and Scope

This Section describes the procedure used by all Municipality of Port Hope personnel involved in the provision of safe drinking water to identify emergency situations, and prepare response plans to deal with these emergency situations.

18-2 Activity Description

As an outcome of the risk assessment process (see Section 7, Risk Assessment and Section 8, Risk Assessment Outcomes) is the identification of potential emergencies that could impact the supply of safe drinking water. *SLD 18 – Emergency Preparedness* includes the appropriate procedures for preparedness, response, and recovery in case of emergency.

Employee training on emergency response is conducted on a yearly basis to ensure that established emergency procedures are well understood by those responsible for carrying out response activities. Through this training, the Municipality of Port Hope will ensure that all personnel involved in the provision of safe drinking water are aware of:

- Individual roles and responsibilities
- All relevant procedures
- Existing threats and hazards, and associated preventive actions
- Details and location of any emergency equipment required.

Training is in the form of desktop exercises, and where possible, mock emergency situation exercises. In the event of an actual emergency, the results of the response will be reviewed through the Management Review process (see Section 20, Management Review).

The Municipality of Port Hope Water System Emergency Response Plan contains a Master Contact List that includes an up-to-date list of emergency contacts. The list of emergency contacts has been developed to ensure that the appropriate individuals will be contacted in the event of an emergency and that the necessary actions are taken to respond to the situation. This list is reviewed on a yearly basis or as required to ensure that it remains current.

18-3 Associated System Level Documents

SLD 18 – Emergency Preparedness

18-4 References

Drinking Water Quality Management Standard – Element 18

The Municipality of Port Hope Water System Emergency Response Plan



19. Internal Audits

19-1 Objectives and Scope

This Section outlines the approach for conducting internal audits of the Municipality of Port Hope's drinking water QMS to ensure proper implementation and continual conformance to the requirements of the DWQMS.

19-2 Activity Description

The QMS Representative is responsible for ensuring that an internal audit takes place and for the following:

- Ensuring that an internal audit is scheduled on annual basis
- Ensuring an internal audit team is trained, competent, and readily available to conduct audits
- Ensuring that Top Management is informed if additional internal auditing resources are required
- Overseeing that system non-conformances are addressed and resolved in a timely manner by the internal audit team

The QMS Representative will ensure that the entire QMS is audited at least once every 12 months.

The procedure followed by the Municipality to conduct an Internal Audit is explained in *SLD 19 – Internal Auditing*.

19-3 Associated System Level Documents

SLD 19 – Internal Auditing

19-4 References

Drinking Water Quality Management Standard – Element 19



20. Management Review

20-1 Objectives and Scope

This Section outlines the process by which the performance of the QMS, as related to the drinking water system is periodically reviewed. This Section and associated procedures apply to all Management Review meetings related to the drinking water QMS and any documentation associated with these meetings.

20-2 Activity Description

At a minimum, one Management Review meeting will be conducted every twelve months to provide Top Management of the Municipality of Port Hope with the information required to review and evaluate the continued suitability, adequacy, and effectiveness of its QMS.

The QMS Representative is responsible for scheduling and coordinating the effort to bring the management team together for Management Review and ensure all the documentation and records required for this meeting are available.

At a minimum, the Director of Works and Engineering, Water Operations Manager and QMS Representative will attend the Management Review meeting.

All relevant personnel are made aware of the Management Review procedure through internal training sessions (see Section 12, Communications).

The procedure followed to conduct the Management Review is detailed in *SLD 20 – Management Review*.

20-3 Associated System Level Documents

SLD 20 – Management Review

20-4 References

Drinking Water Quality Management Standard – Element 20



21. Continual Improvement

21-1 Objectives and Scope

This Section outlines the processes by which improvements to the drinking water QMS are identified, developed, and implemented. The entire QMS, as related to the drinking water system is subject to the approaches and procedures identified in this section of the QMS Operational Plan.

21-2 Activity Description

The procedure for continual improvement is defined in *SLD 21 – Continual Improvement*. It identifies the approach taken to define and implement corrective and prevention actions that are required as a result of the internal auditing and Management Review processes (see Sections 19, Internal Audits, and Section 20, Management Review) or that are identified as the opportunities for improvement during regular operations.

21-3 Associated System Level Documents

SLD 21 – Continual Improvement

21-4 References

Not Applicable