



Drinking Water Works Permit No.

084-201 issue #6

Municipal Drinking Water Licence No.

084-101 issue #4

REVISION 4

Table of Contents

INTRODUCTION	4
---------------------------	----------

1. ELEMENT 1 - QUALITY MANAGEMENT SYSTEM	5
2. ELEMENT 2 - QUALITY MANAGEMENT SYSTEM POLICY	7
3.ELEMENT3-COMMITMENT AND ENDORSEMENT	8
4.ELEMENT 4 - QMS REPRESENTATIVE	9
5.ELEMENT5 - DOCUMENT AND RECORDS CONTROL	11
6.ELEMENT 6 - DRINKING WATER SYSTEM	13
7. ELEMENT 7 - RISK ASSESSMENT	21
8 .ELEMENT 8 - RISK ASSESSMENT OUTCOMES	25
9.ELEMENT 9 - ORGANIZATIONAL STRUCTURE, ROLES, RESPONSIBILITIES AND AUTHORITIES	27
10. ELEMENT 10 - COMPETENCIES	29
11. ELEMENT 11 - PERSONNEL COVERAGE	31
12.ELEMENT 12 - COMMUNICATIONS	33
13. ELEMENT 13 - ESSENTIAL SUPPLIES AND SERVICES	35
14. ELEMENT 14 - REVIEW AND PROVISION OF INFRASTRUCTURE	37
15. ELEMENT 15 - INFRASTRUCTURE MAINTENANCE, REHABILITATION AND RENEWAL	39
16. ELEMENT 16 - SAMPLING, TESTING AND MONITORING	43
17. ELEMENT 17 - MEASUREMENT AND RECORDING EQUIPMENT CALIBRATION AND MAINTENANCE	45
18. ELEMENT 18 - EMERGENCY MANAGEMENT	47
19. ELEMENT 19 - INTERNAL AUDITS	49
20. ELEMENT 20 - MANAGEMENT REVIEW	51
21. ELEMENT 21 - CONTINUAL IMPROVEMENT	54

List of Associated Documents

E2 - QMS Policy Statement

E3 - Commitment and Endorsement
E4 - Notice of Appointment - QMS Representative
E4 - QMS Orientation Checklist
E5 - Document and Records Control Procedure
E5 - Document Approval - Change Form
E5 - Operational Plan Change History Table
E7 - CCP and Risk Assessment Summary Table
E7 - Risk Assessment - Template
E9 - Job Description and Employee Orientation Program
E9 - Organization Chart - Town of Goderich
E9 - Organization Chart - Jacobs Water Canada
E12 - Essential Supplies and Services - Letter to Provider - Blank
E12 - Essential Supplies and Services Table - Goderich
E12 - Training Record Form
E14 - Review and Provision of Infrastructure
E16 - Sampling, Testing and Monitoring Summary Table - Goderich
E18 - After Action Report / Improvement Plan - Template
E18 - SOP Review Checklist - Goderich
E19 - 5 Why Root Cause Analysis Form
E19 - Non-Conformance and Corrective Action Report
E19 - Risk Assessment - Goderich
E19 - Root Cause Analysis – Five Whys - Blank
E20 - Management Review - Town of Goderich - Template

Introduction

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

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

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

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

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

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

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

This Operational Plan is implemented and carried out by the Town of Goderich and Operating Authority and is approved by the Mayor and Council. The QMS Representative, appointed by Top Management is responsible for ensuring that all processes and procedures are established and maintained, promoting awareness and ensuring commitment to the Operational Plan. The QMS Representative reports to Top Management on QMS performance and any need for improvement. These findings are forwarded to the Mayor and Council for review and approval.

1. Element 1 - Quality Management System

1.1 PROCEDURE DESCRIPTION

The Town of Goderich, as the Owner and the Operating Authority (OMI Canada Inc -Jacobs) of the Town's Drinking Water System, is required to attain conformance to the Drinking Water Quality Management Standard (DWQMS) developed by the Ministry of the Environment, Conservation and Parks. This Operational Plan has been developed to represent the Operating Authority's Quality Management System (QMS) that conforms to the Standard.

1.2 REASON FOR PROCEDURE

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

1.3 DEFINITIONS

Not applicable

1.4 PROCEDURE

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

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

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

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

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

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

1.5 ASSOCIATED DOCUMENTS

None Applicable

1.6 REFERENCE MATERIALS

Drinking Water Quality Management Standard, Version 3.0

2. Element 2 - Quality Management System Policy

2.1 PROCEDURE DESCRIPTION

Together, the Town of Goderich and OMI Canada Inc (Jacobs) are committed to:

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

2.2 REASON FOR PROCEDURE

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

2.3 DEFINITIONS

None Applicable

2.4 PROCEDURE

The Town of Goderich and OMI Canada Inc (Jacobs) who are directly involved in the treatment, supply, and distribution of drinking water, share in the responsibilities of implementing, maintaining, and contributing to the continual improvement of the Drinking Water System through the QMS.

2.5 ASSOCIATED DOCUMENTS

E2 - QMS Policy Statement

2.6 REFERENCE MATERIALS

None Applicable

3. Element 3 - Commitment and Endorsement

3.1 PROCEDURE DESCRIPTION

Commitment and Endorsement refers to the Quality Management System as described in the Operational Plan, for the Town of Goderich.

3.2 REASON FOR PROCEDURE

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

3.3 DEFINITIONS

None Applicable

3.4 PROCEDURE

The Town of Goderich (Owner), and OMI Canada Inc (Jacobs) - the Operating Authority, support the implementation, maintenance, and continual improvement of a Drinking Water Quality Management System (QMS) for the Goderich Drinking Water System, as documented in the Operational Plan.

Endorsement by the Owner Representative and the Operating Authority Top Management acknowledges the need for, and supports the provision of sufficient resources to implement, maintain, and continually improve the Quality Management System (QMS).

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

When there are changes to the Owner (Council), the Owner-Representative or Top Management, they will be provided with a copy of the most current Operational Plan and Policy. A new Owner-Representative or Top Management will endorse the Plan and Policy within one year of employment with the municipality.

3.5 ASSOCIATED DOCUMENTS

E3 - Commitment and Endorsement

3.6 REFERENCE MATERIALS

None Applicable

4. Element 4 - QMS Representative

4.1 PROCEDURE DESCRIPTION

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

4.2 REASON FOR PROCEDURE

To identify the role of the QMS Representative for The Town of Goderich and describe the specific responsibilities and authorities placed upon the Representative.

4.3 DEFINITIONS

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

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

4.4 PROCEDURE

The QMS Representative has been appointed by Top Management. The QMS Representative regardless of other responsibilities shall:

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

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

The alternate QMS Representative is the Project Manager.

4.5 ASSOCIATED DOCUMENTS

E4 - Notice of Appointment - QMS Rep

E4 - QMS Orientation Checklist

E9 - Job Description and Employee Orientation Program

4.6 REFERENCE MATERIALS

None Applicable

5. Element 5 - Document and Records Control

5.1 PROCEDURE DESCRIPTION

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

5.2 REASON FOR PROCEDURE

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

5.3 DEFINITIONS

Documents: Policies, Standard Operating Procedures, Emergency Response Plans, Forms, Regulations, Associated Documents, etc.

Records: Documents containing recorded data such as daily data logs, training records, forms, maintenance records, etc.

Controlled: Considered the most current approved version of a document.

Uncontrolled Copy: For information only. An uncontrolled copy means it may be out of date.

5.4 PROCEDURE

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

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

All QMS documents are to be reviewed annually.

5.5 ASSOCIATED DOCUMENTS

E5 - Document and Records Control Procedure

E5 - Document and Records Spreadsheet

E5 - Document Approval - Change Form

*E5 - Operational Plan Change Spreadsheet

*E19 - Non-Conformance and Corrective Action Report

*E19 - Action Item Request / Opportunity for Improvement Spreadsheet

*QMS - Longterm Spreadsheet

*Are found under the Action Tracking spreadsheet

5.6 REFERENCE MATERIALS

SDWA; O. Reg 170/03

O. Reg 128/04

6. Element 6 - Drinking Water Systems

6.1 PROCEDURE DESCRIPTION

The Town of Goderich, together with OMI Canada Inc - Jacobs (the Operating Authority), provide potable water to the residents and businesses in the Municipality. The Drinking Water System that supplies water is:

- **Goderich Drinking Water System (Water Treatment Subsystem Class 3 and Distribution Subsystem Class 3)**

The distribution system serves the community of Goderich.

The raw water drawn for the Goderich DWS is classified as surface water.

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

6.2 REASON FOR PROCEDURE

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

6.3 DEFINITIONS

None Applicable

6.4 SYSTEM DESCRIPTION

Goderich - Water Works # 21 000 0238

WATER SYSTEM DETAILS

The Goderich Water Supply is characterized as a surface water system and is classified as a Large Municipal Residential System. The system is operated by OMI Canada - Jacobs, the Operating Authority, and provides a potable water supply to the residents and businesses of the Corporation of the Town of Goderich.

The facilities, consisting of a Class III conventional design Water Treatment Plant having an approved rate capacity of 12,000 m³/day, (cubic meters per day) and a Class III water distribution system consisting of a Booster station with a capacity of 5000 m³/day. WaterTower with a capacity of 941 m³/day which are owned by the Town of Goderich and operated by OMI Canada - Jacobs, the Operating Authority.

The system is operated by OM Canada Inc (Jacobs), the Operating Authority, and provides a potable water supply to the residents and businesses of the Corporation of the Town of Goderich.

The raw water for the treatment process is drawn from a surface water source (Lake Huron) located directly west of the town. The raw water is treated by the following processes:

- Pre-chlorination
- Flash Mixing, Flocculation, Coagulation, and Sedimentation
- Filtration and Backwash
- Post-chlorination
- Fluoridation
- Distribution system chlorination

Water is drawn from Lake Huron, from a depth of approximately 5.5 m, approximately 518 m west of the Water Treatment Plant, and is fed by gravity through a 750 mm pipeline to a high traveling raw water screen in the Water Treatment Plant. The water then flows into a two celled concrete low lift pump well.

The major influences on raw water quality are rough lake conditions which can increase turbidity levels rapidly, and weather conditions which can cause a plume of turbid discharge

from the Maitland River, which empties into the lake north of the Water Treatment Plant intake, to be directed over the intake.

Additional potential impacts on raw water could come from operations at Goderich Harbour located North of the intake, and the outfall from the Goderich Sewage Treatment Plant located South of the intake.

The intake of the Plant is situated upstream (north) from the outfall of the Goderich sewage treatment plant and is not influenced by it. The characterization of the raw water from the lake is very good and chemical contamination is not a factor. A complete list of the contents of the source water is available in the First Engineer's Report which was completed by BM Ross and Associates.

Chlorine gas is used from two on-line gas cylinders, with auto switch-over, to treat the water intake (for zebra mussel control if needed) and to provide primary and secondary disinfection. The addition of chlorine gas to the raw water supply is referred to as pre-chlorination and serves primarily as a measure to prevent microbiological growth within the raw water pipeline and the two celled low lift pump well. Pre-chlorine residual is measured continuously in the water leaving the filters.

A coagulant is added to the incoming raw water in the flash mixing tank which is mixed and then flows to two flocculation tanks equipped with walking beam flocculation mechanisms. Detention time allows the formation of floc masses which attract and gather debris present in the influent raw water.

The suspension then flows to two settling tanks equipped with chain and flight sludge collectors. The detention time here allows large particles to settle by gravity in the settling tanks. Supernatant (the clear liquid above the settled floc) overflows from the settling tanks to the top of the dual media filters.

Most of the particulate matter that was present in the raw water is captured by the floc particles and is removed by gravity in the settling tanks, however, during normal operations, some floc passes from the settling tanks to the top of the filters.

The water treatment plant has two parallel dual media filters. The top layer of the filter is granular anthracite, while the filter media below the anthracite layer is sand. As debris accumulates in the filters and limits flow, the filters must be cleaned by reversing the flow

(referred to as backwashing) and directing the backwash to a waste holding tank (settling tank and two sludge lagoons).

Turbidity, a measure of the cloudiness of water, is measured continuously in the effluent from each filter to monitor the effectiveness of the filtration process. If the turbidity rises above a set point value, an alarm warns staff that corrective actions are needed.

Filtered water passes through the filter under-drain into the treated water clearwells. The clearwells are tanks located beneath the filters and are used to store filtered water prior to entering the chlorine contact reservoir.

Primary disinfection (pre-chlorination) occurs before filtration, immediately upstream from the filtered water. Primary chlorination disinfects the water, ensuring that no potentially pathogenic organisms remain after sedimentation and filtration and are rendered harmless prior to distribution to consumers. Consistent disinfection is ensured by continuous monitoring of the chlorine residual at three points in the process of the treated water leaving the facility. If the residual drops below a safe level, pumping to the distribution system is automatically interrupted and an operator is notified to correct the problem.

Secondary disinfection is accomplished during post-chlorination by adding sufficient chlorine at the water treatment plant to maintain a residual throughout the entire distribution system. Secondary disinfection prevents regrowth of microorganisms within the distribution system. Chlorine residual analyzers allow continuous monitoring of chlorine residual in the treatment plant effluent, and in the water upstream of the flash mixer (seasonally, in conjunction with zebra mussel control operation). A provision is available to top up residual chlorine levels using sodium hypochlorite injection at the booster station when required.

A two celled in-ground reservoir containing inlet and outlet diffusers and a baffle wall in each cell is also designed into the system to provide adequate CT (Concentration, mg/L x Time, min) to ensure pathogen removal and disinfection requirements have been met. When calculating CT, the baffle factor is 0.6 mg/L.

The raw water source is low in naturally occurring fluoride, and hydrofluosilicic acid can be added at the post-chlorination point. Equipment is also available to provide continuous

monitoring of fluoride concentrations in the treatment plant effluent and includes a high-level alarm.

Taste and odour control facilities are installed consisting of a powdered activated carbon feed system at the flash mixing tank.

Standby power is provided by a 425 kW diesel generator and automatic transfer switch.

Filter backwash water and accumulated floc from the sedimentation tanks is directed to a waste settling tank from where they are pumped to the settling beds (lagoons).

Treated water is pumped from the high lift pump wells into the distribution sub-system. Distribution piping typically ranges in size from 100 mm to 400 mm in diameter, and may consist of cast iron, ductile iron, concrete, or PVC, depending on the location and date of installation.

One ground level, two cell storage reservoir provides reserve storage with a total capacity of 5,000 m³. The booster station is used to ensure adequate system pressure to zones 1 and 2.

The booster station is used to provide water to zone 2 and in addition supplies water to zone 1 when the Water Treatment Plant is not in operation. An elevated storage tank is also an integral part of the distribution system and used to provide constant pressure for zone 1.

Typical system pressure ranges from 45 P.S.I. to 80 P.S.I., depending on zone and elevation.

Distribution and Elevated Storage Tank

Treated water is pumped from the high lift pump wells into the distribution sub-system. Distribution piping has approximately 77,000 meters of watermain with piping typically ranging in size from 100 mm to 400 mm, and may consist of cast iron, ductile iron, concrete, or PVC, depending on the location and date of installation.

One ground level, two cell storage reservoir provides reserve storage. The attached booster station is used to ensure adequate system pressure to zone 1.

The booster station is used to provide water to zone 2 and in addition supplies water to zone 1 when the Water Treatment Plant is not operational. An elevated storage tank is also an integral part of the distribution system and used to provide relatively constant pressure for zone 1.

Typical system pressure ranges from 45 P.S.I. to 80 P.S.I., depending on zone and elevation.

A two celled in-ground reservoir with a total volume of 2712m³ at maximum water level, containing inlet and outlet diffusers and a baffle wall in each cell is also designed into the system to provide chlorine contact time for CT (Chlorine Contact Time) requirements. When calculating CT, the baffle factor is 0.6.

The raw water source is low in naturally occurring fluoride, and hydrofluosilicic acid is added at the post-chlorination point. Equipment onsite is also to provide continuous monitoring of fluoride concentrations in the treatment plant effluent and includes a high-level alarm.

Taste and odour control facilities are installed consisting of a powdered activated carbon feed system at the flash mixing tank.

SYSTEM FLOWS

The Goderich DWS has one Permit to Take Water (PTTW):

5204-C5JGSY

Expires: August 3, 2031

- Water Treatment Plant: 15,000 L/min (4.2 L/s)

Maximum Total 15890 m³/day

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

The limiting factor regarding flow is chlorine contact time in the two-celled reservoir. In order to meet the regulatory CT requirements (CT value >4), the maximum flow permitted must correspond with a free chlorine residual of **0.60 mg/L**.

SUPERVISORY CONTROL AND DATA ACQUISITION (SCADA) SYSTEM

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

SAMPLING AND TESTING

All sampling and monitoring is carried out in accordance with O. Reg. 170/03, O. Reg. 248/03, as well as the Municipal Drinking Water Licence (MDWL) and Drinking Water Works Permit (DWWP). The SCADA system continuously monitors analyzers for free chlorine residual, pressure and

flow. Weekly, quarterly, annual, 36-month, and 60-month sampling for microbiological and chemical analyses are conducted and sent to accredited laboratories as required in O. Reg. 170/03. SCADA reporting, grab samples, Operator observations, and external laboratory test results are recorded and monitored by Operations staff.

CURRENCY

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

6.5 ASSOCIATED DOCUMENTS

OM-01-1 - Goderich Process and Instrumentation Schematic - 13504-1-FIGURE - 2_3

OM-01-2 - Goderich Pumphouse Schematic - 13504-1-FIGURE-3_3

OM-01-3 - GODERICH DISTRIBUTION Schematic - 13504-1 FIGURE 3-1 - RJB update - Jan 25, 2010

OM-01-4 -GODERICH – Low Pressure Zone Study

OM-01-5 Booster Pumping Station Process Flow Schematic

OM-01-6 Parsons Court Pumping Station and Reservoir High Lift Pump Addition

6.6 REFERENCE MATERIALS

Goderich PTTW #4204-C5JGSY

Goderich MDWL #084-101 issue #4

Goderich DWWP #084-201 issue #6

7. Element 7 - Risk Assessment

7.1 PROCEDURE DESCRIPTION

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

7.2 REASON FOR PROCEDURE

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

7.3 DEFINITIONS

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

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

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

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

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

7.4 PROCEDURE AND MEASUREMENT METHODOLOGY

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

A complete Risk Assessment will be performed every 36 months with as many staff as available. These exercises may also be completed when a significant change occurs in operation such as a new process or change of process/equipment.

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

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

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

Column A - Likelihood	Column B - Severity	Column C - Detectability	Column D - Rating value
<u>Rare</u> : may occur in exceptional circumstances and has not occurred in the past	<u>Insignificant</u> : impact. Little public exposure, little or no health risk	<u>Very Detectable</u> : easy to detect, on-line monitoring through SCADA	1
<u>Unlikely</u> : could occur at some time, historically has occurred less than once every 5- 10 yrs	<u>Minor</u> : limited exposure, minor health risk	<u>Moderately Detectable</u> : alarm present but not in SCADA, may require operator to walk by and notice alarm: problem is indicated promptly by in house lab test results	2
<u>Possible</u> : has occurred or may occur once or more per year	<u>Moderate</u> : minor public exposure, minor health risk	Normally Detectable: visually detectable, but not inspected on a regular basis, lab tests conducted quarterly or longer, not normally detected before a problem becomes evident.	3
<u>Likely</u> : has occurred or may occur on a monthly to quarterly basis	Major: large population at risk	Poorly Detectable: visually detectable, but not inspected on a regular basis, lab tests conducted quarterly or longer, not normally detected before a problem becomes evident	4
<u>Very Likely</u> : one or more occurrences on a monthly or more frequent basis 5	<u>Catastrophic</u> : major impact for large population, complete failure of systems Likely Very Likely	Undetectable: cannot detect until a problem is evident	5

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

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

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

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

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

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

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

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

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

7.5 ASSOCIATED DOCUMENTS

QMS - Longterm Spreadsheet
E7 - Goderich - Risk Assessment - Template
E7 - Goderich - CCP and Risk Assessment Outcomes

7.6 REFERENCE MATERIALS

MECP - Potential Hazardous Events for Municipal Residential Drinking Water Systems
EMO - Hazardous Identification and Risk Assessment (HIRA)

8. Element 8 - Risk Assessment Outcomes

8.1 PROCEDURE DESCRIPTION

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

8.2 REASON FOR PROCEDURE

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

8.3 DEFINITIONS

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

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

8.4 PROCEDURE

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

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

8.5 DEVIATION AND TRACKING

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

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

Critical Control Point (CCP) Limits

Goderich

No.	Hazard	CCP Limit
17	Chemical feed system failure	1.0 mg/L residual alarm and lockout
12	Contamination of the chlorine contact chamber with improperly disinfected water	1.0 mg/L residual alarm and lockout
24	Inadequate chlorine residual in distribution system	residual alarms; 0.55mg/L - Tower 0.80mg/L Booster 1.30mg/L Plant daily residuals, weekly sampling, semi-annual flushing
23	Loss of system pressure	Pressure alarms, backup pumps
27	High lift pump lock-out due to control loss	SCADA and Autodialer alarms

8.6 ASSOCIATED DOCUMENTS

QMS - Longterm Spreadsheet
E7 - Goderich - Risk Assessment - Template
E7 - Goderich - CCP and Risk Assessment outcomes
E20 - Management Review – Template
E20 - Management Review

8.7 REFERENCE DOCUMENTS

None applicable

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

9.1 PROCEDURE DESCRIPTION

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

9.2 REASON FOR PROCEDURE

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

9.3 DEFINITIONS

None Applicable

9.4 PROCEDURE

The structure of the organization is depicted in the OMI Canada Inc -Jacobs Organizational Structure Chart, and The Town of Goderich Organizational Structure Chart. Relevant staff are listed in the DWQMS document.

The Owner and the Operating Authority are responsible for ensuring the safety of the drinking water. The Mayor, Council, and the Director of Public Works represent the Owner and OMI Canada Inc - Jacobs represents the Operating Authority and carries out the operation of the Drinking Water Systems in accordance with all regulatory and QMS requirements.

OMI Canada Inc -Jacobs appoints personnel to assume the roles of Top Management and the QMS Representative as they relate to the Operating Authority and then presented to the Owner.

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

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

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

9.5 ASSOCIATED DOCUMENTS

E9 - Organization Chart – OMI Canada Inc - Jacobs

E9 - Job Responsibilities and Employee Orientation Program

E9 - Organization Chart - The Town of Goderich

9.6 REFERENCE MATERIALS

None applicable

10. Element 10 - Competencies

10.1 PROCEDURE DESCRIPTION

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

10.2 REASON FOR PROCEDURE

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

10.3 DEFINITIONS

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

10.4 PROCEDURE

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

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

Competencies will include factors such as leadership, decision making, cooperation, communication, analyzing situations, learning, applying knowledge, creativity, flexibility, planning, following directions, customer satisfaction focus, adapting to change, handling pressure, and being results focused.

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

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

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

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

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

10.5 ASSOCIATED DOCUMENTS

DWQMS slide presentation
QMS - Longterm Spreadsheet
E4 - QMS Orientation/Training Checklist
E12 - Training Record Form
E 10 Competency Requirement and Training Matrix

10.6 REFERENCE MATERIALS

Employee Training Matrix

Training Record Form

11. Element 11 - Personnel Coverage

11.1 PROCEDURE DESCRIPTION

To identify how The Town of Goderich and OMI Canada Inc -Jacobs ensure that competent personnel are available to fulfil the responsibilities needed for the ongoing operation of its Drinking Water Systems and its Quality Management System (QMS) .

11.2 REASON FOR PROCEDURE

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

11.3 DEFINITIONS

None Applicable

11.4 PROCEDURE

The Water Treatment Plant (WTP) is staffed from Monday to Friday from 7:30 a.m. until 4:30 p.m. and attended on weekends for normal daily rounds.

The Water Treatment Plant Project Manager, or delegate, is the primary Overall Responsible Operator (ORO). Back-up OROs are identified in the shift log, as required.

There is an assigned on-call water treatment plant operator during off-hours as described in the After-Hours Dispatch Procedure for WTP personnel coverage. The on-call operator conducts a physical verification of conditions at the plant once per day during weekends and statutory holidays.

The normal on-call schedule for water treatment plant operators shall be from start time on Tuesday to start time the following Tuesday. The Water Treatment Plant Project Manager establishes and maintains the on-call schedule.

At all times, the Water Treatment Plant is monitored by the SCADA system. The SCADA system has an auto-dialer that has been programmed to contact the Project Manager/Overall Responsible Operator, or personnel designated by the Project Manager, whenever conditions warrant.

The on-call operator is the designated Operator-in-Charge and will respond to and investigate all alarms within 60 minutes.

An Overall Responsible Operator, or designated back-up ORO, is available by cell phone when not physically at the system.

There are regular daily checks of the distribution system conducted by water distribution personnel, and weekend checks of the booster station. The time of the visit and the details of any related action taken are recorded in the on-site daily log.

Procedures are in the WTP Operations Manual.

Table 11.1 provides the schedules for the Operations staff

Table 11.1

Position	Schedule
Project Manager/ORO	At all times
Supervisor	07:30 – 16:00
On-Call Operator (1)	7-day rotation
Water Operator (1)	07:30 - 16:00

11.5 ASSOCIATED DOCUMENTS

OM-16 – After Hours Dispatch/Response to Auto Dialer

11.6 REFERENCE MATERIALS

On-Call Schedule

12. Element 12 - Communications

12.1 PROCEDURE DESCRIPTION

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

12.2 REASON FOR PROCEDURE

To ensure all applicable procedures that apply to internal and external communication related to The Town of Goderich QMS are completed as required.

12.3 DEFINITIONS

None Applicable

12.4 PROCEDURE

The Project Manager / ORO shall ensure that the Owner is provided with a current copy of the Operational Plan. The owner shall also be advised of any changes to the Quality Management System, following revisions, and a status update shall be communicated following Management Reviews. This communication may take place during the regular annual report to Council by the Project Manager, or separate meetings arranged as necessary.

In addition to the Operational Plan, potential changes, and Management Reviews, other relevant information could include audit reviews, risk assessment changes, and provision for infrastructure information. The procedure for this information to be communicated to the Owner will be by the Project Manager to the Owner through the Owner's liaison, at Council Meetings, or Committee Meetings, as applicable.

Operating Authority Personnel will be informed of the QMS and any changes or updates through staff meetings with the Project Manager and/or QMS Representative following the original implementation, and thereafter following the Management Review, or as changes occur. The QMS Policy and Operational Plan are to be posted in the Operations Room for access by all employees.

Essential Suppliers shall receive information regarding the QMS from the Operating Authority as required for purchasing as described in Element 13.

Consumers or the General Public will have access to the QMS policy at the Operating Authority's Water Treatment Plant (WTP) site, as well as at the Municipal Office.

The Owner shall make the Operational Plans available for viewing by the public at the principal office of the owner and at one other publicly accessible location in the geographical area served by the subject system.

Information about the QMS may be added to the Municipal website, as decided by the Owner.

12.5 ASSOCIATED DOCUMENTS

None applicable

12.6 REFERENCE MATERIALS

None applicable

13. Element 13 - Essential Supplies and Services

13.1 PROCEDURE DESCRIPTION

This procedure ensures suppliers and service providers meet all requirements of The Town of Goderich and OMI Canada Inc - Jacobs, to provide safe and reliable drinking water to the residents and businesses within the Township.

13.2 REASON FOR PROCEDURE

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

13.3 DEFINITIONS

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

13.4 PROCEDURE

Essential supplies and services are purchased by the Operating Authority on behalf of the Owner under the direction of the Project Manager.

All essential Chemical, Material, Equipment, and Part Suppliers, and Service Providers must meet the Quality and Performance standards suitable for the production and delivery of safe drinking water to the customer.

Appropriate paperwork must be provided upon delivery to confirm the product being delivered. Where applicable, supplies must meet NSF standards. Chemicals used in the treatment of the drinking water shall have a Certificate of Analysis delivered with each shipment or one must be available from the supplier upon request

Essential suppliers of chemicals and materials must meet NSF / ANSI (National Sanitary

Foundation / American National Standards Institute) and / or AWWA (American Water Works Association) standards. Current versions of these standards are to be reviewed, as required, on the appropriate internet website by Operations or Purchasing personnel.

Ontario legislation requires that Laboratories performing drinking water testing must be accredited for the parameters being tested, and Operating Authorities must use accredited labs as required for testing.

The Project Manager reviews the requirements annually, or as may be required for changes, and suppliers are informed (as required and noted above), by the Project Manager, or designate.

Meetings may be held with contractors and service providers prior to work being carried out on water treatment equipment. They are accompanied by a Water Treatment Operator to ensure water plant and distribution system requirements are understood and met prior to performing their task.

Essential suppliers identified by the OA or Owner receive communications about products or services' quality, quantity, timeframes, certification or accreditation requirements through the procurement and purchase order process and /or by a services supply letter on a 3 year cycle or as new suppliers are required.

3.5 ASSOCIATED DOCUMENTS

E13 - Essential Suppliers and Services Table

E13 - Essential Supplies and Services Letter

13.6 REFERENCE MATERIALS

Municipal Purchasing and Procurement Policy (internal)

14. Element 14 - Review and Provision of Infrastructure

14.1 PROCEDURE DESCRIPTION

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

14.2 REASON FOR PROCEDURE

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

14.3 DEFINITIONS

None Applicable

14.4 PROCEDURE

On an annual basis, a summary of the Water Treatment System is prepared by the Operating Authority's Project Manager / Overall Responsible Operator/Delegate and is submitted to the Owner. Included in the Summary Report is a review and update on the Operating Authority's infrastructure and related programs.

The procedure will be for the Project Manager / Overall Responsible Operator/Delegate to compile information received from Maintenance and Operators throughout the year based on work orders and observations relating to the infrastructure of the water treatment system. This information will be summarized in an Infrastructure section of the annual summary report and presented to the Owner on an annual basis.

During the annual Management Review, participants will discuss all infrastructure topics related to the Drinking Water System. The following topics shall be reviewed:

- a) Drinking Water Quality Trends.
- b) Annual Summary Report.
- c) Watermain replacement and rehabilitation.
- d) Planned maintenance on roads and sewers that will directly affect the Drinking Water Distribution System.
- e) Any issues with annual hydrant flushing, valve operation and/or hydrant maintenance.
- f) Planned maintenance and/or structural updates on the Drinking Water System (treatment or distribution).
- g) Capital budget.
- h) Preventative maintenance program.

-
- i) Long-term forecast of major infrastructure maintenance, rehabilitation and renewal activities.
 - j) Outcome of the 36 month Risk Assessment.
 - k) Town's Asset Management Plan

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

14.5 ASSOCIATED DOCUMENTS

E20 - Management Review - The Town of Goderich

14.6 REFERENCE MATERIALS

The Town of Goderich Asset Management Plan

15. Element 15 - Infrastructure Maintenance, Rehabilitation and Renewal

15.1 PROCEDURE DESCRIPTION

This procedure outlines and defines the process of managing the maintenance, rehabilitation and renewal (MRR) of the Goderich Drinking Water System infrastructure within The Town of Goderich.

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

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

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

15.2 REASON FOR PROCEDURE

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

15.3 DEFINITIONS

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

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

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

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

15.4 PROCEDURE

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

i) Maintenance**PROCEDURE DESCRIPTION**

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

REASON FOR PROCEDURE

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

RESPONSIBILITY

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

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

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

Planned Maintenance

A "CMMS" Maintenance system also generates work orders for routine equipment servicing and preventive maintenance for designated equipment in the water treatment and distribution system.

A summary of key infrastructure material and equipment from the CMMS is generated by the Supervisor or Project Manager / ORO and added to the annual infrastructure summary.

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

Planned maintenance items include, but are not limited to:

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

Unplanned Maintenance

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

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

Staff is required to complete and submit a Corrective Maintenance work order to the Project Manager or designate. Any observations, comments or concerns regarding the equipment and/or maintenance activity shall also be recorded on the Corrective Maintenance work order.

Unplanned maintenance items include but are not limited to:

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

ii) Rehabilitation and Renewal

PROCEDURE DESCRIPTION

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

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

REASON FOR PROCEDURE

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

RESPONSIBILITY

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

- 1) Director of Public Works
- 2) Project Manager/ORO
- 3) Supervisor
- 4) All Operators

PROCEDURE

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

All employees are responsible to identify and communicate infrastructure issues, concerns and opportunities for improvement to management for review. This may occur through monthly summaries, staff meetings, annual reports or corrective action work orders. Information must be communicated with the QMS Representative for reporting and documenting purposes.

15.5 ASSOCIATED DOCUMENTS

E20 - Management Review - The Town of Goderich - Template
OMFS share point: Annual and Summary Reports
CMMS Maintenance Schedule
Corrective Maintenance Work Order – Template

15.6 REFERENCE MATERIALS

The Town of Goderich Asset Management Plan

16. Element 16 - Sampling, Testing and Monitoring

16.1 PROCEDURE DESCRIPTION

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

16.2 REASON FOR PROCEDURE

To ensure sampling, testing and monitoring is conducted to provide safe drinking water for The Town of Goderich Drinking Water Systems.

16.3 DEFINITIONS

None Applicable

16.4 PROCEDURE

The Operating Authority is responsible for establishing and maintaining a Sampling, Testing and Monitoring program that, at a minimum, meets regulatory requirements (O. Reg. 170/03).

The sampling program was developed to ensure that the sample locations used are in areas that are representative of the drinking water provided to the residents, and that an adequate number of samples are collected on a regular basis.

The sampling program and its associated documents are detailed in the Operations Manual.

Competent Operators perform all regulatory sampling requirements. In-house testing results are recorded on monthly log sheets and monitoring, and adjustments notes are made in the logbook (daily grab samples for on-line analyzer comparison and treatment optimization.) Distribution sampling for chlorine residuals and flushing of dead-end mains (as necessary) is also part of the program.

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

All regulatory monitoring requirements are either carried out by the licensed Operators or by the SCADA monitoring software program (DataSoft).

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

The test results are compiled into the Annual Report Data Spreadsheet by the Compliance Coordinator/QMS Rep.

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

16.5 ASSOCIATED DOCUMENTS

E16 - Sampling, Testing and Monitoring Summary Table

OMFS share point: C of Cs (Chain of Custody)

OMFS share point: Blank Forms , Adverse Forms

16.6 REFERENCE DOCUMENTS

Operations Manuals

Contingency Plans

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

17.1 PROCEDURE DESCRIPTION

This procedure describes the method used by The Operating Authority to ensure that all measurement and recording equipment is calibrated and maintained.

17.2 REASON FOR PROCEDURE

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

17.3 DEFINITIONS

Non-Applicable

17.4 PROCEDURE

This procedure is applicable to the following types of equipment in use at facilities operated by The Town of Goderich:

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

The Operator shall conduct, where required, calibration and maintenance of all continuous monitoring and recording equipment, including portable handheld devices. These calibrations shall be recorded into the Calibrations binder.

Specific equipment procedures are available in the Equipment Manufacturer's Manuals, and Users Manuals are available for Operators as required located in the Lab.

Certified sub-contractors are used as required for maintenance and calibration of flow meters, and records maintained.

A summary of the calibration and maintenance requirements for the WTP measurement and recording instruments, including method, frequency, and records, is shown in Measurement and Recording Equipment Calibration Table.

17.5 ASSOCIATED DOCUMENTS

OMFS share point: Annual Calibration of Analyzers

E17 – Measurement and Recording Equipment Calibration Table

17.6 REFERENCE MATERIALS

Operations Manuals

18. Element 18 - Emergency Management

18.1 PROCEDURE DESCRIPTION

This procedure describes the events and risks of The Town of Goderich Drinking Water System that are considered emergencies, as well as those responsible for managing the response and recovery measures.

18.2 REASON FOR PROCEDURE

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

18.3 DEFINITIONS

Emergency: situations or impending situations caused by forces of nature, an accident, or an intentional act that constitutes a danger of major proportions to life and property.

Emergency: a potential situation or service interruption that may result in the loss of the ability to maintain an adequate supply of safe drinking water to consumers.

18.4 PROCEDURE

Some emergency situations that could occur include chemical, biological, or radiological contamination, major distribution line or watermain breaks, interruptions in pressure, or loss of power. The Risk Assessment Outcomes, and Risk Assessment (Associated documents) reference potential emergency situations. Procedures or Contingency Plans related to potential emergency situations can be found in the Operations Manual or Contingency Plan.

A Contingency Plan and Emergency Response Plan for the Operating Authority is available at the Water Treatment Plant listing potential emergencies and the appropriate measures for response, contacts, and how to restore the system to normal operation. WTP Operators and staff are kept up to date with annual reviews of the Operations Manual and Contingency Plan, or as required if changes occur.

It is the responsibility of the Project Manager to ensure that employees are aware of the Contingency Plan and are trained in their responsibilities regarding emergency preparedness.

A list of emergency contacts and essential suppliers and services is kept with the Contingency Plan.

In addition to the above, the Owner has an Emergency Response Plan, in accordance with current legislation and regulations, at the municipal office that provides information and contact information in the case of a water related emergency situation.

Emergency Response Testing can be accomplished by review of one or more Contingency Plan procedures, review of actual emergencies, or by participation in the Municipality's annual emergency exercise. This should be carried out by the Project Manager, or designate, on a regular basis (minimum annually) and followed up in the form of a documented meeting with Operators and employees to ensure awareness of the procedures and allow discussion and input on situations that could arise as an emergency situation.

Operators will be trained on a regular basis according to the QMS Emergency Management Training Procedure and on the contents of the Operations Manuals and Contingency Plans in order to identify and take the appropriate measure to address any emergencies using the specific plans and procedures and providing appropriate notification. The licenced Operator on duty for the system must be capable of identifying and be prepared for responding to any emergency condition that may arise in any of the Drinking Water Systems.

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

The Mayor and Council along with the CAO shall be notified if water quality poses an acute health risk to customers and a Boil Water Advisory or Drinking Water Advisory must be issued. The Mayor and Council, as well as the CAO, Fire Chief and the Director of Public Works, will be primary contacts for all required communication with the public during these emergencies. The Director of Public Works will be responsible for making the notification if deemed necessary.

18.5 ASSOCIATED DOCUMENTS

- QMS - Longterm Spreadsheet
- E7 - Goderich - Risk Assessment –Outcomes
- E18 After action Report/Improvement Plan

18.6 REFERENCE MATERIALS

- The Town of Goderich Emergency Management Plan
- Operations Manuals
- Contingency Plans

19. Element 19 - Internal Audits

19.1 PROCEDURE DESCRIPTION

This procedure defines the process used by The Operating Authority to conduct Internal Audits of the Drinking Water Quality Management System for all the Drinking Water Systems.

19.2 REASON FOR PROCEDURE

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

19.3 DEFINITIONS

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

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

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

19.4 PROCEDURE

The Project Manager, and /or designate, will select audit dates, start an audit file, confirm the audit scope, ensure auditor(s) develop an audit plan and checklist, and advise auditees well in advance of the audit dates.

Internal Audits shall only be conducted by persons having one of the following qualifications:

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

Internal Audits shall be conducted at least once every Calendar year. The scope of the Internal Audit includes all Management Systems and Operations that are applicable to the Drinking Water Systems that fall under the scope of the QMS.

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

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

Corrective Action Requests (CAR's) document a non-conformance that requires action by the auditee and are issued with the audit report. The report of a non-conformance should state the requirement, the non-conformance, and the objective evidence to support the CAR. The CAR can also serve as a source of information for checklists and future audits.

Corrective Action Requests (CARs) should be completed in a timely manner, and follow-up actions reported and filed with the Audit Report files. The internal audit file can be considered closed when CARs have been responded to and agreed to by the Project Manager.

When a non-conformity is identified through the audit process, an action to rectify the issue is developed by Top Management and QMS representative through the action tracking registry (CAR'S, OFI's, Action Items, BMP'S Revisions) Spreadsheet

For initial audit reports a list of potential non-conformances and observations can be provided

Follow-up to the report of observations or non-conformances will be directed by the Project Manager to the appropriate personnel or team to determine the Root Cause of the issue and to develop appropriate corrective actions to prevent future recurrence.

An Audit will consist of the following phases:

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

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

19.5 ASSOCIATED DOCUMENTS

E19 - Internal Audit Report and Checklist

QMS - Longterm Spreadsheet

E19 - 5 Why Root Cause Analysis - Blank Report Form

Non-Conformance and Corrective Actions Report Template

Previous Internal/External Audits

MECP Inspections

19.6 REFERENCE DOCUMENTS

Drinking Water Quality Management Standard

20. Element 20 - Management Review

20.1 PROCEDURE DESCRIPTION

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

20.2 REASON FOR PROCEDURE

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

20.3 DEFINITIONS

None applicable

20.4 PROCEDURE

This procedure is applicable to The Town of Goderich Management, Operating staff, and the Drinking Water System and activities that fall under the scope of the QMS.

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

Management Review Meetings shall include:

- Project Manager
- Supervisor
- QMS Representative/Compliance Specialist
- An operator

The following participants may be added at the discretion of the Project Manager:

- Director of Public Works
- Regional Manager
- Operator(s)
- Maintenance

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

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

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

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

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

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

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

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

20.5 ASSOCIATED DOCUMENTS

QMS - Longterm Spreadsheet (DWQMS-Action Tracker)
E14 - Review and Provision of Infrastructure
E18 - After Action Report/Improvement Plan
E20 - Management Review - The Town of Goderich - Template

20.6 REFERENCE MATERIALS

Drinking Water Quality Management Standard

21. Element 21 - Continual Improvement

21.1 PROCEDURE DESCRIPTION

The Operating Authority will maintain its established Drinking Water Quality Management System by regular review and continual improvement.

21.2 REASON FOR PROCEDURE

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

21.3 DEFINITIONS

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

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

Management Review Action Items (AI): Items identified formally through Element 20 - Management Review process to be acted upon.

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

Opportunities for Improvement (OFI): improvement suggestions.

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

21.4 PROCEDURE

With the use of tools such as Document Change Requests, Corrective Action Requests and Preventative Action Requests, The Operating Authority will modify, update and/or adjust processes and procedures (while remaining in compliance with MECP regulations) to improve operations and customer satisfaction. The review of Best Management Practices (BMPs) at least once every 12 months (including checking the Ministry's Best Practices webpage) will be completed in conjunction with the annual Management Review process.

The QMS Representative will be responsible for maintaining the OFI Tracking Sheet, along with the Preventative and Corrective Actions Tracking Sheet, and Management Review Action Item Tracking Sheet. Preventative and Corrective Actions and OFIs may stem from the Internal and

External Auditing process, MECP Drinking Water Inspections, Management Review and staff suggestions and ideas. OFIs will be discussed, evaluated and ultimately implemented as necessary.

21.5 ASSOCIATED DOCUMENTS

- * OFI Tracking Sheet
- * CAR Tracking Sheet
- Internal/external audits
- MECP Inspection Reports
- Management Review

** Found in the DWQMS-Action Item Tracking sheet*

21.6 REFERENCE MATERIALS

MECP – Best Management Practices