Quality Management System (QMS)

# Operational Plan

Elgin-Middlesex Pumping Station
(London Portion)

# Corporation of the City of London

(Owner)

# Ontario Clean Water Agency

(Operating Authority)

Revision 3, 2013-10-31

## DISCLAIMER STATEMENT

This Operational Plan is designed for the exclusive use of the Corporation of the City of London.

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

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

# OPERATIONAL PLAN

## Elgin-Middlesex Pumping Station (London Portion)

Owned by the Corporation of the City of London
Operated by the Ontario Clean Water Agency

This Operational Plan defines and documents the Quality Management System (QMS) for the Elgin-Middlesex Pumping Station (London Portion) operated by the Ontario Clean Water Agency (OCWA). It sets out 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) legislated under the Safe Drinking Water Act.

The Table of Contents on page 5 lists the page reference for each of the 21 Elements described within the Drinking Water Quality Management Standard (DWQMS). As appendices to the Operational Plan, procedures have been provided to address the needs of specific Elements.

## OPERATIONAL PLAN REVISION HISTORY

| Date | Revision | Description of Revision |
|---|---|---|
| 2012-10-20 | 0 | New Operational Plan issued by new Operating Authority |
| 2013-04-30 | 1 | Revisions to implement the OCWA template and include owner comments |
| 2013-08-31 | 2 | Minor clerical revisions |
| 2013-10-31 | 3 | External & Internal Audits |

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## LIST OF APPENDICES

# 1 Quality Management System (QMS)

OCWA, as the contracted Operating Authority for the Elgin-Middlesex Pumping Station(EMPS) which includes the City of London Water Supply System, has prepared this Operational Plan to document the Quality Management System in place at this facility that meets the requirements of the Drinking Water Quality Management Standard with the purpose of:

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

The owner of the City of London Water System within the Elgin Pumping Station is the Corporation of the City of London.

# 2 Quality Management System (QMS) Policy

*The Ontario Clean Water Agency, as the contracted Operating Authority for the Elgin-Middlesex Pumping Station (London Portion), is committed to*

- *the maintenance and continual improvement of the Quality Management System (QMS)*
- *supplying safe drinking water to its consumers,*
- *complying with applicable legislation and regulations.*

*This policy shall serve as a foundation for our QMS.*

This QMS Policy has been reviewed with all OCWA personnel who operate this facility. The Owner has reviewed this Policy and the Policy is in a format that can be readily communicated to the public through websites and postings. The Policy is currently posted at the facility and documented within this Operational Plan.

# 3 Commitment & Endorsement of the QMS & Operational Plan

This Operational Plan supports the overall goal of OCWA and the Corporation of the City of London to provide safe, cost-effective drinking water. OCWA will be responsible for developing, implementing, maintaining and continually improving the QMS with respect to the operation and maintenance of the EMPS(London Portion) and will do so in a manner that not only ensures compliance with applicable legislation and regulations but also informs and obtains approval from the owner about any proposed changes to the QMS.
Re-endorsement will occur when there is a change in Operating Authority or a major process change that would change the scope of the original Operation Plan.

Through the following endorsement, the Corporation of the City of London and OCWA approves and commits to the QMS as documented in this Operational Plan.

| | |
|---|---|
| _____ | _____ |
| Representative – Owner* | Terry Bender, General Manager<br>Ontario Clean Water Agency<br>(Operating Authority) |
| _____ | Nov 1/13 |
| Date | Date |

* - Endorsement achieved by resolution of the Municipal Council of the Corporation of the City of London

# 4 Quality Management System Representative

The QMS representative role for this facility is jointly administered (to ensure continuity of service) by the Compliance Manager Huron Elgin Hub and the Operations and Compliance Team Lead, Elgin, Ontario Clean Water Agency. As the QMS Representatives, they share the responsibility and authority to:

1. Administer the QMS by ensuring that processes and procedures needed for the QMS are established and maintained,
2. Ensure that current versions of documents required by the QMS are being used at all times,
3. Ensure that all personnel are aware of all applicable legislative and regulatory requirements that pertain to their duties for the operation of the Elgin-Middlesex Pumping Station,
4. Promote awareness of the QMS throughout the Operating Authority, and
5. Report to Top Management on the performance of the QMS and any need for improvement.

Top management appoints and authorizes the QMS Representatives

# 5 Document and Records Control

Refer to Appendix A for QMS Procedure EMPS (LP)-01 Document and Records Control (Element 05).

# 6 Drinking Water System

The Elgin-Middlesex Pumping Station is located at 490 South Edgeware Road, northeast of the City of St. Thomas in the Municipality of Central Elgin. It supplies water to the St. Thomas Area Secondary Water Supply System (STASWSS), the City of London distribution system, and the Aylmer Area Secondary Water Supply System (AASWSS). Specific pumps located within the Elgin-Middlesex Pumping Station and owned by the Corporation of the City of London supply water to the City of London Water Distribution System. The Operating Authority for the Elgin-Middlesex Pumping Station (London Portion) is the Ontario Clean Water Agency (OCWA).

### Owners and Operating Authorities

| Distribution System | Owner | Operating Authority |
|---|---|---|
| City of London Water System | City of London | City of London |

### General Information

The portion of the Elgin-Middlesex Pumping Station owned by the Corporation of the City of London and designated as the Elgin-Middlesex Pumping Station (London Portion) consists of the following:

- Piping specific to the London pumps starts at the suction inlet
- three centrifugal pumps
- one hydropneumatic surge tank with two air compressors
- piping, electrical, mechanical, instrumentation, and SCADA/PLC controls

The Elgin-Middlesex Pumping Station is operated and monitored by the OCWA operators stationed at the Elgin Area Primary Water Supply System (EAPWSS) Water Treatment Plant.

## Description of Water Source

The water feeding into the EMPS(London Portion) originates from Lake Erie and is treated and pumped to the Elgin-Middlesex Pumping Station from the EAPWSS Water Treatment Plant, which provides safe potable water that meets all regulatory requirements.

***General Characteristics Raw Water entering the Elgin Area Primary Water Supply System***

| Characteristic | | 2007 | 2009 | 2011 | 2012 |
|---|---|---|---|---|---|
| Temperature ($^{o}$C) | Min. | 0 | 0 | 0 | 0 |
| | Max. | 25 | 23 | 23.7 | 24 |
| | Avg. | 9.1 | 9.1 | 8.47 | 10 |
| Colour (TCU) | Min. | 0 | 0 | 0 | 0 |
| | Max. | 248 | 750 | 475 | >900 |
| | Avg. | 21 | 28 | 36 | 30 |
| Conductivity (uohms/m) | Min. | 260 | 248 | 239 | 244 |
| | Max. | 290 | 396 | 289 | 299 |
| | Avg. | 285 | 285 | 277 | 276 |
| pH | Min. | 7.1 | 7.16 | 7.21 | 7.36 |
| | Max. | 8.84 | 8.72 | 8.80 | 8.80 |
| | Avg. | 8.21 | 8.24 | 8.18 | 8.12 |
| Turbidity (NTU) | Min. | 0.1 | 0.3 | 0.11 | 0.12 |
| | Max. | 5005 | 1195 | 1380 | 739 |
| | Avg. | 32.8 | 43.9 | 43.0 | 42.4 |

Lake Erie raw water is consistently positive for microbiological content. However, the water can be treated effectively using conventional processes to produce water meeting Ontario Drinking-Water Quality Standards.

Great Lakes water is considered to pose lower risk for the formation of disinfection by-products (DBP's). The EAPWSS water treatment plant analyzes the treated water directed to the EMPS, in accordance with applicable legislation and includes Dissolved Organic Carbon, an indicator for DBPs and distribution water for Trihalomethane (THM), the most common DBP.

## Common Event-Driven Fluctuations

SCADA Communications from the EMPS to the EAPWSS WTP are prone to dropping out during extreme weather events. During such communication failures, the system automatically switches to run off system pressures rather than tower levels. During extended communication failures, Operations staff follows the SCADA Communications Failure SOP (EMPS-SOP-04).

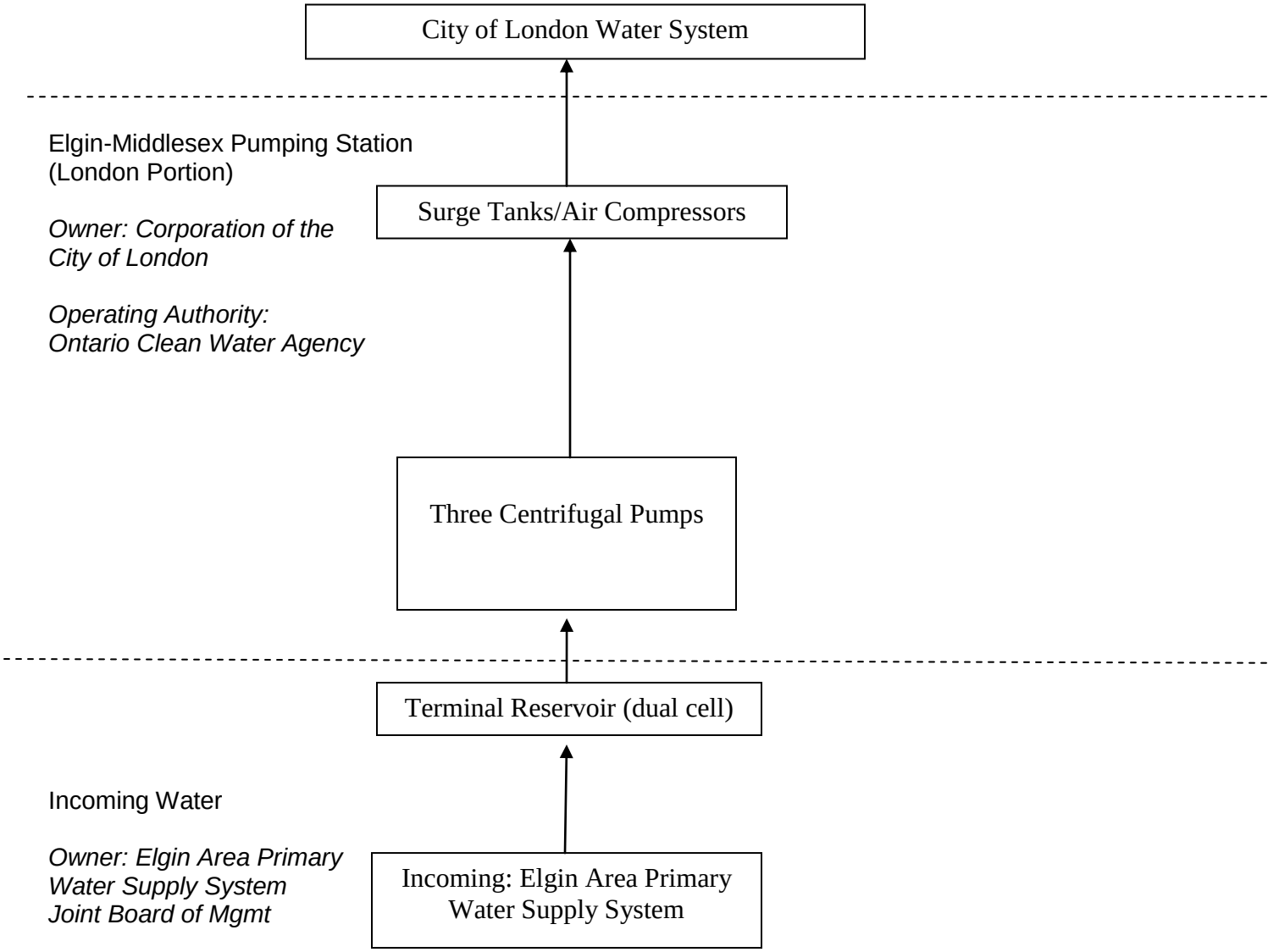
## Critical Upstream and Downstream Processes

There are no critical upstream or downstream processes relied upon by this drinking water system to provide safe potable water.

**Process Flow Chart**

Distribution

*Owner:* Corporation of the City of London
*Operator:* Corporation of the City of London




Refer to Appendix M for a completed copy of the Subject System Description Form (MOE's Director's Directions *Minimum Requirements for Operational Plans* Schedule "C").

# 7 Risk Assessment

Refer to Appendix B for QMS Procedure EMPS (LP)-02 Risk Assessment and Risk Assessment Outcomes (Element 7).

# 8 Risk Assessment Outcomes

Refer to Appendix B for QMS Procedure EMPS (LP)-02 Risk Assessment and Risk Assessment Outcomes (Element 8).

# 9 Organizational Structure, Roles, Responsibilities and Authorities

Organizational Structure and Top Management

OCWA provides operation, maintenance and management services for hundreds of water and wastewater facilities throughout the Province of Ontario. Direct operational activities are primarily delivered through the Agency's Operations Division.

To best meet the needs of each facility and its owner, OCWA's Operations Division is structured as follows:

- *Hub* – Facilities are grouped together geographically to form hubs. The General and/or Senior Operations Manager have oversight responsibility for all of the facilities contained within a particular hub.
- *Regional* – Hubs are further grouped together to form regions, each headed by a Regional Manager. Regional Managers play a critical role within OCWA's Quality Management System in that they act as a key link between corporate and facility level management.
- *Provincial* – Regions are under the direction of a VP of Operations.

The Organizational Structure chart (Appendix C) reflects the lines of responsibility and authority for the Quality Management System at both the facility and corporate level.

Quality Management System Roles, Responsibilities and Authorities

OCWA management defines the roles, responsibilities and authorities under its Quality Management System for all employees whose work could have a significant impact on drinking water quality. These are communicated to all personnel to ensure that individual roles and responsibilities and how they relate to those of the rest of the organization are understood.

Specific Quality Management System related roles, responsibilities and authorities of Operations personnel for the facility are summarized in the table below. Additional duties of employees are described in their job specifications.

| Position | Quality Management System Roles, Responsibilities and Authorities |
|---|---|
| Owner (Corporation of the City of London) | • Prescribe requirements and monitor the operation of the EMPS as per the Contractual Agreement between the Owner and the Operating Authority<br>• Represent the EMPS (LP) on behalf of the consumer<br>• Oversee status and progress of the QMS<br>• Oversee capital projects<br>• Communicates with Top Management of the Operating Authority<br>• Facilitate communications with the Operating Authority<br>• Review QMS items, contractual reports, and government reports prepared by the Operating Authority |
| All Operations Personnel | • Work in accordance with OCWA policies, procedures and plans<br>• Document all activities<br>• Participate in Quality Management System training<br>• Be aware of all the environmental and public health risks at the facility<br>• Consider risks and ramifications of all actions<br>• Participate in testing and development of SOPs and contingency plans<br>• Implement action plans to rectify deficiencies identified in audits and inspections of the facility<br>• Take all appropriate training to ensure competence in their job<br>• Identify and bring forward to the Operations Manager opportunities for improving the facility's Quality Management System<br>• Perform duties in compliance with applicable legislation and regulations |
| General Manager<br>(Hub Level Top Management) | • Ensure appropriate facility resources to maintain and continually improve the Quality Management System<br>• Review major issues/deficiencies (including those from audit and inspection reports) and provide further direction to address/resolve<br>• Ensure that all facilities have a site-specific emergency plan<br>• Participate in/respond to regular facility Management Reviews, as appropriate<br>• Report to corporate level Top Management on the status of the Quality Management System implemented at the facility<br>• Liaise with the owner/owner representative on relevant components of the Quality Management System including OCWA's roles, responsibilities and authorities for the facility, as appropriate |
| Senior Operations Manager<br>(Facility Level Top Management) | • Under the direction of the General Manager delegate responsibilities, deploy resources and supervise sound operation and maintenance of the facility and of the QMS<br>• Under the direction of the General Manager ensures internal audits (compliance and QMS) are conducted<br>• Develop action plans to respond to the findings of the internal audits and MOE inspections and verify action plan completion |

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| | • Establish, test and update a site-specific emergency plan for each facility<br>• Report to the General Manager on the performance and effectiveness of the Quality Management System implemented at the facility<br>• Liaise with the owner on relevant components of the Quality Management System including OCWA's roles, responsibilities and authorities for the facility<br>• Establish a training plan for staff to address regulatory requirements and the Quality Management System as part of the PPR process<br>• Participate in regular facility Management Reviews<br>• Oversee the computerized Work Management System (CMMS) |
| Compliance Manager<br>(Facility Level Top Management and QMS Representative) | • Deploy resources and supervise maintenance of the Quality Management System<br>• Participate in the completion of annual internal audits<br>• Assist in the development and implementation of action plans to respond to audit and MOE inspection findings<br>• Assist in the establishment, testing and updating of a site-specific emergency plans<br>• Report to the Senior Operations Manager on Quality Management System implementation and identify the need for additional processes and procedures<br>• Liaise with the owner on relevant components of the Quality Management System<br>• Assist to develop/implement training plans for staff to address regulatory requirements and the Quality Management System<br>• Act for the Senior Operations Manager in his/her absence<br>• Lead regular facility Management Reviews<br>• Fulfill defined duties of the Quality Management System Representative |
| Operations & Compliance Team Lead)<br>(QMS Representative) | • Fulfill duties assigned by the Senior Operations Manager<br>• Participate in the completion of annual internal audits and develop/monitor/implement action plans to respond to the findings<br>• Participate in MOE inspections and assist in the response to required actions or recommendations<br>• Actively participate in the development and maintenance of facility emergency plans<br>• Supervise and direct operational staff and activities in order to meet all relevant legislation, regulations and legal instruments<br>• Assist management in providing recommendation for annual capital forecasts and gathering information for operational reports as required<br>• Assist in the preparation of facility manuals and documenting operating processes and procedures for staff<br>• Participate in regular facility Management Reviews<br>• Report to the Senior Operations Manager on Quality Management System implementation and identify the need for additional processes and procedures<br>• Liaise with the owner on relevant components of the Quality |

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| | Management System<br>• Deliver/participate in training on regulatory requirements and the Quality Management System<br>• Implement, monitor and support corporate Quality Management System programs<br>• Support Senior Operations Manager on all aspects of the Quality Management System and fulfill assigned duties of the QMS Representative<br>• Act for management during vacations or periodic absences<br>• May act as Operator-in-Charge (OIC) and/or Overall Responsible Operator (ORO) when required.<br>• Perform duties of Operator/Mechanic as required |
| Distribution &Maintenance Team Lead | • Fulfill duties assigned by the Senior Operations Manager<br>• Participate as a technical advisor to staff and management and provide specialized training on technical or other issues.<br>• Prepare and/or coordinate staff work assignments and follow up to ensure completion<br>• Assist management in providing recommendation for annual capital forecasts and gathering information for operational reports as required<br>• Assist in the preparation of facility manuals and documenting operating processes and procedures for staff<br>• Actively participate in the development and maintenance of facility emergency plans and assist with emergencies as required.<br>• Act for management during vacations or periodic absences.<br>• Perform duties of Operator/Mechanic as required<br>• May act as Operator-in-Charge (OIC) and/or Overall Responsible Operator (ORO) when required.<br>• Supervise and direct maintenance staff and activities in order to meet all relevant legislation, regulations and legal instruments<br>• Assist management in developing annual O&M budgets and provide recommendations relating to potential O&M expenditures |
| Operator/Mechanic | • Fulfill duties assigned by the Senior Operations Manager/Operations and Compliance Team Lead<br>• Monitor facility processes through visual inspection, the SCADA system or by taking readings from the process control equipment<br>• Operate and adjust equipment/processes to maintain compliance with applicable regulations, permits, certificates and established operating procedures<br>• Collect samples and perform laboratory tests and equipment calibrations as required<br>• Regularly inspect operating equipment, perform routine preventive maintenance and repairs and prepare and complete work orders as assigned.<br>• Participate in facility inspections and audits<br>• Train and direct new staff on the facility processes, equipment and procedures.<br>• Maintain the facility log book according to regulatory requirements<br>• May act as Operator-in-Charge (OIC) and/or Overall Responsible Operator (ORO) when required. |

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| Utility Plant Instrument Technician/Operator | • Provide advice and technical expertise on the services required for process control and automation systems<br>• Formulate technical plans and proposals for deployment and delivery of process control and automation systems in support of operational activities<br>• Coordinate, maintain and provide technical services in regards to process control and automation systems including preventive maintenance procedures<br>• Discuss and advise on detailed system and programming requirements, modify existing and new software in response to plant requests, train plant operations and maintenance staff, analyze and resolve problems/error conditions, document changes/modifications and configure, install and support related software, hardware and network for such systems<br>• Conduct inspections of the process control and automation systems to validate that all is operating within established parameters<br>• Install and commission new electrical/electronic equipment and automation systems<br>• Perform duties of UPIT/Operator as required |
| Maintenance Mechanic/Operator | • Fulfill duties assigned by the Senior Operations Manager/Distribution and Maintenance Team Lead<br>• Schedule and perform maintenance on equipment and processes in accordance with established procedures and record the maintenance data in CMMS<br>• Regularly inspect operating equipment, perform routine preventive maintenance and repairs<br>• Prepare work orders according to established procedures and create detailed reports<br>• Perform duties of Mechanic/Operator as required. |
| Maintenance Electrician/Operator | • Perform repairs and/or scheduled maintenance on electrical systems, equipment, components and devices in accordance with established procedures and record the maintenance data<br>• Regularly inspect operating equipment, perform routine preventive maintenance and repairs<br>• Monitor facility processes through visual inspection, the SCADA system or by taking readings from the process control equipment<br>• Operate and adjust equipment/processes to maintain compliance with applicable regulations, permits, certificates and established operating procedures<br>• Perform duties of Electrician/Operator as required |

# 10 Competencies

The following table presents the competencies required by OCWA personnel whose duties directly affect drinking water quality.

| Position | Required Competencies |
|---|---|
| General Manager | • Operator certification in good standing; minimum Class III Distribution required to act as ORO<br>• Comprehensive general knowledge of and experience in managing water treatment operations, maintenance as well as facility financial planning and administration<br>• Outstanding team leadership, managerial and co-coordinating skills<br>• Sound knowledge of relevant legislation, regulations, codes, policies, guidelines and procedures<br>• Knowledge and awareness of the DWQMS<br>• Strong initiative, analytical, evaluating and problem-solving skills to assess administrative and technical needs and capabilities<br>• Well-developed priority-setting and time management skills<br>• Superior interpersonal skills<br>• Excellent oral and written communication skills<br>• Proficiency in office and operational computerized systems<br>• Valid Class G Driver's License |
| Senior Operations Manager | • Experience in water treatment operations, maintenance as well as facility financial planning and administration<br>• Advanced knowledge of relevant legislation, regulations, codes, policies, guidelines and procedures<br>• Knowledge and awareness of the DWQMS<br>• Advanced technical knowledge of principles, practices, technologies and methodologies for water treatment<br>• Familiarity with complex mechanical equipment and electronic controls<br>• Analytical, evaluating and problem-solving skills<br>• Project management, work planning and scheduling skills<br>• Good oral and written communication skills<br>• Proficiency in office and operational computerized systems<br>• Management/supervisory experience<br>• Valid Class G Driver's License |
| Compliance Manager | • Operator certification in good standing; minimum OIT<br>• Good knowledge of water treatment processes to operate the facility<br>• Experience and knowledge of the maintenance and repair of a variety of equipment and structures<br>• Excellent working knowledge of legislation, regulations, codes, policies, guidelines and procedures related to operations and maintenance<br>• Excellent Knowledge and awareness of the DWQMS<br>• Basic mathematics and chemistry<br>• Familiarity with computers, monitoring and operating systems<br>• Knowledge to use and understand operating and maintenance manuals, blueprints and other technical specifications<br>• Planning, scheduling and problem-solving skills to regularly inspect and monitor the facility, processes and equipment<br>• Good oral and written communication skills |

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|---|---|
| | • Ability to work in a team and take initiative when required.<br>• Valid Class G Driver's License |
| Team Leads (Operations & Compliance; Maintenance & Distribution) | • Operator certification in good standing; minimum Class 1 Distribution<br>• Extensive knowledge and experience of water treatment processes to operate the facility<br>• Experience and knowledge of the maintenance and repair of a variety of equipment and structures<br>• Good working knowledge of legislation, regulations, codes, policies, guidelines and procedures related to operations and maintenance<br>• Knowledge and awareness of the DWQMS<br>• Basic mathematics and chemistry<br>• Good knowledge of computers, monitoring and operating systems<br>• Good knowledge to use and understand operating and maintenance manuals, blueprints and other technical specifications<br>• Planning and organizational skills to lead projects and provide technical direction to staff<br>• Demonstrated leadership and decision making skills required to direct an operational team<br>• Problem solving and evaluative skills to provide technical guidance and resolve operational issues<br>• Planning skills to regularly inspect and monitor the facility, processes and equipment and perform routine preventative maintenance<br>• Good oral and written communication skills<br>• Ability to work in a team and take initiative when required.<br>• Valid Class G Driver's License |
| Operator/Mechanic | • Operator certification in good standing; minimum OIT<br>• Experience and knowledge of the maintenance and repair of a variety of equipment and structures<br>• Good knowledge of water treatment processes to operate the facility<br>• Good working knowledge of legislation, regulations, codes, policies, guidelines and procedures related to operations and maintenance<br>• Knowledge and awareness of the DWQMS<br>• Basic mathematics and chemistry<br>• Familiarity with computers, monitoring and operating systems<br>• Knowledge to use and understand operating and maintenance manuals, blueprints and other technical specifications<br>• Planning, scheduling and problem-solving skills to perform a variety of maintenance and repair tasks<br>• Good oral and written communication skills<br>• Ability to work with a team and take initiative when required.<br>• Valid Class G Driver's License |
| Utility Plant Instrumentation Technician/Operator | • Operator certification in good standing; minimum OIT<br>• Theoretical and practical knowledge/experience/training in water/wastewater treatment operation processes, design, instrumentation, process control and automation systems<br>• Knowledge and awareness of the DWQMS<br>• Technical evaluation and design skills necessary for process control and automation optimization and deployment<br>• Experience in delivering technical guidance for hardware/software selection<br>• Thorough understanding of network and telecommunications |

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|---|---|
| | environment, standards and operating systems, computer language, ladder logic and relational and document based database management systems<br>• Ability to monitor, review and troubleshoot network, hardware, software and instrumentation performance<br>• Analytical and evaluative problem-solving skills to assess client, process and control requirements<br>• Well-developed organizational, time and project management skills<br>• Superior interpersonal skills<br>• Good oral and written communication skills<br>• Valid Class G Driver's License |
| Maintenance Mechanic/Operator | • Operator certification in good standing; minimum OIT<br>• Good knowledge of water treatment processes<br>• Experience and knowledge of the maintenance and repair of a variety of equipment and structures<br>• Good working knowledge of legislation, regulations, codes, policies, guidelines and procedures related to operations and maintenance<br>• Knowledge and awareness of the DWQMS<br>• Good working knowledge of tools and test equipment<br>• Familiarity with computers, monitoring and operating systems<br>• Knowledge to use and understand operating and maintenance manuals, blueprints and other technical specifications<br>• Planning, scheduling and problem-solving skills to regularly inspect and monitor the facility, processes and equipment<br>• Good oral and written communication skills<br>• Ability to work in a team and take initiative when required.<br>• Valid Class G Driver's License |
| Maintenance Electrician/Operator | • Completion of any electrical or electronic training program certified by the Ministry of Colleges and Universities<br>• Operator certification in good standing; minimum OIT<br>• Experience in performing maintenance and repair of electrical and electronic equipment<br>• Good working knowledge of legislation, regulations, codes, policies, guidelines and procedures related to operations and maintenance<br>• Good working knowledge of tools and test equipment<br>• Familiarity with computers, monitoring and operating systems<br>• Knowledge to use and understand operating and maintenance manuals, blueprints and other technical specifications<br>• Familiarity with computers, monitoring and operating systems<br>• Good oral and written communication skills<br>• Ability to work from plans and schematic diagrams<br>• Knowledge and awareness of the DWQMS<br>• Ability to work in a team and take initiative when required<br>• Valid Class G Driver's License |

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

Certified operators are responsible for completing the annual number of required training hours for the highest type and class of subsystem where the operator works and completing mandatory courses required by *Safe Drinking Water Act* (SDWA) O. Reg. 128/04 Certification of Drinking Water System Operators and Water Quality Analysts. The Senior Operations Manager takes reasonable steps to ensure that every operator has the opportunity to attend training to meet the annual training hour requirements.

OCWA's Operational Training Program is maintained by the Risk, Compliance & Training Division and aims to:

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

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

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

Awareness of the DWQMS is promoted through:

- The OCWA Employee Orientation Program for new employees,
- Training sessions and meetings at the EAPWSS Water Treatment Plant
- HUB/regional level training sessions and meetings and
- The Agency's Environmental Compliance course. It is recommended that OCWA's Environmental Compliance course be attended by all new staff and at least every five years to ensure staff are kept current on any changes to regulatory requirements and to reinforce their roles and responsibilities under DWQMS.
- The mandatory MOE 1 day course for all operators

Other mandatory and recommended training requirements are listed as part of the Employee Orientation Program available on OCWA's intranet or through the Human Resources department.

Individual OCWA employee training records are maintained and tracked using a computerized system, the Training Summary database, which is also administrated by the Risk, Compliance & Training Division. Training records maintained at the facility are controlled as per Procedure EMPS (LP)-01 Document and Records Control.

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

# 11 Personnel Coverage

Refer to Appendix D for QMS Procedure EMPS (LP)-03 Personnel Coverage (Element 11).

# 12 Communications

Refer to Appendix E for QMS Procedure EMPS (LP)-04 Communications (Element 12).

# 13 Essential Supplies and Services

Refer to Appendix F for QMS Procedure EMPS (LP)-05 Essential Supplies and Services (Element 13).

# 14 Review and Provision of Infrastructure

Refer to Appendix G for QMS Procedure EMPS (LP)-06 Review and Provision of Infrastructure (Element 14).

# 15 Infrastructure Maintenance, Rehabilitation and Renewal

Planned Maintenance

OCWA, under contract with the owner, maintains a program of scheduled inspection and maintenance of infrastructure for which it is operationally responsible. Routine planned maintenance activities include: pump inspection, analyzer calibrations, flow meter calibrations and valve inspection

Planned maintenance activities are scheduled using a computerized Work Management System (CMMS) that allows user to:

- Enter detailed asset information
- Generate and process work orders
- Access maintenance and inspection procedures
- Plan, schedule and document all asset related tasks and activities
- Access maintenance records and asset histories

Planned maintenance activities are communicated to the person responsible for completing the task through the issuance of CMMS work orders. Work orders are generated by the Senior Operations Manager or designate on a Monthly basis and are distributed accordingly. Completed work orders are submitted to the Maintenance/Distribution Team Lead for review and entry into CMMS. Records of these activities are maintained as per QMS Procedure EMPS (LP)-01 Document and Records Control.

The Senior Operations Manager or designate maintains the inventory of equipment in CMMS and ensures that appropriate maintenance plans are in place. Maintenance plans are developed according to the manufacturer's instructions, regulatory requirements, industry standards, and/or client service requirements. Equipment Operation and Maintenance (O&M) manuals are accessible to staff at the locations specified in QMS Procedure EMPS (LP)-01 Document and Records Control.

Unplanned Maintenance

Unplanned maintenance is conducted as required. All unplanned maintenance activities are authorized by the Senior Operations Manager or designate. Unplanned maintenance activities are recorded on work orders and are entered into CMMS.

Rehabilitation and Renewal

Rehabilitation and renewal activities including capital upgrades are determined on an annual basis in consultation with the Owner (refer to EMPS (LP)-06 Review and Provision of Infrastructure). A list of required replacement or desired new equipment is compiled and prioritized by the Senior Operations Manager and is presented to the Owner for review and comment. All major expenditures require the approval of the Owner.

Program Monitoring and Reporting

To assist in monitoring the effectiveness of the program, the General Manager and Senior Operations Manager are provided with monthly summary reports for the facility. In addition, OCWA's Executive Management Team is provided with hub and regional summary reports on an ongoing basis.

# 16 Sampling, Testing and Monitoring

Refer to Appendix H for QMS Procedure EMPS (LP)-07 Sampling, Testing and Monitoring (Element 16).

# 17 Measurement and Recording Equipment Calibration and Maintenance

Refer to Appendix I for QMS Procedure EMPS (LP)-08 Measurement and Recording Equipment Calibration and Maintenance (Element 17).

# 18 Emergency Management

Refer to Appendix J for QMS Procedure EMPS (LP)-09 Emergency Management (Element 18).

# 19 Internal QEMS Audits

Refer to Appendix K for QMS Procedure EMPS (LP)-10 Internal QMS Audits (Element 19).

# 20 Management Review

Refer to Appendix L for QMS Procedure EMPS (LP)-11 Management Review (Element 20).

# 21 Continual Improvement

In conjunction with the internal QMS audit and Management Review processes documented above, OCWA uses action plans to continually improve its QMS. Through these processes, areas of concern as well as opportunities for improvement are identified at the drinking water systems operated and maintained by OCWA.

# LIST OF APPENDICES

# Appendix A

EMPS (LP)-01 Document and Records Control (Element 5)

## DOCUMENT and RECORDS CONTROL

### 1.0 Purpose

The purpose of this document is to describe how the operating authority's QMS documents are kept current and how QMS documents and records are kept legible, readily identifiable, retrievable, stored, protected, retained and disposed of.

### 2.0 Scope

This procedure applies to QMS Documents and QMS Records pertaining to the Elgin-Middlesex Pumping Station (London Portion), as identified in this procedure.

### 3.0 Responsibility

General Manager
Senior Operations Manager
Compliance Manager
All Facility Staff

### 4.0 Definitions

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

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

*QMS Document* – any document required by the Operating Authority's QMS as identified in this procedure

*QMS Record* – any record required by Operating Authority's QMS as identified in this procedure

*Controlled* – managed as per the conditions of this procedure

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

### 5.0 Procedure

5.1 Documents and records required by the Operating Authority's QMS are listed in Table 1.

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

5.3 Additional controls for QMS Procedures within this Operational Plan are used to ensure appropriate review and approval. These include the use of authorized approval, alpha-numeric procedure code, issue date, revision number and revision history.

Authorized positions for review and approval of QMS Procedures for the Elgin-Middlesex Pumping Station (London Component) are:

| | |
|---|---|
| Review | Compliance Manager |
| Approval | Senior Operations Manager |

5.4 The Compliance Manager and the Operations and Compliance Team Lead are responsible for ensuring that current versions of QMS documents are being used at all times. Current QMS documents and records are readily accessible to Operations personnel and to internal and external auditors/inspectors at document control locations established by the Senior Operations Manager. The currency of internal documents is ensured by comparing the date on the document to that of the master hardcopy and/or electronic copy residing in the designated document control location(s) specified in Table 1.

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

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

Access to facility QMS records contained within internal electronic databases and applications (PDC, CMMS, WaterTrax) is administered by designated application managers/trustees, requires the permission of the Senior Operations Manager and is restricted through use of usernames and passwords.

SCADA records are maintained and accessible to all staff when required by username and password.

5.6 Any employee of the drinking water system may request a revision to improve an existing internal QMS document or the preparation of a new document. The need for new or updated documents may also be identified through the Management Review or system audits.

The QMS Representatives communicate any changes made to QMS documents to relevant facility personnel and coordinates related training (as required).

5.7 When a QMS document is superseded, affected facility personnel are informed that the hardcopy of the document is to be promptly removed from its location and forwarded to the QMS Representative or designate for disposal or retention (as appropriate).

5.8 The authorized method for disposal of hardcopy documents and records is shredding.

5.9 QMS documents and records are retained in accordance with applicable regulations and legal instruments. Relevant regulatory and operating authority's minimum retention periods are listed in Table 2.

5.10 The Operational Plan is reviewed for currency at least annually by the Compliance Manager and the Operations and Compliance Team Lead in preparation for audits and the Management Review. Other QMS-related documents are reviewed as per the schedules set out in this Operational Plan or as significant changes (e.g., changes in regulatory requirements, operational processes and/or equipment, etc.) occur. QMS documents and records are reviewed for evidence of control during each internal system audit as per QMS Procedure EMPS (LC)-10 Internal QMS Audits.

## 6.0 Related Documents

EMPS (LC)-10 Internal QMS Audits

## 7.0 Revision History

| Date | Revision # | Reason for Revision |
|---|---|---|
| 2012-12-20 | 0 | Procedure issued |
| 2013-04-30 | 1 | Revisions to include owner comments |
| 2013-10-31 | 2 | Update Table – Internal |

**Table 1:** Designated location for documents and records required by OCWA's QMS

| Type of Document/Record | Designated Document Control Location (HC = Hardcopy, E = Electronic) |
|---|---|
| **Internal QMS Documents** | |
| Operational Plan (includes QMS Procedures) | E = Local Server (EAPWSS)<br>HC = At Facility and at EAPWSS Facility |
| QMS Policy | E = OCWA's intranet, Local Server (EAPWSS), and public website<br>HC = Posted at Facility |
| Facility Emergency Plans | E = Local Server (EAPWSS)<br>HC = At Facility and at EAPWSS Facility |
| Emergency Response Plan (corporate) | E = OCWA's intranet and Local Server (EAPWSS)<br>HC = At Facility and at EAPWSS Facility |
| Standard Operating Procedures and forms (referenced in Operational Plan and QMS Procedures) | E = Local Server (EAPWSS)<br>HC = At Facility and at EAPWSS Facility |
| Operations Manual | E = Local Server (EAPWSS)<br>HC = At Facility and at EAPWSS Facility |
| Essential Supplies & Services List | E = Local Server (EAPWSS)<br>HC = At Facility and at EAPWSS Facility |
| Shift/Vacation Schedule | HC = At EAPWSS Facility |
| Sampling Procedures – EA-Admin-2050 | E = Local Server (EAPWSS)<br>HC = At EAPWSS Facility |
| | |
| **External QMS Documents** | |
| Maintenance/equipment manuals | HC = At Facility and at EAPWSS Facility |
| Engineering schematics/plans/drawings | HC = At Facility and at EAPWSS Facility |
| Municipal Drinking Water License and Drinking Water Works Permit | E = Local Server (EAPWSS)<br>HC = At Facility and at EAPWSS Facility |
| Applicable federal and provincial legislation and municipal by-laws | Online at www.e-laws.gov.on.ca |
| | |
| **QMS Records** | |
| Facility Operations Logbook(s) | HC = At Facility and EAPWSS |
| Operator training records | E = Local Server (EAPWSS) and OCWA's Training Summary Database<br>HC = At Facility and at EAPWSS Facility |
| Maintenance records (CMMS) | E = Local Server (EAPWSS)<br>HC = At EAPWSS Facility |
| Calibration records | HC = At EAPWSS Facility |
| Laboratory analyses | E = Local Server (EAPWSS)<br>HC = At EAPWSS Facility |
| In-house lab results | E = Local Server (EAPWSS)<br>HC = At EAPWSS Facility |
| SCADA records | E = Local Server (EAPWSS) |

| Type of Document/Record | Designated Document Control Location (HC = Hardcopy, E = Electronic) |
|---|---|
| Sampling Forms – EF-Admin - 2050, 2052 & 2054 | E = Local Server (EAPWSS)<br>HC = At EAPWSS Facility |
| Internal QMS audit reports | E = Local Server (EAPWSS)<br>HC = At EAPWSS Facility |
| External audit reports | E = Local Server (EAPWSS)<br>HC = At EAPWSS Facility |
| Management Review documentation | E = Local Server (EAPWSS)<br>HC = At EAPWSS Facility |
| Internal QMS Communications | E = Local Server (EAPWSS)<br>HC = At EAPWSS Facility |
| External QMS Communications | E = Local Server (EAPWSS)<br>HC = At EAPWSS Facility |
| AWQI Reports | E = Local Server (EAPWSS)<br>HC = At EAPWSS Facility |
| Infrastructure review (capital/maintenance works recommendations) | E = Local Server (EAPWSS)<br>HC = At EAPWSS Facility |
| Community complaint records | E = Local Server (EAPWSS)<br>HC = At EAPWSS Facility |

**Table 2:** Relevant regulatory and corporate minimum retention periods

| Type of Document/Record | Minimum Retention Time | Requirement Reference |
|---|---|---|
| DWQMS Operational Plan | 10 years | Director's Direction under SDWA |
| Internal QMS Audit Results | 10 years | OCWA Requirement |
| External QMS Audit Results | 10 years | OCWA Requirement |
| Management Review Documentation | 10 years | OCWA Requirement |
| Documents/records required to demonstrate conformance with the DWQMS | 3 years | OCWA Requirement |
| Documents/records required to demonstrate compliance with Ontario legislation | As per applicable regulations | SDWA O. Reg. 170/03, O. Reg. 128/04 |

# Appendix B

EMPS (LP)-02 Risk Assessment (Element 7) and Risk Assessment Outcomes (Element 8)

## 1.0 Purpose

The purpose of this document is to define the process for conducting a drinking water risk assessment and for documenting and reviewing the results of the assessment at this facility.

## 2.0 Scope

This procedure applies to Elgin Middlesex Pumping Station (London Portion) water facility and includes the identification and assessment of potential hazardous events and hazards that could affect drinking water safety. OCWA's approach to addressing other potential hazards is set out in QMS Procedure EMPS (LP)-09 Emergency Management.

## 3.0 Responsibility

General Manager
Senior Operations Manager
Compliance Manager
Operations & Compliance Team Lead

## 4.0 Definitions

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

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

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

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

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

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

*Likelihood* – the probability of a hazard or hazardous event occurring

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

## 5.0 Procedure

5.1 The General Manager assigns personnel to conduct the risk assessment (e.g., Senior Operations Manager, Compliance Manager, Operations & Compliance Team Lead, Maintenance staff, Operators, and other facility personnel).

5.2 Using the system's process diagram, identify hazardous events and associated hazards (possible outcomes) that could impact the system's ability to deliver safe drinking water in Table 1 for each activity/process step. Tables referred to in this procedure are contained within the facility-specific Summary of Risk Assessment Outcomes Table 2-Identified Critical Control Points.

5.3 For each of the hazardous events, specify control measures currently in place at the facility that eliminate the hazard or prevent it from becoming a threat to public health.

Note: Some hazards/hazardous events may have step-by-step contingency plans associated with them. These contingency plans are developed as per the Emergency Management Program and are further described in QMS Procedure QP-09 Emergency Management.

5.4 To ensure that potential drinking water health hazards are addressed and minimum treatment requirements as regulated by SDWA O. Reg. 170/03 and the *Procedure for Disinfection of Drinking Water in Ontario* are met, mandatory Critical Control Points (CCPs) have been established.

As a minimum, the following must be included as CCPs (as applicable):

- Processes necessary to achieve the required log removal or inactivation of pathogens including chemical and/or UV disinfection system and filtration process for surface water. Filtration process includes related processes (e.g., chemical coagulation, rapid mixing, flocculation, sedimentation).
- Processes necessary for maintaining a disinfectant residual in the distribution system (includes re-chlorination points)
- Fluoridation system

Identify the above processes (as they apply) as mandatory CCPs in the 'CCP' column in Table 1.

5.5 To determine if there are any additional CCPs for the system, evaluate and rank the hazardous events (as set out below in steps 5.6 and 5.7) for the remaining activities/process steps (i.e., those not included as mandatory minimum CCPs).

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

| Value | Likelihood of Hazardous Event Occurring |
|---|---|
| **1** | **Rare** – Estimated to occur every 50 years or more (usually no documented occurrence at site) |
| **2** | **Unlikely** – Estimated to occur in the range of 10 – 49 years |
| **3** | **Possible** – Estimated to occur in the range of 1 – 9 years |
| **4** | **Likely** – Occurs monthly to annually |
| **5** | **Certain** – Occurs monthly or more frequently |
| **Value** | **Consequence of Hazardous Event Occurring** |
| **1** | **Insignificant** – Little or no disruption to normal operations, no impact on public health |
| **2** | **Minor** – Significant modification to normal operations but manageable, no impact on public health |
| **3** | **Moderate** – Potentially reportable, corrective action required, potential public health impact, disruption to operations is manageable |
| **4** | **Major** – Reportable, system significantly compromised and abnormal operations if at all, high level of monitoring and corrective action required, threat to public health |
| **5** | **Catastrophic** – Complete failure of system, water unsuitable for consumption |

Multiply the likelihood and consequence values to determine the risk value (ranking) of each hazardous event and record all values in Table 1. Hazardous events with a ranking of 12 or greater are considered high risk.

5.7 Review the hazardous events and rankings documented in Table 1 and identify any activity/process step as an additional CCP, if not already a mandatory CCP, and if all of the following criteria are met:

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

5.8 List identified CCPs (required mandatory and any additional CCPs established by the risk assessment) in Table 2. Set related critical control limits (e.g., limits for turbidity, chlorine residual, temperature, pH) for each CCP as appropriate.

5.9 Ensure procedures have been developed and implemented at the facility to:

- Monitor the critical control limits
- Respond to, report and record deviations from the critical control limits.

List these procedures in Table 2.

5.10 The information recorded in the Summary of Risk Assessment Outcomes is maintained at the facility level on an ongoing basis. At least once a year, the Compliance Manager and Operations and Compliance Team Lead reviews the risk assessment documentation to verify the currency of the information and the validity of the assumptions used in the risk assessment in preparation for the Management Review.

5.11 The General Manager ensures that a risk assessment is conducted and documented at least once every thirty-six months.

## 6.0 Related Documents

Summary of Risk Assessment Outcomes (facility-specific)
EMPS (LP)-09 Emergency Management

## 7.0 Revision History

| Date | Revision # | Reason for Revision |
|---|---|---|
| 2012-12-20 | 0 | Procedure issued |
| 2013-04-30 | 1 | Revised to include owner comments |

# Summary of Risk Assessment Outcomes

Elgin-Middlesex Pumping Station (London Portion)

**Table 1:** Risk Assessment Table

| Activity/ Process Step | Description of Hazardous Event | Possible Outcome (Hazards) | Existing Control Measures | Likelihood | Consequence | Risk Value | CCP? |
|---|---|---|---|---|---|---|---|
| Supply of Water | Loss of water supply | Lower distribution system pressure increases potential for intrusion of chemical and microbiological contaminants | Back-up pump(3)<br>SCADA Monitoring<br>Alarms<br>Operator Checks<br>Operator Training<br>Preventative Maintenance<br>EMPS-SOP-002 – Pipeline Break<br>Back feed from London or bypass reservoir | 1 | 3 | 3 | ☐ Yes – Mandatory CCP<br>☐ Yes – Additional CCP identified for facility<br>☒ No |
| General Operations | Flooding in operations building | Short Circuiting of power to equipment which can lead to one or both of the first two Hazardous events listed above | SCADA Monitoring<br>Alarms<br>Operator Checks<br>Operator Training<br>Preventative Maintenance<br>Back feed from London or bypass reservoir | 1 | 3 | 3 | ☐ Yes – Mandatory CCP<br>☐ Yes – Additional CCP identified for facility<br>☒ No |
| General Operations | Fire in Electrical Panels | Short Circuiting of power to equipment which can lead to one or both of the first two Hazardous events listed above | SCADA Monitoring<br>Alarms<br>Operator Checks<br>Operator Training<br>Preventative Maintenance<br>EMPS-SOP-006 – Fire at the EMPS<br>Back feed from London or bypass reservoir | 1 | 3 | 3 | ☐ Yes – Mandatory CCP<br>☐ Yes – Additional CCP identified for facility<br>☒ No |
| General Operations | Unauthorized Access | Accidental or deliberate sabotage of equipment which can lead to the first two Hazardous events listed above | Security Monitoring and Fencing<br>Alarms<br>Operator Checks<br>Secured Access Points (Locks) | 1 | 3 | 3 | ☐ Yes – Mandatory CCP<br>☐ Yes – Additional CCP identified for facility |

| Activity/ Process Step | Description of Hazardous Event | Possible Outcome (Hazards) | Existing Control Measures | Likelihood | Consequence | Risk Value | CCP? |
|---|---|---|---|---|---|---|---|
| | | | SCADA Monitoring<br>EMPS-SOP-001 – Unauthorized Entry or vandalism<br>Back feed from London or bypass reservoir | | | | ☒ No |
| General Operations | Adverse Water | Threat to the health of consumers<br>Boil Water Advisory | SCADA Monitoring<br>Operator Review of continuous Chlorine readings every 72 hours<br>Alarms<br>Operator Checks<br>Operator Training<br>Preventative Maintenance<br>EMPS-SOP-D3 – Report of Adverse Drinking Water Quality Incidents (ADWQI) | 1 | 4 | 4 | ☐ Yes – Mandatory CCP<br>☐ Yes – Additional CCP identified for facility<br>☒ No |
| General Operations | Loss of power supply | Loss of power to equipment which can lead to the first two Hazardous events listed on the first page of this table. The second event is the more likely of the two. | Back-up Diesel Generator<br>SCADA Monitoring<br>Alarms<br>Operator Checks<br>Operator Training<br>Preventative Maintenance<br>Monitoring of Diesel Fuel Inventory<br>Back feed from London or bypass reservoir<br>EMPS-SOP-23 – Power Failure at the EMPS | 1 | 3 | 3 | ☐ Yes – Mandatory CCP<br>☐ Yes – Additional CCP identified for facility<br>☒ No |
| General Operation | Communications Failure between facility and the EAPWSS main plant | Loss of controlling signals to equipment which can lead to either or both of the first two Hazardous events listed on the first page of this table. | EMPS-SOP-04 – SCADA Communication Failure<br>SCADA Monitoring-Alarms<br>Operator Checks<br>Operator Training<br>Preventative Maintenance<br>On-call person dispatched to site for control & monitoring | 3 | 3 | 9 | ☐ Yes – Mandatory CCP<br>☐ Yes – Additional CCP identified for facility<br>☒ No |

| Activity/ Process Step | Description of Hazardous Event | Possible Outcome (Hazards) | Existing Control Measures | Likelihood | Consequence | Risk Value | CCP? |
|---|---|---|---|---|---|---|---|
| General Operations | Pandemic, strike (loss of staff) | No one to attend to Alarms, etc. Could potentially lead to either or both of the first two Hazardous events listed on the first page of this table. | Facility Emergency Plan<br>Back-up staff from other OCWA locations<br>Strike Management Negotiations establishing essential staff positions<br>Management positions fulfilling Operator Duties | 1 | 3 | 3 | ☐ Yes – Mandatory CCP<br>☐ Yes – Additional CCP identified for facility<br>☒ No |
| General Operations | Severe Storm | Loss of access to EMPS (LC). Could potentially lead to either or both of the first two Hazardous events listed on the first page of this table. | SCADA Monitoring<br>Alarms<br>Can operate remotely from EAPWSS plant<br>Operator Training | 1 | 3 | 3 | ☐ Yes – Mandatory CCP<br>☐ Yes – Additional CCP identified for facility<br>☒ No |
| General Operations | Operator Error | Error could potentially lead to either or both of the first two Hazardous events listed on the first page of this table. | SCADA Monitoring<br>Alarms<br>Operator Training | 1 | 3 | 3 | ☐ Yes – Mandatory CCP<br>☐ Yes – Additional CCP identified for facility<br>☒ No |
| General Operations | Diesel Fuel Spill | Contamination of Reservoir | Diesel Fuel Inventory Monitoring<br>Operator Checks<br>Operator Training<br>Operator Supervision of Delivery of Diesel Fuel<br>Complaint Response Measures<br>Proper containment<br>Not possible due to elevations | 1 | 3 | 3 | ☐ Yes – Mandatory CCP<br>☐ Yes – Additional CCP identified for facility<br>☒ No |
| General Operations | Use of chemicals or water contacting materials that do not meet ANSI NSF 60 or 61 respectively | Potential for low level contamination of drinking water | Corporate Purchasing Control<br>QMS Procedure EMPS (LC)-05 Essential Supplies and Services<br>Operator Training | 1 | 2 | 2 | ☐ Yes – Mandatory CCP<br>☐ Yes – Additional CCP identified for facility<br>☒ No |

| Activity/ Process Step | Description of Hazardous Event | Possible Outcome (Hazards) | Existing Control Measures | Likelihood | Consequence | Risk Value | CCP? |
|---|---|---|---|---|---|---|---|
| General Operations | Chlorine Residual Analyzer Failure | Loss of chlorine residual information and potential for non compliance with regulatory requirements | SCADA Monitoring<br>Alarms<br>Operator Training<br>Operator Checks including manual grab sample chlorine residuals<br>Preventative Maintenance<br>Chlorine Residual from EAPWSS plant | 1 | 2 | 2 | ☐ Yes – Mandatory CCP<br>☐ Yes – Additional CCP identified for facility<br>☒ No |

**Table 2:** Identified Critical Control Points (CCPs)

| CCP | Critical Control Limits | Monitoring Procedures | Response, Reporting and Recording Procedures |
|---|---|---|---|
| No CCPs identified | NONE – Secondary disinfection is maintained by regulatory and contractual requirements | | |

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

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

| Date of Activity | Type of Activity | Participants | Summary of Results |
|---|---|---|---|
| Oct 31/12<br><br>Oct 31/15 | Risk Assessment Conducted<br><br>36 Month Assessment due - scheduled in CMMS | R. Turnbull / C. Grimstead | Reconsidered all identified Hazards and incorporated results into OCWA corporate format style table. Removed detectability column and based risk ranking on the multiplication of the likelihood and consequence factors. No critical control point identified. |

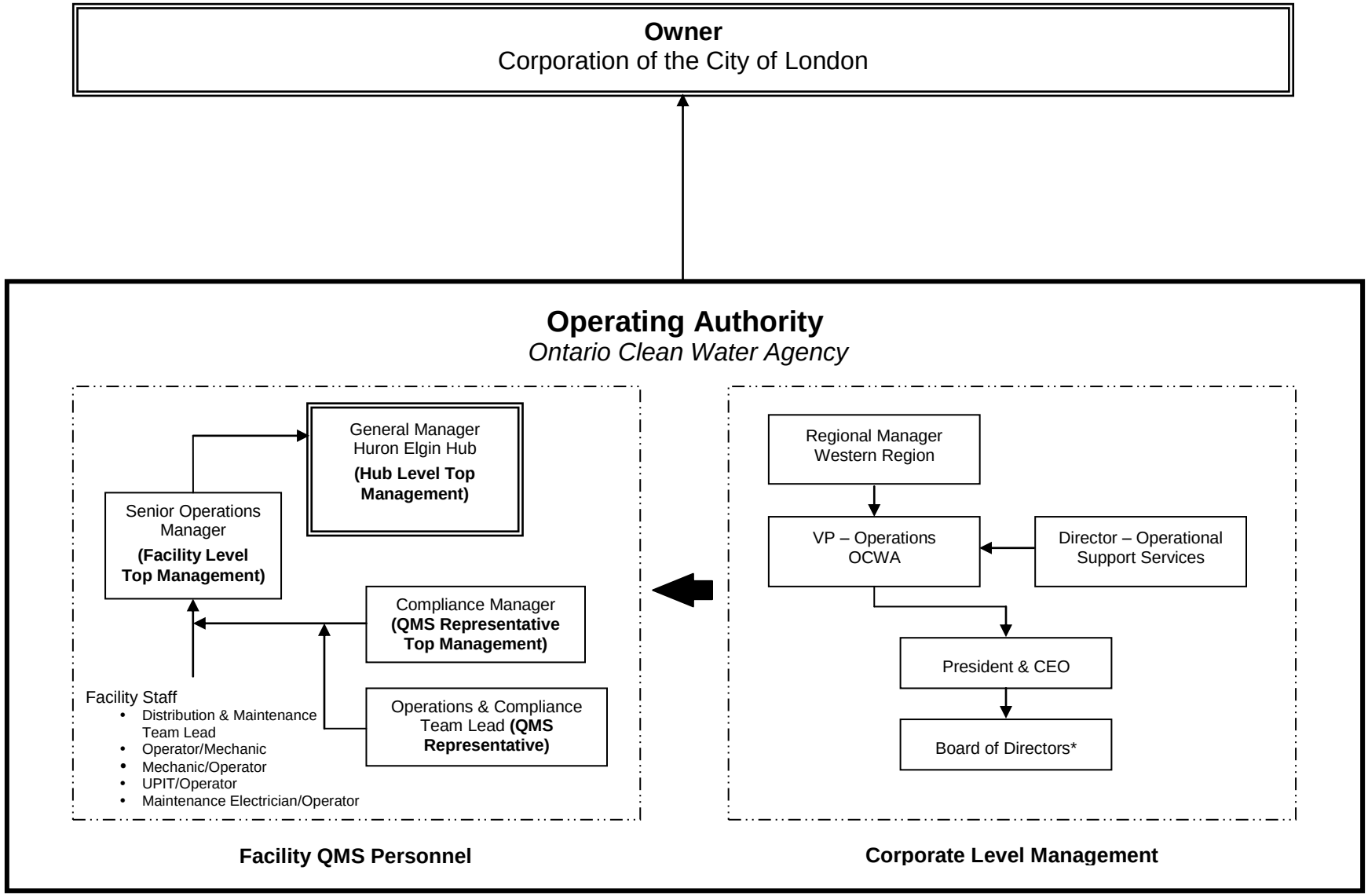
## Revision History

| Date | Revision # | Reason for Revision |
|---|---|---|
| 2012 -10-31 | 0 | Adaption to Policies of New Operating Authority |
| 2013 -07-31 | 1 | Updated reference to shared SOP's |
| 2013-10-31 | 2 | Updated Table – Internal Audit |

# Appendix C

## QMS Organizational Structure for the Elgin-Middlesex Pumping Station (London Portion) – Element 9

# QMS Organizational Structure for the Elgin-Middlesex Pumping Station (London Portion)




Endorsement & Approval of the Facility's QMS & Operational Plan

Overall Leadership & Support for OCWA's QMS

Delineates Corporate & Facility Level Functions

* Represents the highest level of OCWA's Top Management

# Appendix D

EMPS (LP)-03 Personnel Coverage (Element 11)

## PERSONNEL COVERAGE

### 1.0 Purpose

To describe the procedure for ensuring that sufficient and competent personnel are available for duties that directly affect drinking water quality.

### 2.0 Scope

This procedure applies to operations personnel at the Elgin-Middlesex Pumping Station (London Portion).

### 3.0 Responsibility

General Manager
Senior Operations Manager

### 4.0 Definitions

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

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

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

(*Crown Employees Collective Bargaining Act*, 1993)

### 5.0 Procedure

5.1 The Senior Operations Manager ensures that personnel meeting the competencies identified in the Operational Plan are available for duties that directly affect drinking water quality.

5.2 The Elgin-Middlesex Pumping Station (London Portion) is monitored by OCWA personnel as follows:

Staffed 24/7 from the nearby Elgin Area Primary Water Supply System based on 12 hour shifts beginning at 5:00 AM and at 17:00 PM.

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

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

5.4 The Senior Operations Manager assigns an on-call staff member for the time that the facility is un-staffed (i.e., evenings, weekends and Statutory Holidays). The on-call shift change is 07:30 Tuesday. The on-call schedule is maintained by the Senior Operations Manager and consists of a 3-week rotation, is set on a quarterly basis and posted in the control.

5.5 The on-call operator conducts a physical inspection of the facility Tuesdays and Thursdays. Details of the inspection are recorded in the facility logbook.

5.6 The Senior Operations Manager is responsible for approving vacation time for staff in a manner which ensures sufficient personnel are available for the performance of normal operating duties.

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

5.8 A contingency plan for Critical Shortage of Staff is included in the Facility Emergency Plan. This plan provides direction to staff in the event that there is a severe shortage of staff due to sickness (e.g., pandemic flu) or other unusual situations where personnel might not be available.

## 6.0 Related Documents

Facility Logbook
Shift/Vacation Schedule

## 7.0 Revision History

| Date | Revision # | Reason for Revision |
|---|---|---|
| 2012-12-20 | 0 | Procedure issued |
| 2013-10-31 | 1 | OFI – Internal Audit |

# Appendix E

EMPS (LP)-04 Communications (Element 12)

## COMMUNICATIONS

### 1.0 Purpose

The purpose of this procedure is to describe the processes for QMS-related communications between the facility's Top Management and water facility personnel; the owner; suppliers; the public; and the operating authorities for other water facilities who are receiving water from this water facility.

### 2.0 Scope

The Procedure applies to facility level internal and external communications regarding the Quality Management System (QMS) implemented at the Elgin-Middlesex Pumping Station (London Portion).

### 3.0 Responsibility

Senior Operations Manager (Facility Level Top Management)
Compliance Manager
Operations & Compliance Team Lead
Operators

### 4.0 Definitions

None

### 5.0 Procedure

5.1 The General Manager, Senior Operations Manager, Compliance Manager, and Operations and Compliance Team Lead are responsible for identifying and coordinating any site-specific communications in relation to the status/development of the facility's QMS.

5.2 After being hired, OCWA staff are requested to attend, when available, the OCWA designed Environmental Compliance course which provides not only updates on applicable legislation but also general awareness training on DWQMS.

The Senior Operations Manager ensures new facility personnel receive site-specific training on the QMS Operational Plan and Procedures plus other related operating instructions and procedures as part of the orientation process.

Revisions to the QMS Operational Plan and associated documentation are communicated to relevant employees and the owner/owner representative at meetings, through internal memos or e-mails on an as-needed basis. The Operational Plan and procedures are available to all facility employees as per Table 1 of the Document and Records Control Procedure (Element 5) EMPS (LP)-01.

5.3 The continuing suitability, adequacy and effectiveness of the water facility's QMS are communicated to the owner/owner representative as part of the Management Review process.

5.4 Communication requirements for ensuring suppliers and contractors understand the relevant QMS policies, procedures and expectations are described in QMS Procedure Essential Supplies and Services (Element 13) EMPS (LP)-05.

5.5 Media enquiries must be directed to the owner/owner representative by the operating authority. The owner/owner representative coordinates with water operation personnel (as appropriate) in responding to media enquiries.

5.6 The QMS Policy is communicated to the public through the owner/owner representative's and is available upon request. The QMS Policy is also posted at the facility.

All complaints are documented in the water facility logbook. As appropriate, the Senior Operations Manager ensures that the Owner is informed of the complaint and that an action plan is developed to address the issue in a timely manner. The Compliance Manager ensures that consumer feedback is included for discussion at the Management Review.

5.7 Internal and external communication responsibilities and reporting requirements for emergency situations are set out under OCWA's Emergency Management Program (i.e., Facility Emergency Plan and OCWA's Emergency Response Plan).

5.8 Communications to the Operating Authorities and Owners of other water facilities receiving water from this facility will be handled initially by the Operating Authority where adverse water, mechanical, and/or electrical problems interrupt the supply of water to the other water facilities. If this communication becomes necessary, the owner's representative for Elgin-Middlesex Pumping Station (London Portion) will also be notified about the communications.

5.9 Communication with the owner/owner representative in terms of reporting on Operations, Maintenance and Compliance is based on Schedule F of the Agreement as per the following table:

## SCHEDULE F - Reporting

| EMPS Reporting Plan | | |
|---|---|---|
| **Report** | **Frequency** | **Submission** |
| Operations, Maintenance and Compliance | Monthly | Informally discuss facility operations |
| Operations, Maintenance and Compliance | Monthly | Formal report 15 days after month end |
| Annual Report (MOE)<br>(O. Reg. 170, Section 11) | Annually | February 1 |
| Yearly Summary Report<br>(O. Reg. 170, Schedule 22) | Annual | February 28 |
| Capital Recommendations | Quarterly/annually | Quarterly and by October 31 for preceding year |
| Contingency and Emergency Preparedness | | Within 90 days of the start of the contract |
| Review of provision of infrastructure | Annually | Oct 31 |
| Management Review | Annually | 30 days after review |
| Internal Audit Report | Annually | 30 days after audit |
| Initial Condition Survey | | 90 days from the start of the contract |
| Final Condition Survey | | 60 days prior to end of term |

| Proposed Meeting Schedule | | |
|---|---|---|
| **Meeting** | **Frequency** | **Agenda** |
| Operations and Maintenance | Quarterly | 45 days following quarter end |
| Annual performance review | Annual (yearend) | Review of operations, maintenance, compliance and capital for the year. |
| Capital Recommendations | Annual (Q3) | Presentation of recommended capital for coming year |

## 6.0 Related Documents

Facility Logbook
EMPS (LP)-01 Document and Records Control
EMPS (LP)-05 Essential Supplies and Services
EMPS (LP)-09 Emergency Management
EMPS (LP)-11 Management Review
Facility Emergency Plan
Contractual Agreement

## 7.0 Revision History

| Date | Revision # | Reason for Revision |
|---|---|---|
| 2012-12-20 | 0 | Procedure issued |
| 2013-08-31 | 1 | Minor revisions-clerical |

# Appendix F

EMPS (LP)-05 Essential Supplies and Services (Element 13)

## ESSENTIAL SUPPLIES and SERVICES

### 1.0 Purpose

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

### 2.0 Scope

This procedure applies to essential supplies and services pertaining to the Elgin-Middlesex Pumping Station (London Portion), as identified in this procedure.

### 3.0 Responsibility

General Manager
Senior Operations Manager

### 4.0 Definitions

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

### 5.0 Procedure

5.1 A separate Essential Supplies and Services list is reviewed and updated as required by the QMS Representative. Table 1 Attached.

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

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

5.3 As part of the procurement process, potential suppliers/service providers are informed of relevant aspects of OCWA's QMS through the tendering process and through specific terms and conditions set out in our agreements and purchase orders.

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

Contracted personnel including suppliers may be requested or required to participate in additional relevant training/orientation activities to ensure conformance with facility procedures and to become familiar with the facility off loading and accessibility requirements.

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

5.5 All third-party drinking water testing services are provided by accredited and licensed laboratories.

5.6 Calibration services are provided by qualified personnel.

5.7 Chemicals purchased for use in the drinking water treatment process must meet AWWA Standards and be ANSI/NSF 60 certified.

The facility orders and receives ongoing deliveries of chemicals to satisfy current short-term needs based on processing volumes and storage capacities.

5.8 Process components/equipment provided by the supplier must meet applicable regulatory requirements (e.g. ANSI NSF 61) and industry standards for use in drinking water systems prior to their installation.

## 6.0 Related Documents

Essential Supplies and Services List

## 7.0 Revision History

| Date | Revision # | Reason for Revision |
|---|---|---|
| 2012-11-05 | 0 | Procedure issued |
| 2013-08-31 | 1 | Minor revisions-clerical |

**Table 1:**

# QMS Essential Supplies & Services List

| Supply/Service | Risk | Current Supplier | Purchasing Procedure (to ensure the procurement of each item) |
|---|---|---|---|
| Sodium Hypochlorite | Critical Control Point (associated with chlorine/ disinfection) | Anchem Sales<br>120 Stronach Crescent<br>London, ON<br>N5V 3A1<br><br>Toll free: 1-800-387-9799<br>Local: (519)451-1614<br>Fax: (519) 451-4593 | 12% sodium hypochlorite is normally ordered by the Operator. A binder in the EAPWSS control room is used to keep track of date ordered, amount ordered, operator initials, date received. Sodium hypochlorite is used in post-maintenance disinfection. Product must conform to ANSI/NSF 60 standards. |
| Gas Chlorine | Critical Control Point (associated with chlorine/ disinfection) | Brenntag Canada 43 Jutland Rd.<br>Etobicoke, ON<br>M8Z 2G6<br><br>(800) 268-0358 | Chlorine levels are monitored by SCADA. Chlorine is normally ordered by the Operator. A binder in the EAPWSS control room is used to keep track of date ordered, amount ordered, operator initials, and date received. Product must conform to ANSI/NSF 60 standards. |
| Diesel Fuel (Emergency back-up power) | | Dowler-Karn<br>43841 Talbot Line<br>St. Thomas, ON<br>N5P 3S7<br><br>Phone: 519-631-3810<br>Fax: 519-631-4755 | |
| General Pump and other Equipment Repair and parts supplier | | Dielco Industrial Contractors<br>61 Enterprise Drive<br>London, Ontario<br>N6N 1A4<br><br>Phone: 519-685-2224<br>Fax: 519-685-6818 | Contractors and their personnel shall have all necessary licenses, permits and/or certificates of approval as required for performing the task. Only subcontractors which demonstrate competence to the satisfaction of the Owner and/or OA and have a completed sign off form (EF-ADMIN-1700) on file are allowed to perform work on site. Any parts supplied that will come in direct contact with the drinking water shall conform to ANSI/NSF 61 standards. Conformance certificates for each piece of equipment shall be submitted to the Compliance Manager for filing prior to installation. |

| Supply/Service | Risk | Current Supplier | Purchasing Procedure (to ensure the procurement of each item) |
|---|---|---|---|
| SCADA control system repair/troubleshooting | Monitoring Risk | Hardie Environmental<br>594 Newbold St.<br>London, Ontario<br>N6E 2W9<br><br>Phone: 519-649-1433<br><br>Summa Engineering<br>6423 Northam Drive<br>Mississauga, Ontario<br>Canada L4V 1J2<br><br>Phone: 905-678-3388<br>Fax: 905-678-0444 | Minimum requirements to ensure quality are: technology diploma and adequate knowledge of water treatment processes and practices. Only subcontractors which demonstrate competence to the satisfaction of the Owner and/or OA and have a completed sign off form (EF-ADMIN-1700) on file are allowed to perform work on-site. |
| Lab Supplies | Monitoring Risk | ClearTech.<br>7480 Bath Road<br>Mississauga, ON<br>L4T 1L2<br><br>Order Desk:<br>1-800-387-7503<br>Fax 1-888-281-8109<br>www.cleartech.ca<br><br>VWR International<br>2360 Argentia Rd.<br>Mississauga, Ontario<br>Canada, L5N 5Z7<br><br>Phone: 1-905-813-7377<br>Fax: 1-800-668-6348<br><br>John Meunier<br>2000 Argentia Rd,<br>Plaza, Suite 430<br>Mississauga, ON<br>L5N 1W1<br><br>Contact: Jason Boomhour<br>Cell: 519-274-3416<br>jboomhour@johnmeunier.com | Lab chemicals are normally ordered by the Operator or Compliance Manager. Lab chemicals are kept on hand so that there is always at least one spare package in the cupboard. Chemical ordering also depends on expiry date. |
| Lab Services (Chemical parameters) | Monitoring Risk | Maxxam<br>6740 Campobello Road<br>Mississauga, ON<br>L5N 2L8<br><br>Tel. (905)-817-5700<br>Fax (905) 817-5777<br>www.maxxam.ca | Lab services are monitored by the Compliance Manager. Samples are sent quarterly to this lab service. |

| Supply/Service | Risk | Current Supplier | Purchasing Procedure (to ensure the procurement of each item) |
|---|---|---|---|
| Lab Services (Microbiological parameters) | Monitoring Risk | SGS labs<br>657 Consortium Court<br>London, ON<br>N6E 2S8<br>(519) 672-4500 | Lab services are monitored by the Compliance Manager. Samples sent to this lab service are done only when there is a need such as adverse drinking water quality incident on the pipeline or installation of new equipment. |
| Calibration Services and monitoring equipment supplies | Monitoring Risk | **BIDS Technical Services Inc.**<br>21 Kevlin Road<br>Markham, ON<br>L3R 8P1<br><br>Phone: 416-432-1565<br>Fax: 905-474-3229<br><br>**ICS**<br>525 Highland Road West<br>Suite 406<br>Kitchener, ON<br>N2M 5P4<br><br>Phone: 519-465-2489<br>Phone 2: 519-465-2497<br>Fax: 519-669-9256<br><br>**Metcon (flowmeters)**<br>15 Connie Cres., Unit 3<br>Concord, Ontario,<br>L4K 1L3<br><br>Phone: 905-738-2355<br>Fax: 905-738-5520 | Calibration service providers are normally chosen by the Senior Operations Manager.<br><br>Quarterly instrumentation calibrations are completed by the contracted calibration service. To ensure quality and consistency the calibration service provider shall adhere to the Calibration Procedure (EMPS-ADMIN-2200). Minimum requirements to ensure quality are: technology diploma and adequate knowledge of water treatment processes and practices. Only subcontractors which demonstrate competence to the satisfaction of the Owner and/or OA and have a completed sign off form (EF-ADMIN-1700) on file are allowed to perform work on-site. |
| Source Water | Monitoring Risk | Elgin Area Primary Water Supply System | Water quality is monitored by SCADA |

## Revision History

| Date | Revision | Description of Revision |
|---|---|---|
| 2012-12-20 | 0 | Issued by new Operating Authority |
| 2013-10-31 | 1 | Updated table |

# Appendix G

EMPS (LP)-06 Review and Provision of Infrastructure (Element 14)

# REVIEW and PROVISION of INFRASTRUCTURE

## 1.0 Purpose

The purpose of this document is to describe the procedure for reviewing the adequacy of infrastructure necessary to operate and maintain a drinking water system.

## 2.0 Scope

Applies to the Elgin-Middlesex Pumping Station (London Portion)

## 3.0 Responsibility

Operating Authority: General Manager/Senior Operations Manager
Owner: Corporation of the City of London

## 4.0 Definitions

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

## 5.0 Procedure

5.1 As per Section 4.6 of the Service Agreement, by no later than October 31 on an annual basis, the Senior Operations Manager conducts a review of the drinking water system's infrastructure to assess its adequacy for the operation and maintenance of the system. Information is gathered from initial condition assessments, preventative and breakdown maintenance records.

5.2 The output of the review is an estimate of Capital Expenditures that is submitted to the owner/owner's representative by October 31 annually for review and comment. Together with the owner/owner's representative, timelines and responsibilities for implementation of priority items are determined and documented.

5.3 The Senior Operations Manager ensures that results of the review are included as input to the Management Review process.

## 6.0 Related Documents

Minutes of Management Review
Estimate of Capital Expenditures
Service Agreement

## 7.0 Revision History

| Date | Revision # | Reason for Revision |
|---|---|---|
| 2012-12-20 | 0 | Procedure issued |
| 2013-08-31 | 1 | Minor revisions-clerical |
| 2013-10-31 | 2 | OFI External Audit |

# Appendix H

EMPS (LP)-07 Sampling, Testing and Monitoring (Element 16)

## SAMPLING, TESTING and MONITORING

### 1.0 Purpose

The purpose of this document is to describe the procedure for sampling, testing and monitoring for process control and finished drinking water quality.

### 2.0 Scope

This procedure applies to sampling, testing and monitoring at the Elgin-Middlesex Pumping Station (London Portion) - EMPS (LP).

### 3.0 Responsibility

General Manager
Senior Operations Manager
Compliance Manager
Operations and Process Team Lead
Operators

### 4.0 Definitions

*Challenging Conditions* – any existing characteristic of the water source or event-driven fluctuations that impact the operational process as identified and listed under the Drinking Water System section in the facility's Operational Plan

### 5.0 Procedure

5.1 All sampling, monitoring and testing is conducted at a minimum in accordance with SDWA O. Reg. 170/03. Adverse water quality incidents are responded to and reported as per ECP-D3 Report of Adverse Drinking Water Quality Incidents (ADWQI).

The collection and testing of water samples at the EMPS (LP) facility follow weekly and monthly sampling schedules identified as EF-ADMIN-2051 and EF-ADMIN-2052 respectively.

Analytical results from laboratory reports are entered/uploaded into WaterTrax. Hardcopy reports are maintained as per EMPS (LP)-01 Document and Records Control.

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

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

| Sample | Frequency |
|---|---|
| Free Chlorine Residual & Turbidity | Weekly |

Chlorine and turbidity analysis conducted at the EMPS are recorded on form EF-ADMIN-2054 and maintained at the EAPWSS.

5.4 The sampling program has been set up so that sampling occurs under all conditions including any that may be considered challenging. Additional sampling can take place if circumstances warrant (e.g. adverse sampling follow-up).

5.5 OCWA operates the EMPS (LP) and the Water Treatment Plant (EAPWSS) that supplies the water to this facility. Consequently operating staff are aware of any water quality issues that will impact the supply of water at EMPS (LP). Monitoring at the EAPWSS (upstream of EMP (LP)) is based on instructions and locations specified within Procedure # EA-ADMIN-2050 Sampling and Lab Analysis; in the weekly and monthly sampling schedules identified in step 5.1 above; and in the daily sampling schedule EF-ADMIN-2050. The monitoring complies with regulatory requirements and addresses the needs of the owner of the EAPWSS. Summaries of the data from the analysis of samples collected upstream of EMPS (LP) are provided to the owner of the EMPS (LP) as per regulatory requirements.

5.6 Sampling, testing and monitoring results are readily accessible to the owner both at the facility (hard copy) as well as through the WaterTrax database (electronic).

As a minimum, owners are provided with an annual summary of sampling, testing and monitoring results through the SDWA O. Reg. 170/03 section 11 and schedule 22 reports and through the Management Review process outlined in EMPS(LP)-11 Management Review.

## 6.0 Related Documents

Facility Logbook
EMPS (LP)-01 Document and Records Control
EMPS (LP)-11 Management Review
Laboratory Analysis Reports
Annual & Summary Report
Sampling and Lab Analysis Procedure EA-ADMIN-2050
Weekly Sampling Schedule EF-ADMIN-2051
Monthly Sampling Schedule EF-ADMIN-2052
Weekly Distribution Sampling EF-ADMIN-2054

## 7.0 Revision History

| Date | Revision # | Reason for Revision |
|---|---|---|
| 2012-12-20 | 0 | Procedure issued |
| 2013-04-30 | 1 | 5.6 revised to include how sample results are shared between the Owner and OA |
| 2013-08-31 | 2 | Minor revisions-clerical |
| 2013-10-31 | 3 | OFI – Internal Audit |

# Appendix I

## EMPS (LP)-08 Measurement and Recording Equipment Calibration and Maintenance (Element 17)

## MEASUREMENT and RECORDING EQUIPMENT CALIBRATION and MAINTENANCE

### 1.0 Purpose

The purpose of this document is to describe the procedure for the calibration/verification and maintenance of measurement and recording equipment.

### 2.0 Scope

This procedure applies to the measurement and recording equipment at the Elgin-Middlesex Pumping Station (London Portion).

### 3.0 Responsibility

Senior Operations Manager
Compliance Manager
Maintenance and Distribution Team Lead
Utility Plant Instrumentation Technician
Operators

### 4.0 Definitions

None

### 5.0 Procedure

5.1 All measurement and recording equipment calibration/verification and maintenance activities must be performed by appropriately trained and qualified personnel or by a qualified third-party calibration service provider (refer to EMPS (LP)-05 Essential Supplies and Services).

5.2 The Senior Operations Manager and the Maintenance and Distribution Team Lead establish and maintain a list of measurement and recording devices and associated calibration schedules using CMMS.

5.3 Calibration/verification and maintenance activities are carried out in accordance with procedures specified in the manufacturer's manual and/or instructions specified in CMMS. The results of calibrations/verification performed by operating authority are recorded in CMMS and can also be recorded on a calibration certificate designated EF-ADMIN-2200. Third party calibration service providers are expected to supply documentation on the devices they calibrate and that documentation must be suitable for the Senior Operations Manager and the Maintenance and Distribution Team Lead.

5.4 Any measurement device which does not meet its specified performance requirements during calibration/verification must be removed from service (if practical) until repaired or replaced. The failure must be reported to the Senior Operations Manager and the Maintenance and Distribution Team Lead. The Overall Responsible Operator (ORO) and the Operator in Charge (OIC) who are on duty at the time of the failure discovery

must be notified as soon as possible so that immediate measures can be taken to ensure that drinking water quality has not been compromised by the malfunctioning device. Any actions taken as a result of the failure are recorded in the facility logbook. The Senior Operations Manager and the Compliance Manager ensure that any notifications required by applicable legislation are completed and documented within the specified time period.

5.5 Calibration and maintenance records and maintenance/equipment manuals are maintained as per EMPS (LP)-01 Document and Records Control.

## 6.0 Related Documents

Facility Logbook
CMMS Records
Calibration/Maintenance Records
EMPS (LP)-01 Document and Records Control
EMPS (LP)-05 Essential Supplies and Services
EF-ADMIN-2200 Calibration/Verification

## 7.0 Revision History

| Date | Revision # | Reason for Revision |
|---|---|---|
| 2012-12-20 | 0 | Procedure issued |
| 2013-04-30 | 1 | Reviewed and updated |
| 2013-08-31 | 2 | Minor revisions-clerical |

# Appendix J

EMPS (LP)-09 Emergency Management (Element 18)

# EMERGENCY MANAGEMENT

## 1.0 Purpose

The purpose of this document is to describe the procedure for maintaining a state of emergency preparedness at the facility level under OCWA's Emergency Management Program.

## 2.0 Scope

This procedure applies to potential operations emergency situations or service interruptions identified for the Elgin-Middlesex Pumping Station (London Portion).

## 3.0 Responsibility

Corporate Compliance Group
General Manager
Senior Operations Manager
Compliance Manager
Operations and Compliance Team Lead
Maintenance and Distribution Team Lead
Operators

## 4.0 Definitions

*Facility Emergency Plan* – a facility level plan for preparedness for operations emergencies that can be managed by plant staff and local resources

*Emergency Response Plan* – a corporate level plan for preparedness for serious operations emergencies

## 5.0 Procedure

5.1 The Corporate Compliance Group maintains the corporate level Emergency Response Plan and the OCWA template for establishing a plan for facility level emergencies (the "Facility Emergency Plan" template). The Senior Operations Manager (or designate) ensures that a site-specific Facility Emergency Plan is established and kept up-to-date for each facility in the Hub.

5.2 OCWA has established a list of mandatory contingencies for potential emergency situations or service interruptions. These are:

- Potential or actual unsafe water
- Catastrophic equipment failure that impacts the ability to provide service
- Power failure that impacts the ability to provide service
- Accidental release that could impact the environment
- Critical injury
- Critical shortage of staff

The contingency plans are contained within the Facility Emergency Plan.

5.3 Each contingency plan must be reviewed at a minimum annually and at least one plan must be tested each year. Training on the Facility Emergency Plan is provided on an ongoing basis.

5.4 Roles and responsibilities for emergency management at OCWA operated facilities are set out in the Facility Emergency Plan under the "Roles and Responsibilities" section. Specific roles and responsibilities related to a particular emergency situation or service interruption, including those of the owner where necessary, are set out in the relevant contingency plan.

5.5 Relevant sections of the Municipal Emergency Plan, which may also contain additional information on emergency roles and responsibilities, are contained in the "Appendices" section of the Facility Emergency Plan and are incorporated into contingency plans when appropriate.

5.6 An emergency contact list is contained within the Facility Emergency Plan and is updated at least annually. Protocols for communication during emergency situations or service interruptions are set out in the individual contingency plans and in OCWA's Emergency Response Plan.

## 6.0 Related Documents

Facility Emergency Plan
Emergency Response Plan
Municipal Emergency Plan
Services Agreement
Emergency Contact List

## 7.0 Revision History

| Date | Revision # | Reason for Revision |
|---|---|---|
| 2012-12-20 | 0 | Procedure issued |
| 2013-04-30 | 1 | Reviewed and updated |
| 2013-08-31 | 2 | Minor revisions-clerical |
| 2013-10-31 | 3 | OFI – Internal Audit |

# Appendix K

EMPS (LP)-10 Internal QMS Audits (Element 19)

# INTERNAL QMS AUDITS

## 1.0 Purpose

The purpose of this document is to describe the procedure for conducting internal audits that evaluate the conformance of this facility's Quality Management System (QMS) to the requirements of the Drinking Water Quality Management Standard (DWQMS).

## 2.0 Scope

This procedure applies to all activities within the scope of the QMS implemented at the Elgin-Middlesex Pumping Station (London Portion) as documented in the Operational Plan.

## 3.0 Responsibility

General Manager
Senior Operations Manager
Compliance Manager (QMS Rep)
Operations and Compliance Team Lead (QMS Rep)
Corporate Compliance Group

## 4.0 Definitions

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

*Internal Auditor* – person with skills, training and/or experience to conduct an internal audit

*Nonconformity* – non-fulfillment of a requirement

## 5.0 Procedure

5.1 The General Manager and the Compliance Manager ensure that an internal QMS audit is conducted for the facility at least once every 12 months by personnel with adequate skills, training and/or experience.

5.2 OCWA's Corporate Compliance Group establishes the audit criteria and develops the internal audit protocol to be used by the facility's auditor(s). Protocol questions are designed to encompass all of the requirements of the DWQMS. Additional information is included in the protocol to provide clarification on the purpose and application of the requirement. The protocol is reviewed annually and updated as necessary by the Corporate Compliance Group.

5.3 The auditor(s) reviews the facility's approved policies and procedures, the results of previous internal and external QMS audits, the status of corrective and preventive actions and other QMS-related documentation prior to the audit.

5.4 The auditor(s) follows the audit protocol and engages in activities that may include asking questions, observing operations and reviewing documents and records. Non-conformities with reference to specific documents and details are recorded on the audit protocol along with any additional comments and suggestions.

5.5 Upon completion of the final audit report, the auditor(s) reviews the results and identified nonconformities with the General Manager, the Senior Operations Manager and the Compliance Manager. The audit report and supporting documentation are filed by the QMS Representatives and retained as per EMPS (LP)-01 Document and Records Control.

5.6 When non-conformity is identified through the internal audit process, an action plan to rectify the issue is developed by the Senior Operations Manager or designate, specifying responsibility and a target date for resolution. The Senior Operations Manager or designate monitors progress of the action plan related to the identified nonconformity until it is fully resolved.

The QMS Representative ensures that any necessary revisions to QMS procedures and policies are completed and communicated to relevant facility personnel.

5.7 The QMS Representative ensures that results of the audit are included as input to the management review process.

## 6.0 Related Documents

Internal Audit Protocol
Audit Reports
Action Plans
EMPS (LP)-01 Document and Records Control

## 7.0 Revision History

| Date | Revision # | Reason for Revision |
|---|---|---|
| 2012-12-20 | 0 | Procedure issued |

# Appendix L

EMPS (LP)-11 Management Review (Element 20)

# MANAGEMENT REVIEW

## 1.0 Purpose

The purpose of this document is to describe the procedure for conducting a Management Review of the Quality Management System (QMS) for this facility.

## 2.0 Scope

This procedure applies to the review of the QMS implemented at the Elgin-Middlesex Pumping Station (London Portion).

## 3.0 Responsibility

Top Management (facility level):

- General Manager
- Senior Operations Manager

Other Management Review Participants:

- Compliance Manager
- Process and Compliance Team Lead
- Regional Compliance Advisor (as required)

## 4.0 Definitions

*Management Review* – a formal (documented) meeting conducted at least once every 12 months by Top Management to evaluate the continuing suitability, adequacy and effectiveness of OCWA's Quality Management System (QMS)

## 5.0 Procedure

5.1 The General Manager and Senior Operations Manager determine a suitable frequency for Management Review meetings for the drinking water system. As a minimum, reviews must be conducted at least once every 12 months.

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

a) Incidents of regulatory non-compliance,
b) Incidents of adverse drinking water tests,
c) Deviations from critical control limits and response actions,
d) The efficacy 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 QMS,
l) Consumer feedback,
m) The resources needed to maintain the QMS,

n) The results of the infrastructure review,
o) Operational Plan currency, content and updates, and
p) Staff suggestions.

The Compliance Manager (QMS Representative) coordinates the Management Review and distributes the agenda with identified responsibilities to participants in advance of the Management Review meeting along with any related reference materials.

5.3 The Management Review participants review the data presented and make recommendations and/or initiate action plans to address identified deficiencies as appropriate.

5.4 The Compliance Manager (QMS Representative) ensures that minutes of and action plans resulting from the Management Review meeting are prepared and distributed to the General Manager and the Senior Operations Manager. Information regarding the results of the Management Review including identified deficiencies, decisions, and action items are reported to the owner/owner representative.

5.5 The General Manager or designate monitors the progress and documents the completion of action plans resulting from the Management Review.

## 6.0 Related Documents

Minutes and action plans resulting from the Management Review

## 7.0 Revision History

| Date | Revision # | Reason for Revision |
|---|---|---|
| 2012-12-20 | 0 | Procedure issued |

# Appendix M

## MOE's Director's Directions Minimum Requirements for Operational Plans – Schedule "C"

# Schedule "C"

## Subject System Description Form

## Municipal Residential Drinking-Water System

| | | |
|---|---|---|
| Owner of Municipal Residential Drinking-Water System:[1] | Corporation of the City of London | Date: 2013-10-31 |
| Name of Municipal Residential Drinking-Water System:[2] | Elgin-Middlesex Pumping Station (London Portion) | Rev.#: 1 |

## Subject Systems

| | Name of Operational Subsystems (if applicable)[3] | Name of Operating Authority[5] | DWS Number(s)[6] |
|---|---|---|---|
| ☒ Check here if the Municipal Residential Drinking-Water System is operated by one operating authority. Enter the name of the operating authority in adjacent column[4] | | Ontario Clean Water Agency | 260004917 |
| Operational Subsystem 1: | | | |
| Operational Subsystem 2: | | | |
| Operational Subsystem 3: | | | |
| Operational Subsystem 4: | | | |

**Add attachments if there are additional 'Operational Subsystems'**

## Contact Information[7]

| Name | Title | Phone No(s). | Email Address |
|---|---|---|---|
| Primary: Carl Grimstead | Compliance Manager | 519 782 3101 | cgrimstead@ocwa.com |
| Alternate: Blair Tully | Senior Operations Manager | 519 782 3101 | btully@ocwa.com |

**Subject System Description Form Notes:**

1. The legal name of the owner should be used for this entry.

2. The name of the municipal residential drinking-water system should be the name most commonly used to describe the entire system. If information or records have been submitted to the ministry respecting this system, using an identifier name (e.g. for DWS), that identifier name should be used.

3. The identification of each operational subsystem will be necessary in cases where the municipal residential drinking-water system is being operated by more than one operating authority. For example, if a municipality owns a treatment and distribution system but contracts the operation of the treatment system to a separate entity there will be two 'operational subsystems', treatment and distribution. The name used to identify these operational subsystems should be one that is commonly used or describes the component. For example, the Everytown Treatment System and the Everytown Distribution System as separate operational subsystems of the same municipal residential drinking-water system.

4. If there is only one operating authority for the municipal residential drinking-water system, the box should be checked as such. In this case the subject system is the municipal residential drinking-water system and there will be no operational subsystem. The operating authority will need to be identified in the adjacent box.

5. The legal or corporate name of the operating authority should be used for this entry.

6. The DWS number is the number, or numbers, assigned to the drinking-water system by the Ministry of the Environment in response to the owner submitting a written notice containing information about the system further to section 10.1 of O. Reg. 170/03. In some cases multiple DWS numbers may exist for components of a municipal residential drinking-water system. In these cases enter all DWS numbers. Conversely, if one DWS number exists for multiple subject systems, enter the number opposite each operational subsystem.

7. The contact entry should identify a person who may be contacted for clarification of information contained in the form. An alternate person may also be identified.



## Revision History

| Date | Revision # | Reason for Revision |
|---|---|---|
| 2012-12-20 | 0 | Procedure issued |
| 2013-10-31 | 1 | Updated Schedule with date and revision #. |