



PORT COLBORNE

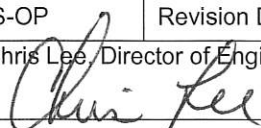
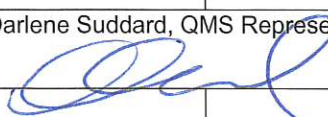
WATER DISTRIBUTION SYSTEM

Waterworks Number: 260001643

QUALITY MANAGEMENT SYSTEM OPERATIONAL PLAN

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PORT COLBORNE
Quality Management System
Operational Plan

A. INTRODUCTION

1. Purpose

The purpose of this Operational Plan is to document the Quality Management System (QMS) developed and implemented by the City of Port Colborne for the operation and maintenance of its water distribution system.

This Operational Plan includes references to all components of the Drinking Water Quality Management Standard.

2. Scope

This Operational Plan covers the activities and personnel associated with all operational aspects of the drinking water distribution system for the City, identified by waterworks number 260001643.

This Operational Plan, the procedures, work instructions and other DWQMS documentation that are referenced herein have been developed in accordance with the legislated requirements for the provision of safe drinking water in the Province of Ontario.

The application of this Plan, and associated procedures and work instructions begins at the point where treated water enters the watermain from the treatment facilities, and ends at the property lines of the consumers.

3. References

- Drinking Water Quality Management Standard, February 2017
- Safe Drinking Water Act, 2002 and applicable regulations

4. Definitions and Acronyms

CCL – Critical Control Limit

CCP – Critical Control Point

City – City of Port Colborne

DWQMS or Standard – Drinking Water Quality Management Standard

OIC – Operator-In-Charge

OP – Operational Plan

ORO – Overall Responsible Operator

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QMS – Quality Management System
QMS Rep – QMS Representative
Region – Regional Municipality of Niagara
PCDS– Port Colborne Distribution System

B. OPERATIONAL PLAN

1. Quality Management System

The City of Port Colborne has prepared this Operational Plan, in conformance with the DWQMS, to document the City’s commitment to providing clean, safe and reliable drinking water throughout the City’s water distribution system. The development and continual improvement of the OP will help ensure that all regulatory requirements are met and that consumers can be confident that their drinking water will be protected through the effective implementation of the QMS at the City.

2. Quality Management System Policy

The City of Port Colborne is committed to provide safe and reliable drinking water of high quality to the consumer. In particular, the City makes the following commitments:

- To provide safe and reliable drinking water to the consumer;
- To comply with, or exceed, applicable legislation and regulations;
- To implement, maintain, and continually improve the Quality Management System;
- To deliver excellent customer service through listening and communicating with the public regarding safe drinking water.

These commitments have been summarized in a poster, QMS-PP, provided in Appendix 1, which shall be displayed at City owned properties, and provided on the City’s website in order to inform water consumers of the City’s commitments.

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3. Commitment and Endorsement

The City of Port Colborne supports the implementation, maintenance and continual improvement of the drinking water QMS (Quality Management System) for the City of Port Colborne water distribution system, as described in the Operational Plan. The Owner (the Mayor and Council), endorses this Operational Plan through a Council Resolution within one (1) year following the election of a new Council, or following significant changes to the Operational Plan. Council's endorsement is provided in Appendix 2. Top Management (Director of Engineering and Operations), by signing below, acknowledges the need for a Drinking Water QMS and the responsibility for providing sufficient resources to maintain and continually improve the QMS.

Director of Engineering and Operations (Top Management)
Chris Lee

Date

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4. Quality Management System Representative

The City of Port Colborne has appointed and authorized the Environmental Compliance Supervisor as the Quality Management System Representative, who, irrespective of other duties, has the following responsibilities including, but not limited to:

- Ensuring that processes and procedures needed for the QMS are established and maintained,
- Reporting to Top Management on the performance of the QMS and any needed improvement,
- In cooperation with all Operating Authority staff, ensuring that current versions of documents required by the QMS are easily identified, retrievable and being used at all times,
- In cooperation with Operating Authority staff, ensuring that personnel are aware of all applicable legislative and regulatory requirements that pertain to their duties for the operation of the subject system;
- Promoting awareness of the QMS throughout the operating authority.

Additional responsibilities and authorities are detailed in Section 9.

5. Document and Records Control

Document and record control is an essential part of the QMS. To ensure all QMS documents and records are current, legible, identified and retrievable, a document and record control procedure has been developed and implemented:

Procedure QMS-SOP05-1 Document and Record Control

This procedure also details how QMS documents and records are stored, protected, retained and disposed of.

6. Drinking Water System

The City of Port Colborne is the Owner and Operating Authority of the Port Colborne Distribution System, which serves approximately 16,000 residents. The PCDS is a standalone, Class 1, distribution system, with no downstream connections, and obtains water from the Region, who is the owner and operating authority of the Port Colborne Drinking Water System, which consists of

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the Port Colborne Water Treatment Plant (WTP), the Fielden Avenue Reservoir, the Barrick Road Water Tower and trunk watermains. Treated water is purchased from the Region on a volume basis and distributed through the City owned distribution system via Region owned trunk mains.

The Region draws water from the Welland Canal, treats it at the WTP (using only sodium hypochlorite and aluminum sulphate, Liquid Polymer (Nalcolyte 8100), according to the Region's annual report), and is responsible for sampling, testing and monitoring water at and leaving the WTP.

The City of Port Colborne does not perform any secondary disinfection, as the WTP sufficiently chlorinates the water to meet the minimum requirement of >0.05 mg/L free chlorine residual. The City performs flushing activities on an as-needed basis to maintain free chlorine residuals throughout the PCDS. The distribution system has an average pressure of 58 psi, with pressure maintained by the Region's Barrick Road Water Tower together with the Fielden Avenue Reservoir. As a result, booster pumps are not required. A process flow chart showing the general movement of water through the City's PCDS is provided in Figure 6.1 below. The City and the Region have a Memorandum of Understanding, dated April 21, 2016, which details not only where ownership demarcation points are, but also detail water quality, supply, maintenance, mutual assistance, emergency response, customer complaints and communication requirements.

The description of the PCDS is updated when required.

7. Risk Assessment

The City assesses potential risks to the PCDS at scheduled intervals, as per the risk assessment process detailed in:

Procedure QMS-SOP07-1 Risk Assessment

This procedure also ensures that any changes to the PCDS are assessed to ensure any potential risks and CCP's are identified.

8. Risk Assessment Outcomes

A summary of Risk Assessment Outcomes are provided in Table 8.1: Risk Assessment Outcomes, in Appendix 3. As indicated on the Table, the identified CCP, and the CCL, where applicable, are addressed in:

Procedure QMS-SOP11-1 Personnel Shortage Contingency Procedure
Operational Procedure C1 Adverse Drinking Water Quality Incident Notification –Port Colborne Distribution System and Sherkston Community Centre Cistern System

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Operational Procedure	C2	<i>Repair of Watermain Breaks</i>
Operational Procedure	C5	<i>Corrective Action for Adverse Water Quality – Distribution System</i>
Procedure	QMS-SOP18-1	<u><i>Provision of Drinking Water in a Distribution System Emergency</i></u>

9. Organizational Structure, Roles, Responsibilities and Authorities

9.1 Organizational Chart

The organizational chart showing the Owner, Top Management and Operating Authority is provided in Figure 9.1: Drinking Water Responsibilities Organizational Chart, in Appendix 4.

9.2 Roles, Responsibilities and Authorities

Table 9.2: Roles, Responsibilities and Authorities

Mayor and Council (Owner)

<i>Responsibilities</i>	<i>Authorities</i>
Ultimate responsibility for ensuring the provision of safe drinking water. Other responsibilities related to the provision of safe drinking water are: <ul style="list-style-type: none"> • Provide resources and infrastructure necessary to comply with legislation. • Ensure compliance and proper accreditation according to the requirements of the Safe Drinking Water Act, Drinking Water Quality Management Standard and associated regulations. • Endorse the QMS 	<ul style="list-style-type: none"> • Financial and administrative authority relating to the distribution of safe drinking water.

Director of Engineering and Operations (Top Management)

<i>Responsibilities</i>	<i>Authorities</i>
Reporting to the system Owner, the Director of Engineering and Operations is the link between the system Owner and the Operating Authority. Other responsibilities related to the provision of safe drinking water are: <ul style="list-style-type: none"> • Request funding required to maintain system • Recommend improvements to system • Provide budgetary information to the Owner • Provide the Owner with technical and administrative information • Participate in Management Review 	<ul style="list-style-type: none"> • Create administrative and technical policy when necessary • Manipulate long term capital plan when necessary

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Manager of Operations (ORO)

<u>Responsibilities</u>	<u>Authorities</u>
<p>The Manager of Operations is the ORO for the PCDS and is responsible for the oversight of the system.</p> <ul style="list-style-type: none"> • <u>ORO duties as described in O. Reg 128/04</u> • <u>Ensure the system is operated in accordance with all applicable legislation and regulations</u> • <u>Ensure sufficient resources for Water Operator training</u> • <u>Ensure that Water Operators remain certified</u> • <u>Participate in Management Review</u> • <u>Staff hiring and evaluation</u> • <u>Approve payments for goods and services</u> • <u>Prepare operating budget submissions</u> • <u>Respond immediately and effectively to an emergency</u> • <u>Provide direction to the Utilities Supervisor and Operators with regard to operation and maintenance of the systems which meets or exceeds the requirements of all relevant legislation and regulations, and the City of Port Colborne's policies and procedures</u> • <u>Develops, directs and evaluates maintenance activities</u> 	<ul style="list-style-type: none"> • <u>ORO authority as described in O. Reg 128/04</u> • <u>Make suggestions to improve QMS and Operational Plan</u> • <u>Review and approve procedures and processes for assuring water quality</u> • <u>OIC Responsibilities</u> • <u>Delegate or appoint Acting ORO</u> • <u>Appoint Primary and Supplemental OIC(s)</u> • <u>Staffing for unionized and non-unionized positions in water department</u> • <u>Approval of expenditures as per corporate purchasing policy</u> • <u>Procurement of resources – staffing and materials in a distribution system emergency</u> • <u>Ensure delivery and quality of maintenance activities</u> • <u>Ensure adverse incidents addressed as per legislative requirements</u>

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Utilities Supervisor (Primary OIC, Acting ORO)

<i>Responsibilities</i>	<i>Authorities</i>
<p>The Utilities Supervisor is responsible for the day-to-day operation of the system.</p> <ul style="list-style-type: none"> • <u>Responsibilities as above when Acting ORO</u> • <u>OIC duties as described in O. Reg 128/04</u> • Ensure Water Operators are trained appropriately • Schedule staff • Oversee equipment calibration • Ensure submission of water samples to accredited laboratory • Ensure that Water Operators remain certified • Participate in Management Review • Participate in Infrastructure Review • <u>Assist with the preparation of operating and capital budget submissions</u> • <u>Development and review of procedures and processes for assuring water quality</u> • <u>Provide direction to Operators with regard to operation and maintenance of the systems which meets or exceeds the requirements of all relevant legislation and regulations, and the City of Port Colborne's policies and procedure</u> • <u>Recommend to the Manager of Operations ways to improve water quality and operational effectiveness</u> • <u>Ensure scheduled equipment maintenance is performed and output maintained</u> 	<ul style="list-style-type: none"> • <u>Authorities as above when Acting ORO</u> • <u>OIC authority as described in O. Reg 128/04</u> • Direct operators in day to day activities • Oversee adverse water quality incidents and reports • Directs maintenance activities • Make suggestions to improve QMS and Operational Plan • Order supplies as needed

Utilities Crew Leader (Supplemental OIC/backup Primary OIC)

<i>Responsibilities</i>	<i>Authorities</i>
<p>The Utilities <u>Crew Leader</u> is a class 1 Water Operator and OIC on a daily basis.</p> <ul style="list-style-type: none"> • OIC duties as described in O. Reg 128/04 • See Water Operators for additional responsibilities 	<ul style="list-style-type: none"> • OIC authority as described in O. Reg 128/04 • See Water Operators for additional responsibilities

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Water Operators (Supplemental OICs)

<i>Responsibilities</i>	<i>Authorities</i>
<ul style="list-style-type: none"> • <u>OIC duties as described in O. Reg 128/04 (Class 1 or higher Operators only – OITs ineligible for OIC designation)</u> • <u>Set operational parameters or direct or instruct other operators on same (When Supplemental OICs)</u> • <u>Drinking water tests</u> • Regular maintenance • Report any incidence of non-compliance • Respond to repairs to the system • Conduct regular checks on monitoring equipment • Input lab and sampling results into WaterTrax • Follow SOPs and QMS requirements • <u>Operate processes and equipment safely, in accordance with manuals</u> • <u>Make adjustments as needed</u> • <u>Complete and maintain records</u> • <u>Use and maintain equipment</u> 	<ul style="list-style-type: none"> • <u>OIC authority as described in O. Reg 128/04 (Class 1 or higher Operators only – OITs ineligible for OIC designation)</u> • Make suggestions to improve QMS, SOPs and Operational Plan

Construction Inspector

<i>Responsibilities</i>	<i>Authorities</i>
<ul style="list-style-type: none"> • Oversee, monitor and verify the work of contractors: <ul style="list-style-type: none"> • hired by the City to install watermains • installing private services/fire lines larger than 3 inches in diameter that connect to the City's distribution system • Conduct sampling to verify disinfection in accordance with watermain commissioning protocol 	<ul style="list-style-type: none"> • Authority to halt construction if the Contractor is not in compliance with any of the relevant specifications and/or procedures

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Environmental Compliance Supervisor (QMS Representative)

<i>Responsibilities</i>	<i>Authorities</i>
<p>The QMS Rep reports the current performance of the QMS to Top Management. In addition to the specific responsibilities outlined in Section 4, the QMS Rep is responsible for:</p> <ul style="list-style-type: none"> • Control and maintenance of documents and records • Facilitating Top Management reviews and the Risk Assessment process • Providing compliance related training to Water/Wastewater staff • Ensuring corrective <u>and preventive</u> actions are completed and maintained • Developing and maintaining the internal audit program 	<ul style="list-style-type: none"> • Report and recommend any resource needs in order to ensure conformance to the QMS • Create and update SOPs, make changes to the Operational Plan and QMS as needed. • Represent Port Colborne at Regional and Provincial meetings.

10. Competencies

Personnel competencies are listed in Table 10.1, with additional required knowledge, skills and abilities relevant to specific positions described in corporate job descriptions. Annual training activities are provided to ensure that personnel meet or exceed the minimum standards for annual training and continuing education hours, as established in O. Reg. 128/04, to maintain operator certification. Training is also provided, as required, to ensure other required competencies and certificates (i.e. First Aid) are maintained. All training records are maintained by the QMS Representative in an Excel spreadsheet.

Additionally, personnel receive refresher training in the QMS to ensure that they are aware of the relevance of their duties and how they affect safe drinking water. This training is conducted by the QMS Rep, who maintains records of the training, and is detailed in:

Procedure QMS-SOP12-1 Communications

Training effectiveness is evaluated.

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Table 10.1: Competency requirements for personnel whose duties directly affect the PCDS

Position	Required Competencies and Certificates	Desired Competencies*
<u>Manager of Operations (Designated ORO, non-union staff)</u> <u>Utilities Supervisor (Primary OIC, Acting ORO if Manager is absent, non-union staff)</u>	<ul style="list-style-type: none"> • Class 1 Water License • Valid DZ driver's license • First Aid/CPR • WHMIS • Confined space entry • QMS Awareness 	<ul style="list-style-type: none"> • Information Technology skills • Administrative skills
<u>Utilities Crew Leader (Supplemental OIC, Acting Primary OIC if Supervisor is absent, union staff)</u> Water Operators (Supplemental OICs, union staff)		
Construction Inspector (union staff)	<ul style="list-style-type: none"> • Proficient comprehension of engineering drawings, principles, construction procedures and standards • Knowledge of watermain installation & testing requirements in AWWA C651, DWWP, contract documents etc. • <u>Class 1 or OIT water license</u> • WHMIS • QMS Awareness 	

**Information Technology skills are defined as but not limited to skills dealing with e-mail, spreadsheets and database knowledge. Administrative skills are defined as but not limited to skills dealing with fellow employees, citizens and those contracted by the City. Administrative and Information Technology skills are obtained via practical experience with limited instruction.*

11. Personnel Coverage

The PCDS is staffed regularly Monday to Friday. Hours depend on time of year; 08:00 to 16:00 from August 31 to May 1 (approximate) and 07:00 to 15:00 from May 1 to August 31 (approximate). Schedules are set by the Utilities Supervisor. During regular operating hours, any PCDS issues are initially received by Operations administrative staff, who forward the information to the Utilities Supervisor. The Utilities Supervisor then directs the appropriate personnel to resolve the issue.

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The City's PCDS requires minimal staffing during off hours. However, if a situation does arise where more staff is required, the necessary information can be found contained within the On-Call List. Service calls during off hours are received by the On-call Supervisor/Crew Leader via an answering service. Once a call is received and the On-call Supervisor/Crew Leader determines it is a PCDS issue, a call is placed to the On-call Water Operator.

The Manager of Operations is the designated ORO for the PCDS. In the event the designated ORO is absent the Acting ORO is the Utilities Supervisor, as indicated in Table 10.1 above, and detailed in:

Port Colborne Distribution System Emergency Preparedness Plan

In the event of a personnel shortage, coverage is achieved as detailed in:

Procedure QMS-SOP11-1 Personnel Shortage Contingency Procedure

12. Communications

The QMS is communicated from Top Management to the Owner, OA personnel, suppliers and the public through a variety of methods, which have been detailed in:

Procedure QMS-SOP12-1 Communications

13. Essential Supplies and Services

Where applicable, supplies shall adhere to AWWA and ANSI standards. All laboratory analysis shall be conducted by accredited, licensed laboratories.

The water supply inventory is set with ordering points determining when supplies are ordered and the quantity required. Received orders are visually checked against the packing slip and then the packing slip is checked against the purchase order. The Utilities Supervisor shall further verify any ordered material that requires knowledge of water industry terminology.

PCDS supplies are available 24 hours a day, 7 days a week in the Stores Department at the Engineering and Operations Centre.

Supplies and services considered essential for the delivery of safe drinking water, and the procedure by which the City ensures their quality are detailed in:

Procedure QMS-SOP13-1 Essential Supplies and Services

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14. Review and Provision of Infrastructure

The City reviews the PCDS infrastructure once every calendar year to ensure the adequacy of the infrastructure necessary to operate and maintain the PCDS. The procedure for the review is detailed in:

Procedure QMS-SOP14-1 Review and Provision of Infrastructure

15. Infrastructure Maintenance, Rehabilitation and Renewal

The City addresses infrastructure maintenance, rehabilitation and renewal programs through three methods: planned maintenance, unplanned maintenance and renewal and rehabilitation. These activities are detailed in:

Procedure QMS-SOP15-1 Infrastructure Maintenance and Replacement

16. Sampling, Testing and Monitoring

Sampling, testing and monitoring activities are conducted throughout the PCDS and are conducted in accordance with O.Reg 170/03 and as per:

Procedure QMS-SOP16-1 Sampling, Testing and Monitoring

17. Measurement and Recording Equipment Calibration and Maintenance

Measuring and recording equipment used to monitor the quality of water includes but is not limited to:

- Colorimeter
- pH meter
- turbidity meter

This equipment is calibrated and maintained on a regular basis, as detailed in:

Procedure QMS-SOP17-1 Control of Monitoring and Measuring Devices

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18. Emergency Management

Some emergency situations/service interruptions that could occur include, contamination, transmission line or major watermain breaks, or interruptions in pressure. The Risk Assessment Outcomes in Section 8 can be referenced for emergency procedures or contingency plans. Specific responses for drinking water system emergencies and training requirements are detailed in:

Port Colborne Distribution System Emergency Preparedness Plan

In addition to the above, the City has an Emergency Plan in accordance with prevailing legislation and regulations which is updated annually. The Director of Engineering and Operations maintains a copy of the corporate Emergency Plan in their office, located at the Engineering and Operations Centre.

The responsibilities of all positions within the municipality during an emergency are listed in the Emergency Plan, as is the emergency communication protocol.

19. Internal Audits

The QMS Rep ensures that all elements of the QMS are audited within the three (3) year audit cycle, with specific processes audited once every calendar year, to evaluate conformity to the DWQMS. Internal audit criteria, frequency, scope, methodology and recordkeeping requirements are detailed in:

Procedure QMS-SOP19-1 Internal Audit

20. Management Review

Management reviews are conducted once every calendar year to evaluate the continuing suitability, adequacy and effectiveness of the QMS and considers information from a variety of sources, including internal and external audit findings. Details regarding the information to be used by management to review the QMS are provided in:

Procedure QMS-SOP20-1 Management Review

21. Continual Improvement

The City shall strive to continually improve the effectiveness of the QMS through the results of: internal audits, external audits, risk assessment reviews, infrastructure reviews, management reviews and through the consideration of best management practices at least once every thirty-

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six (36) months. Additionally, staff suggestions and comments from the public may also be used to continually improve the QMS.

The use of corrective and/or preventive actions to generate continual improvement opportunities is detailed in:

Procedure QMS-SOP21-1 Corrective Action and Continual Improvement

C. RELATED DOCUMENTS AND RECORDS

Procedures:

- QMS-SOP05-1 Document and Record Control Procedure
- QMS-SOP07-1 Risk Assessment Procedure
- QMS-SOP11-1 Personnel Shortage Contingency Procedure
- QMS-SOP12-1 Communications Procedure
- QMS-SOP13-1 Essential Supplies and Services Procedure
- QMS-SOP14-1 Review and Provision of Infrastructure Procedure
- QMS-SOP15-1 Infrastructure Maintenance and Replacement Procedure
- QMS-SOP16-1 Sampling, Testing and Monitoring Procedure
- QMS-SOP17-1 Control of Monitoring and Measuring Devices Procedure
- QMS-SOP18-1 Provision of Drinking Water in a Distribution System Emergency
- QMS-SOP19-1 Internal Audit Procedure
- QMS-SOP20-1 Management Review Procedure
- QMS-SOP21-1 Corrective Action and Continual Improvement Procedure

Operational Procedures:

- SOP C1 Adverse Drinking Water Quality Incident Notification – Port Colborne Distribution System and Sherkston Community Centre
- SOP C2 Repair of Watermain Breaks
- SOP C5 Corrective Action for Adverse Water Quality – Distribution System

QMS Policy

- Port Colborne Distribution System Emergency Preparedness Plan
- Port Colborne Distribution System Operations and Maintenance Manual
- Port Colborne Emergency Plan

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APPENDIX 1
QUALITY POLICY
QMS-PP

APPENDIX 2
COUNCIL ENDORSEMENT

APPENDIX 3

**TABLE 8.1: Distribution System Risk Assessment Outcomes – March 24, 2015
QMS-OPA3**

APPENDIX 4

**Figure 9.1: Drinking Water Responsibilities Organizational Chart – June 2015
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