



THE REGIONAL MUNICIPALITY OF NIAGARA
PUBLIC WORKS COMMITTEE
FINAL AGENDA

PWC 12-2019

Tuesday, December 3, 2019

9:30 a.m.

Council Chamber

Niagara Region Headquarters, Campbell West

1815 Sir Isaac Brock Way, Thorold, ON

	Pages
1. <u>CALL TO ORDER</u>	
2. <u>DISCLOSURES OF PECUNIARY INTEREST</u>	
3. <u>PRESENTATIONS</u>	
4. <u>DELEGATIONS</u>	
5. <u>ITEMS FOR CONSIDERATION</u>	
5.1 <u>PW 67-2019</u> 2019 Annual Water and Wastewater Quality Management System Update A presentation will precede consideration of this item.	3 - 170
5.2 <u>PWC-C 29-2019</u> Municipal Councillor Appointments to Greater Niagara Circle Route Committee	171
6. <u>CONSENT ITEMS FOR INFORMATION</u>	
6.1 <u>PW 59-2019</u> GO Implementation Office Update	172 - 176

Appointment of By-law Officers for Enforcement of the Sewer-Use By-law
#27-2014

7. OTHER BUSINESS

8. NEXT MEETING

The next meeting will be held on Tuesday, January 14, 2020 at 9:30 a.m. in the Council Chamber, Regional Headquarters.

9. ADJOURNMENT

If you require any accommodations for a disability in order to attend or participate in meetings or events, please contact the Accessibility Advisor at 905-980-6000 ext. 3252 (office), 289-929-8376 (cellphone) or accessibility@niagararegion.ca (email).



2019 Annual Water and Wastewater Quality Management Systems Update

(Report PW 67-2019)

December 3, 2019

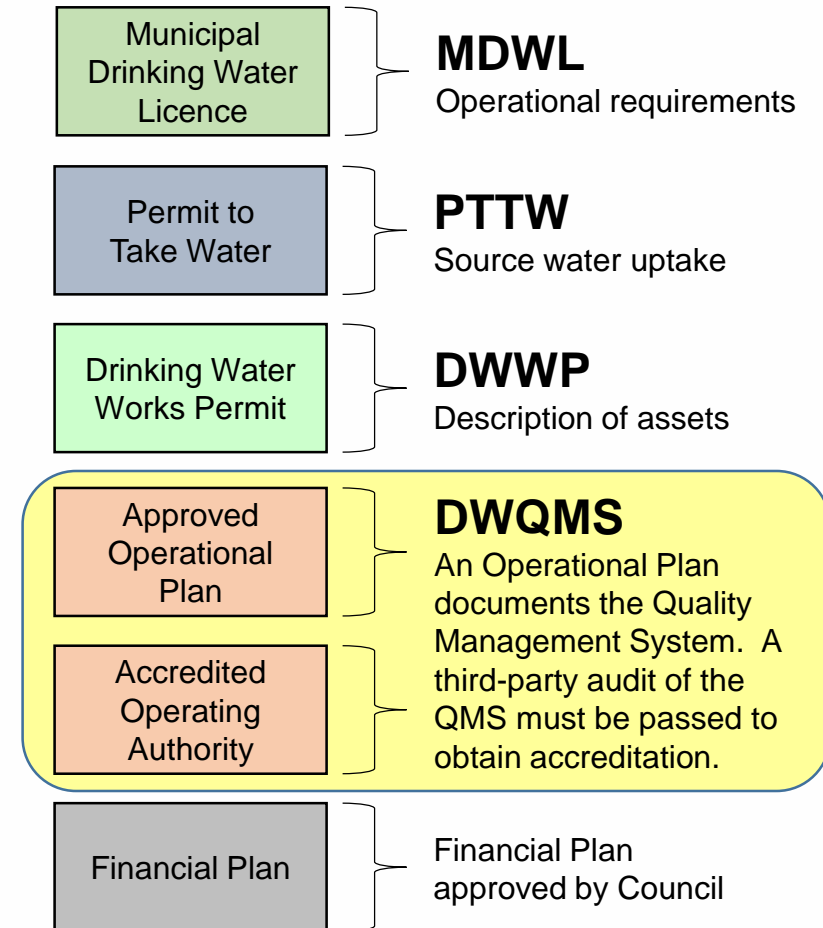
Rachel Whyte, B.A.Sc.

Water and Wastewater Quality Management Specialist

Water Quality Management System (Water QMS)

Water QMS Activities

- Approved Operational Plan and accreditation are required under the *Safe Drinking Water Act*
- Milestones required to maintain accreditation status



Water QMS Internal Audit

- Completed March 2019
- Findings:
 - 12 non-conformances
 - 7 opportunities for continual improvement
 - 22 best practices for evaluation
- Corrective action plans identified by management and staff; implementation ongoing



Water QMS External Audit

- Off-site audit completed May 2018
- No findings identified
- **Upgraded accreditation:**
*Drinking Water Quality
Management Standard, version 2.0*



Water Systems Risk Assessment

- Risk assessment reviews completed for all water systems
- New high-scoring risk identified: mitigation plan in progress
- Critical control points remain unchanged
- Review in 2020, re-assess in 2021



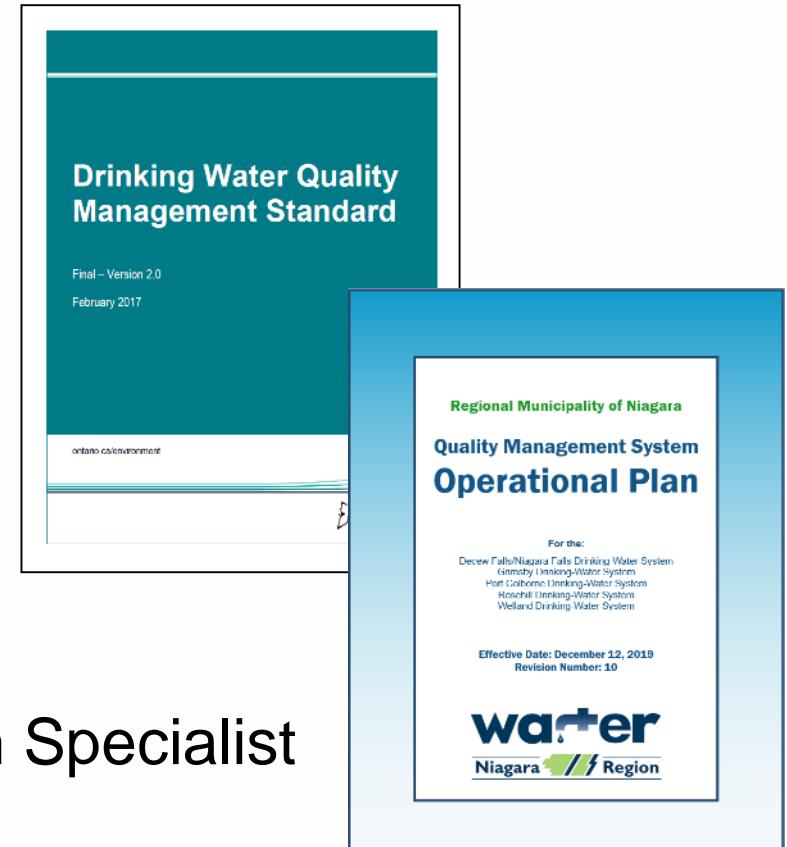
Water QMS Management Review

- Part 1 completed in May
- Part 2 anticipated in December
- 9 action items issued since previous update
- Action item resolutions in progress



Changes Impacting Water QMS/ Operational Plan

- Changes impacting QMS:
 - Accreditation upgraded (version 2.0)
- Changes impacting Operational Plan:
 - New position:
Associate Director, Asset Management
(*member of QMS Top Management*)
 - New position:
second W-WW Quality Management System Specialist
(*new Backup QMS Representative*)
- Requesting Council re-endorsement of Operational Plan



Wastewater Quality Management System (Wastewater QMS)

Wastewater QMS Internal Audit

- Completed October 2019
- Findings:
 - 23 non-conformances
 - 29 opportunities for continual improvement
- Corrective action plans identified by management and staff; implementation ongoing



Wastewater Systems Risk Assessment

- Re-assessment of wastewater systems completed in 2018
- 102 high-risk items identified:
 - Significant number of wastewater assets
 - Significant infrastructure needs
- 70 high-scoring risks to be mitigated through capital improvements
- Next full re-assessment in 2021



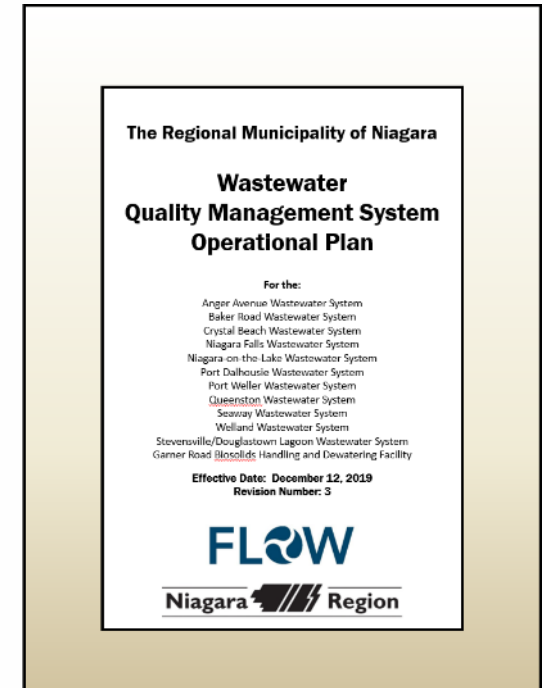
Wastewater QMS Management Review

- Part 1 completed in March
- Four action items identified:
 - Wastewater compliance
 - Staff suggestions/
customer complaints
 - Emergency management
 - Continual improvement
- Action item resolutions in progress



Changes Impacting Wastewater QMS/ Operational Plan

- Changes impacting QMS:
 - New standard in development – voluntary adoption
- Changes impacting Operational Plan:
 - New position:
Associate Director, Asset Management
(*member of QMS Top Management*)
 - New position:
second W-WW Quality Management System Specialist
(*new Wastewater QMS Representative*)
- Requesting Council re-endorsement of Operational Plan



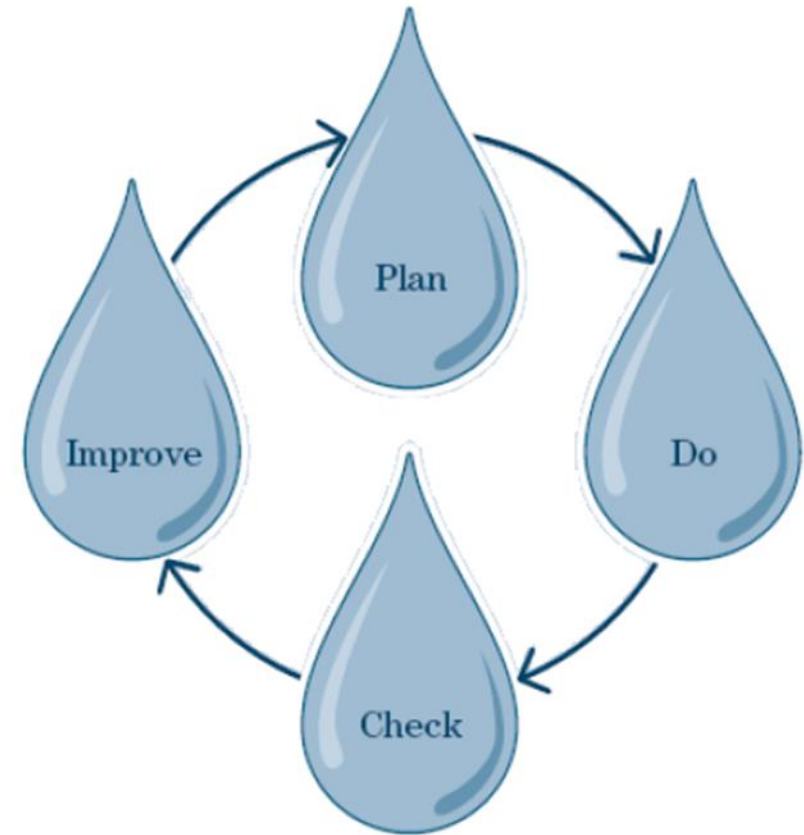
Questions

Rachel Whyte, B.A.Sc.

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Subject: 2019 Annual Water and Wastewater Quality Management System Update

Report to: Public Works Committee

Report date: Tuesday, December 3, 2019

Recommendations

1. That Report PW 67-2019 **BE RECEIVED** for information as the Water and Wastewater Quality Management System (QMS) – Annual Update;
2. That the 2019 Water QMS Internal Audit Report, the 2019 Water QMS External Audit Report, and the 2019 Wastewater QMS Internal Audit Report **BE RECEIVED** for information;
3. That the Water Quality Management System Operational Plan and the Wastewater Quality Management System Operational Plan **BE APPROVED** and **ENDORSED**; and
4. That the Regional Chair and Regional Clerk **BE AUTHORIZED** to sign the Operational Plans on behalf of Council as evidence of Council's endorsement.

Key Facts

- The purpose of this report is to provide a summary outlining the main processes and work performed internally to support the Water-Wastewater Division's Water QMS, as required under the *Drinking Water Quality Management Standard* (the *Standard*), and the Wastewater QMS.
- The *Standard* is created under the *Safe Drinking Water Act, 2002* and requires Drinking Water System Owners to implement and maintain an accredited QMS. Niagara Region has maintained accreditation to this Standard since 2009.
- Niagara Region is not legally mandated to implement a QMS for wastewater services, however, the division has elected to do so as a due diligence measure.
- The previous term of Regional Council requested that internal and external audit reports relating to the Water QMS and Wastewater QMS be provided for information.
- The Water QMS and the Wastewater QMS Operational Plans were previously endorsed by Council on March 28, 2019 under PW 19-2019, Drinking Water Compliance and Water Wastewater Quality Management System Endorsement. Since that time, the Operational Plans have been updated to reflect staffing changes in key QMS roles (Top Management, QMS Representative) and are thus presented again today for re-endorsement.

Financial Considerations

A total of approximately \$29,500 (including non-recoverable HST) in quality management system program costs have been incurred in 2019 to-date. Costs include maintenance and support fees for software used in support of the QMS, and consulting fees for an off-site external accreditation audit of the Water QMS. These costs were included in the 2019 approved operating budget for Water Operations.

An allocation of approximately \$33,000 has been included in the proposed 2020 operating budget.

Analysis

This annual update summarizes the outcomes of significant quality management activities that are conducted in support of the Water QMS and Wastewater QMS, as well as internal and/or external changes that may impact either QMS.

Water QMS

The *Safe Drinking Water Act, 2002* mandates the development, implementation, and accreditation of a drinking water quality management system as a condition of issuance of a municipal drinking water licence. Niagara Region holds five municipal drinking water licences, one for each of its drinking water systems; thus, we are legally required to maintain accreditation of our Water QMS.

Roles and Responsibilities – Water QMS

Water QMS roles, as described in this report and documented in the Water QMS Operational Plan, are assigned in Table 1.

Table 1: Roles and Responsibilities – Water QMS

Role	Assignment
System Owner	Niagara Region (represented by Regional Council)
Operating Authority	Niagara Region (represented by staff of the Water and Wastewater Services Division)
Top Management	Commissioner of Public Works Director, Water and Wastewater Services Division Associate Director, Water Operations & Maintenance Associate Director, Water-Wastewater Engineering Associate Director, Water-Wastewater Integrated Systems Associate Director, Water-Wastewater Asset Management

Role	Assignment
QMS Representatives	Water-Wastewater Quality Management Specialist, reporting to Manager, Water Quality & Compliance (<i>primary</i>) Water-Wastewater Quality Management Specialist, reporting to Manager, Wastewater Quality & Compliance (<i>backup</i>)

Owner Roles and Responsibilities – Water QMS

An owner endorsement of the Water QMS Operational Plan is a requirement of our Water QMS accreditation. The Water QMS Operational Plan was endorsed by the current term of Regional Council on March 28, 2019 under PW 19-2019, Drinking Water Compliance and Water Wastewater Quality Management System Endorsement.

As Owners of Niagara Region's drinking water systems, Regional Council has specific responsibilities as defined within the *Safe Drinking Water Act, 2002*. A significant one of these is the "Standard of Care" clause (section 19 of the *Act*); the clause requires Councillors to "exercise the level of care, diligence and skill in respect of a municipal drinking water system that a reasonably prudent person would be expected to exercise in a similar situation" and to "act honestly, competently and with integrity, with a view to ensuring the protection and safety of the users of the municipal drinking water system".

Internal Audits of the Water QMS

The Water QMS is subject to annual internal audits by water and wastewater staff. All internal auditors have completed applicable training led by a qualified and competent trainer. Through the audit process, internal auditors assess conformance of the division's Water QMS with Ontario's *Drinking Water Quality Management Standard* and with divisional policies and procedures.

Three processes were selected for internal auditing:

- Emergency management;
- Preventive maintenance;
- Sampling, testing and monitoring of raw, process, and treated water.

The division's internal audits are more rigorous and thorough than the external audit process, and the number and detail of audit findings demonstrates this. The internal audit findings include 12 non-conformances, 7 potential non-conformances/opportunities for improvement, and 22 best practices. These findings are detailed in the Water QMS Internal Audit Report (Appendix 1 to this report).

External Audits of the Water QMS

The Water QMS is also subject to external auditing by a third-party auditor as a means to achieve and maintain accreditation to the Standard. Accreditation of the Water QMS is a condition of the Region's Municipal Drinking Water Licences: without continued accreditation, these licences would be revoked.

An off-site surveillance audit was conducted in May 2019 to confirm that the Water QMS adequately addresses the requirements of all 21 elements of the Standard. This audit also marked an upgrade to version 2.0 of the Standard, released by the then-Ministry of the Environment and Climate Change (now, the Ministry of the Environment, Conservation, and Parks) in February 2017. The Water QMS External Audit Report (Appendix 2) provides details of the external auditor's findings. The auditor recommended that Niagara Region maintain its accreditation as a Drinking Water System Operating Authority, with no non-conformances or opportunities for improvement identified.

Water QMS Risk Assessment

An internal risk assessment is required every 36 months for each of Niagara Region's water systems, with complementary risk assessment reviews to be completed at 12 and 24 months between the assessments. The last full risk assessment for the Water QMS was completed in 2018, with a review completed in 2019.

The following high-scoring risks were identified during the 2019 review:

- *Failure of raw water intake (Rosehill Water Treatment Plant):* This was identified as a risk due to the age of the intake pipe, which was installed in 1960. The intake shows signs of age-related failure. An environmental assessment has been initiated to replace the intake, with plans to extend it further into Lake Erie.
- *Sodium bisulphite systems (Decew Falls Water Treatment Plant and Grimsby Water Treatment Plant):* This was identified as a risk due to ongoing issues with the performance of the sodium bisulphite dosing systems at the two subject treatment plants. Sodium bisulphite is used to dechlorinate process waste streams before they are discharged to the environment. There is a potential for chlorinated water to be discharged to the environment if the dosing system fails; such an event could have environmental impacts in the receiving water body and/or compliance impacts for Niagara Region. **It is important to note that the sodium bisulphite systems treat waste streams only; thus, they do not impact the safety of treated drinking water.** Since completion of the 2019 risk assessment review, the system at the Grimsby Water Treatment Plant has been improved and is functioning as intended. The system at the Decew Water Treatment Plant continues to be examined, with some improvements planned.

The Region's "critical control points", representing critical process steps, remain unchanged following the 2018 risk assessment. The critical control points include:

- Coagulant feed
- Filter effluent turbidity
- Disinfectant feed
- Primary disinfection
- Secondary disinfection

Risks associated with these critical control points are all low-scoring, as they are well-controlled with existing preventive measures and monitoring/response procedures.

Water QMS Management Review

Water QMS Top Management and the QMS Representative meet twice per year to complete a QMS Management Review as required by the *Standard*. At these meetings, Top Management reviews the status of the QMS and identifies corrective actions and continual improvement opportunities to enhance the QMS and associated operations.

Part 1 of the 2019 Management Review was completed on May 31, 2019; Part 2 was scheduled to be completed on November 28, 2019.

Action items identified at the Management Review meetings are summarized in Table 2.

Table 2: Management Review Meetings and Results

Review Meeting	Date	Results
Part 1 – 2018	Jun. 4, 2018	Four action items: <ul style="list-style-type: none"> - Health and safety - Water quality - Staff suggestions - Resources for QMS
Part 2 – 2018	Dec. 10, 2018	Five action items: <ul style="list-style-type: none"> - Water quality - Emergency management (2) - Changes impacting QMS (2)
Part 1 – 2019	May 31, 2019	Four action items: <ul style="list-style-type: none"> - Infrastructure review - Emergency management - Continual improvement (2)
Part 2 – 2019	Nov. 28, 2019	<i>To be reported in 2020 QMS Update to PWC</i>

Changes Impacting the Water QMS

Version 2.0 of the *Drinking Water Quality Management Standard* was released on April 6, 2017; significant revisions to the *Standard* were previously presented in Report PW 52-2017, *Water and Wastewater Quality Management Systems – Update*. Conformance with Version 2.0 of the Standard is required by year-end 2019 and was achieved in May 2019 with completion of the annual Water QMS external audit.

Wastewater QMS

The Water-Wastewater Services Division has opted to develop and implement a Wastewater QMS as a due diligence exercise. The benefits of the Wastewater QMS are numerous and include documentation of policies and procedures, a formalized risk assessment program, incorporation of compliance requirements into standard operating procedures, and an audit program that promotes continual improvement of quality management practices.

Roles and Responsibilities – Wastewater QMS

Wastewater QMS roles, as described in this report and documented in the Wastewater QMS Operational Plan, are assigned in Table 3.

Table 3: Roles and Responsibilities – Wastewater QMS

Role	Assignment
System Owner	Niagara Region (represented by Regional Council)
Operating Authority	Niagara Region (represented by staff of the Water and Wastewater Services Division)
Top Management	Commissioner of Public Works Director, Water and Wastewater Services Division Associate Director, Wastewater Operations & Maintenance Associate Director, Water-Wastewater Engineering Associate Director, Water-Wastewater Integrated Systems Associate Director, Water-Wastewater Asset Management
QMS Representatives	Water-Wastewater Quality Management Specialist, reporting to Manager, Wastewater Quality & Compliance (<i>primary</i>) Water-Wastewater Quality Management Specialist, reporting to Manager, Water Quality & Compliance (<i>backup</i>)

Internal Audits of the Wastewater QMS

Like the Water QMS, the Wastewater QMS is also subject to annual internal audits by water and wastewater staff. All internal auditors have completed applicable training led by a qualified and competent trainer. Through the audit process, internal auditors assess conformance of the division's Water QMS with Ontario's *Drinking Water Quality Management Standard* (as modified to suit wastewater operations) and with divisional policies and procedures.

The following audits were undertaken in 2019:

- Audit of the process for bypass, spill, and overflow notification and reporting;
- Element-specific audits to examine processes relating to Owner/Top Management commitment and endorsement; QMS Representative responsibilities; infrastructure review; infrastructure maintenance, rehabilitation, and renewal; equipment calibration; emergency management; internal auditing; management review; and continual improvement.

The internal audit findings include 23 non-conformances and 29 potential non-conformances/opportunities for improvement. These findings are detailed in the Wastewater QMS Internal Audit Report (Appendix 3 to this report). Best practice identification has not been undertaken in Wastewater QMS audits to-date, but will be included in future audits.

External Audits of the Wastewater QMS

There is no accreditation requirement in place for the Wastewater QMS, thus, there is no corresponding program in place for external auditing of the Wastewater QMS.

Wastewater QMS Risk Assessment

An internal risk assessment is completed every 36 months for each of Niagara Region's wastewater systems, with complementary risk assessment reviews to be completed at approximately 12 and 24 months between the assessments. The last full risk assessment for the Wastewater QMS was completed in fall 2018.

A total of 102 high-risk items were identified during the 2018 review. This significant number of high-scoring risks is reflective of the region's massive inventory of wastewater assets (12 treatment facilities, a biosolids treatment facility, and 112 sewage pumping stations) and the critical need for infrastructure improvement in wastewater operations. Seventy (70) of the 102 high-scoring items from the risk assessment will be mitigated through ongoing or upcoming capital projects, further highlighting the need for capital improvements to wastewater system infrastructure.

The 2019 risk assessment review is currently in progress; results will be reported in the 2020 Quality Management System update report to Public Works Committee.

Wastewater QMS Management Review

Wastewater QMS Top Management and the QMS Representative meet twice per year to complete a QMS Management Review as required by the *Standard*. At these meetings, Top Management reviews the status of the QMS and identifies corrective actions and continual improvement opportunities to enhance the QMS and associated operations.

Part 1 of the 2019 Management Review was completed on March 27, 2019; Part 2 is scheduled to be completed on November 12, 2019.

Action items identified at the Management Review meetings are summarized in Table 4.

Table 4: Management Review Meetings and Results

Review Meeting	Date	Results
Part 1 – 2018	Feb. 6, 2018	Five action items: <ul style="list-style-type: none"> - Risk assessment - Maintenance (2) - Infrastructure review - Continual improvement
Part 2 – 2018	Oct. 19, 2018	Three action items: <ul style="list-style-type: none"> - Wastewater compliance - Continual improvement - Changes impacting QMS
Part 1 – 2019	Mar. 27, 2019	Four action items: <ul style="list-style-type: none"> - Wastewater compliance - Staff suggestions/customer complaints - Emergency management - Continual improvement
Part 2 – 2019	Nov. 12, 2019	<i>To be reported in 2020 QMS Update to PWC</i>

Changes Impacting the Wastewater QMS

The Ministry of the Environment, Conservation, and Parks (MECP) has indicated that a quality management standard will be developed for wastewater systems. Unlike the *Drinking Water Quality Management Standard*, conformance and accreditation to the *Wastewater Management Standard* will be voluntary. Development of the *Wastewater*

Management Standard is industry-driven and is still in very early stages; as such, there is no forecasted date for its publication.

Governmental Partners

Drinking water system Operating Authority staff work closely with the MECP to ensure that comments and concerns related to current and future drafts of the *Drinking Water Quality Management Standard* have been considered. When changes are made to the *Standard*, they are incorporated into the Region's Water QMS and are also considered for incorporation into the Wastewater QMS as relevant and/or feasible.

Water and Wastewater Operating Authority staff meet quarterly with Area Municipal counterparts to share resources, experiences, and best practices pertaining to water and wastewater quality management and compliance.

Public and/or Service Users

The Water QMS Policy, Water QMS accreditation information, and Wastewater QMS Policy are available to the public and service users via the Niagara Region's external website.

The most current approved versions of Operational Plans are available upon request to a Water-Wastewater Quality Management Specialist (rachel.whyte@niagararegion.ca or michelle.max@niagararegion.ca).

Updates to the Water and Wastewater QMS Operational Plans

The Water QMS Operational Plan and Wastewater QMS Operational Plan were revised in early 2019 and were re-endorsed by the new term of Regional Council on March 28, 2019 under Report PW 19-2019, Drinking Water Compliance and Water-Wastewater Quality Management System Endorsement. Water-Wastewater Services has since undergone a divisional reorganization, including the creation of two new positions that directly impact the Water QMS and Wastewater QMS:

- The new **Associate Director, Asset Management** has been identified as a member of Top Management for both the Water and Wastewater QMS. Top Management is identified as "a group of people at the highest management level within an Operating Authority that makes decisions respecting the QMS and recommendations to the Owner respecting the subject systems".
- A **Water-Wastewater Quality Management Specialist** has been added to the staff complement, reporting to the Manager, Quality and Compliance – Wastewater. This Quality Management Specialist acts as the primary QMS Representative for the Wastewater QMS and fulfills the specific responsibilities for the Wastewater QMS as outlined in the Wastewater QMS Operational Plan.

The Quality Management Specialist (Wastewater) also replaces the Water Compliance Specialist as the alternate QMS Representative for the Water QMS.

The Operational Plans have been revised to incorporate these changes to key QMS roles. Accompanying this report, Public Works Committee members have received copies of the Operational Plans for approval and endorsement as follows:

- Niagara Region's Water Quality Management System Operational Plan (included as Appendix 4);
- Niagara Region's Wastewater Quality Management System Operational Plan (included as Appendix 5).

For the Water QMS, endorsement of Niagara Region's Operational Plan is a requirement for accreditation to the *Drinking Water Quality Management Standard*.

Alternatives Reviewed

The Ministry of the Environment, Conservation, and Parks has appointed two accreditation bodies under Part IV of the Safe Drinking Water Act, 2002. Niagara Region appointed QMI-SAI Global for Water QMS accreditation services in 2013.

Relationship to Council Strategic Priorities

Niagara Region's Water and Wastewater Quality Management Systems, and associated audit processes, relate directly to Council's Strategic Priority 4.1 of committing to "high quality, efficient and coordinated core services". The Water QMS and Wastewater QMS are used to drive continual improvement within the Water and Wastewater Services Division; they increase accountability by defining clear roles and responsibilities for divisional staff, and they increase data accessibility through documented standard operating procedures and associated record-keeping practices.

The Water QMS and Wastewater QMS also relate to Council's Strategic Priority 4.2 of committing to "enhanced communication". The continued accreditation of the Region's Water QMS provides residents with assurance that their drinking water is safe and that the associated systems are managed with competence and diligence.

Other Pertinent Reports

- PWA 109-2008, DWQMS Update (October 29, 2008).
- PW 52-2017, Water and Wastewater Quality Management Systems – Update (November 28, 2017).
- PW 19-2019, Drinking Water Compliance and Water Wastewater Quality Management System Endorsement (March 28, 2019).

Prepared by:

Rachel Whyte, B.A.Sc.
W-WW Quality Management Specialist
Public Works

Recommended and Submitted by:

Ron Tripp, P.Eng.
Acting Chief Administrative Officer

This report was prepared in consultation with Pamela Hamilton, Program Financial Specialist, and reviewed by Deanna Barrow, P. Eng., Manager, Water Quality and Compliance; Jason Oatley, B.Sc., C. Chem., Manager, Wastewater Quality and Compliance; and Joe Tonellato, P. Eng., Director of Water & Wastewater Services.

Appendices

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INTERNAL AUDIT REPORT

Emergency Management

Preventive Maintenance

Sampling, Testing, and Monitoring

General

**Niagara Region
All Drinking
Water Systems
Internal Audit
Areas 1, 2 and 3**

Operations

Top Management

Maintenance

QMS Representative

Support Staff

March 11 – 15, 2019



2019 INTERNAL AUDIT REPORT

Emergency Management – Preventive Maintenance – Sampling, Testing, and Monitoring

1.0 INTRODUCTION

1.1 Purpose

The purpose of the 2019 internal audit was to verify that the QMS conforms to the requirements of the DWQMS and the Water QMS Operational Plan and that the QMS has been effectively implemented and properly maintained for all five of Niagara Region's drinking water systems.

Audits were completed between March 11 and March 15, 2019. Audits were conducted at six water treatment plants (WTPs), including the Niagara Falls and Rosehill WTPs (Area 1), the Welland and Port Colborne WTPs (Area 2), and the DeCew Falls and Grimsby WTPs (Area 3). Internal audits were also conducted with staff of Integrated Systems, members of Top Management, and other support staff.

1.2 Scope

The internal audit for 2019 was conducted as a process audit in which auditors examined the elements of the DWQMS that related to selected QMS process. The processes selected to be audited included:

- Emergency Response (Integrated Systems, Areas 1, 2, 3);
- Preventive Maintenance (Integrated Systems, Areas 1, 2, 3);
- Sampling Testing and Monitoring (Integrated Systems, Areas 1, 2, 3);
- General (all working groups).

The following elements were examined as part of this internal audit:

- Element 1 – Quality Management System
- Element 2 – Quality Management Policy
- Element 3 – Commitment and Endorsement
- Element 4 – QMS Representative
- Element 5 – Documents and Records Control
- Element 7 – Risk Assessment
- Element 9 – Organizational Structure, Roles, Responsibilities and Authorities
- Element 10 – Competencies
- Element 11 – Personnel Coverage

2019 INTERNAL AUDIT REPORT

Emergency Management – Preventive Maintenance – Sampling, Testing, and Monitoring

- Element 12 – Communications
- Element 14 – Review and Provision of Infrastructure
- Element 15 – Infrastructure Maintenance, Rehabilitation and Renewal
- Element 16 – Sampling, Testing and Monitoring
- Element 17 – Measurement & Recording Equipment Calibration and Maintenance
- Element 18 – Emergency Management
- Element 19 – Internal Audits
- Element 21 – Continual Improvement

Elements 6 (Drinking Water System), 8 (Risk Assessment Outcomes), 13 (Essential Supplies and Services), and 20 (Management Review) were not audited during the 2019 internal audit. These elements will be included in future internal audits.

1.3 Selection of Internal Audit Team

Internal auditors for the 2019 audit were:

- **Area 1:** Deanna Barrow, Keith Lepine
- **Area 2:** Rachel Whyte, Jennifer McDowell
- **Area 3:** Dave Haley, Clayton Nadeau
- **Other** (Top Management, Integrated Systems, Engineering, Support Staff): Deanna Barrow, Janet Rose

All internal auditors have completed Internal Auditor Training as required by the **Internal Audit Procedure** (QMS-WT-ALL-P-190, rev7, effective July 26, 2018).

1.4 Criteria and Methodology

Audit criteria included the following:

- **Internal Audit Procedure** (QMS-WT-ALL-P-190, rev7, effective July 26, 2018);
- **Niagara Region Water Operational Plan** (QMS-WT-ALL-MAN-010, rev8, effective August 24, 2018) and supporting procedures; and
- Internal audit training materials (various auditor training courses).

Audits were conducted by assigned auditors as noted in Section 1.3 of this audit report. Top Management and other support staff were also interviewed by assigned auditors. An opening meeting was held at each of the audit interviews. Auditor checklists were

2019 INTERNAL AUDIT REPORT

Emergency Management – Preventive Maintenance – Sampling, Testing, and Monitoring

completed and reviewed with the Lead Auditor. These checklists are not attached to this Audit Report, but are retained as per **Document & Records Control** (QMS-WT-ALL-P-050, rev7, effective Feb. 8, 2017).

1.5 Summary of New Internal Audit Findings

The classification of internal audit findings has changed slightly since the previous internal audit. The changes align with updates to Element 21 of the Drinking Water Quality Management Standard¹, “Continual Improvement”.

Findings are categorized as follows:

- **Non-conformance:** A requirement of the Drinking Water Quality Management Standard or a documented Standard Operating Procedure is not being met. These findings require **corrective action**.
- **Potential non-conformance:** A non-conformance has not yet occurred, but a trend or pattern indicates that occurrence of a non-conformance is likely. These findings require **preventive action**.
- **Best practice for evaluation:** A best practice behaviour or opportunity for improvement is identified. These findings are brought forward to the appropriate level of management for review and consideration, and those requiring Top Management direction or input are reviewed at the annual Management Review.

Audit findings included the following:

- **Twelve** non-conformances relating to Elements 5 (Document and Records Control), 10 (Competencies), 15 (Infrastructure Maintenance, Rehabilitation, and Renewal), 16 (Sampling, Testing and Monitoring), 18 (Emergency Management), 19 (Internal Audits), and 21 (Continual Improvement).
- **Seven** potential non-conformances relating to Elements 5 (Document and Records Control), 10 (Competencies), 15 (Infrastructure Maintenance, Rehabilitation and Renewal), 16 (Sampling, Testing and Monitoring), and 18 (Emergency Management).
- **Twenty-two** best practices for evaluation relating to Elements 5 (Document and Records Control), 7 (Risk Assessment), 10 (Competencies), 11 (Personnel Coverage), 12 (Communications), 15 (Infrastructure Maintenance, Rehabilitation

¹ Updates made under Version 2.0 (February 2017).

2019 INTERNAL AUDIT REPORT

Emergency Management – Preventive Maintenance – Sampling, Testing, and Monitoring

and Renewal), 18 (Emergency Management), 19 (Internal Audits) and 21 (Continual Improvement).

Details of all of the above findings are provided in Table 1 (see Section 2.1 of this Audit Report).

1.6 Review of Previous Internal Audit Findings

There were eight Corrective Action Reports (CARs) issued in relation to non-conformances from the 2017 Internal Audit (records **WTCAR-18-001** through **WTCAR-18-008**). **WTCAR-18-004** and **WTCAR-18-008** have been resolved; the other six CARs remain open.

1.7 Review of Previous External Audit Findings

There were no findings identified in the 2018 external audit.

1.8 Audit Interviews

The following Regional staff were interviewed as part of the Internal Audit:

- John Brunet, Area 1 Water Operations Manager
- Tim Peyton, Area 1 Water System Maintenance Manager
- Liviu Turcu, Area 1 System Operator
- Robert Weaver, Area 1 System Operator
- Jocelyn Williams, Area 1 System Operator
- Tom Pierrynowski, Area 1, System Operator
- Adam Bartol, Area 1, System Maintenance Assistant
- Bill Szigeti Area 1 - System Maintenance Assistant I
- Rick Sheppard, Area 2 System Operator
- Zoli Mod, Area 2 Water System Maintenance Manager
- Laura Teeple, Area 2 System Operator
- Jason Wiens, Area 2 System Operator
- Rick Sheppard, Area 2 System Operator
- Allyssa Addis, Area 2 System Operator
- David Iannandrea, Area 2 System Maintenance Assistant II
- Jordan Cadieux, Area 2 System Maintenance Assistant I

2019 INTERNAL AUDIT REPORT

**Emergency Management – Preventive Maintenance –
Sampling, Testing, and Monitoring**

- Rick Johnston, Area 2 System Maintenance Person
- Adrian Rittner, Area 3 Water Operations Manager
- Adam Allcock, Area 3 Water System Maintenance Manager
- Allison Miller-Graves, Area 3, System Operator
- Eamon Kerrigan, Area 3 System Operator
- Rob Middlemiss, Area 3 System Operator
- Rich Ledoux, Area 3 System Operator
- Jeff Laurin, Area 3 Certified Industrial Mechanic
- Cody Cosby, Area 3 System Maintenance Person
- Bill McKelvey, Area 3 System Maintenance Assistant II
- Rob Sauder, Area 3 System Maintenance Assistant I
- Ray Waters, CMMS System Administrator
- Jennifer McDowell, Maintenance Asset Analyst
- Scott Gabel, Manager W-WW Skilled Trades – Electrical
- Berny Portolesi, Manager W-WW Skilled Trades – Instrumentation
- Carrie Brunet, W-WW Training Advisor
- Mike Janas, AD Water Operations and Maintenance (Top Management)
- Craig Courteau, AD W-WW Integrated Systems (Top Management)
- Tony Cimino, AD W-WW Engineering (Top Management)
- Joe Tonellato, Director, Water and Wastewater (Top Management)
- Rachel Whyte, W-WW Quality Management Specialist (QMS Rep.)

2019 INTERNAL AUDIT REPORT

Emergency Management – Preventive Maintenance – Sampling, Testing, and Monitoring

2.0 INTERNAL AUDIT RESULTS

2.1 Summary of QMS Internal Audit Findings

Table 1 provides a summary of findings from the QMS Internal Audit. In reviewing Table 1, the following acronyms should be noted:

Acronym	Definition
C	Conformance
NC	Non-Conformance
PNC	Potential Non-Conformance
BP	Best Practice for Evaluation
N/A	Not applicable – did not audit this element

Table 1 is provided below.

Table 1 : Summary of Findings – 2019 Internal Audit

Finding	DWQMS Standard Element	Number
Element 1: Operational Plan		
C	QMS conforms to the requirements of this element.	---
Element 2: QMS Policy		
C	QMS conforms to the requirements of this element.	---
Element 3: Commitment and Endorsement		
C	QMS conforms to the requirements of this element.	---
Element 4: QMS Representative		
C	QMS conforms to the requirements of this element.	---

2019 INTERNAL AUDIT REPORT

Emergency Management – Preventive Maintenance – Sampling, Testing, and Monitoring

Finding	DWQMS Standard Element	Number
Element 5: Document and Records Control		
NC	<p><i>Document and Records Control (QMS-WT-ALL-P-050, rev7, 8Feb2017)</i> states that “controlled printed documents that are obsolete are removed from use and replaced with the current printed version”. The following emergency response documents were found to be out of date in controlled hard-copy ERP binders distributed to staff:</p> <ul style="list-style-type: none"> • <i>ERP Contact List (ERP-ALL-ALL-T-002)</i>: Current is Jan 2019, binders contain versions from Jan2017 or Dec2017. • <i>Threat to a Water or Wastewater Facility, System, or Supply (ERP-ALL-ALL-P-002)</i>: Current version is rev2 (24Oct2017), binders contain rev1. • <i>Watermain Break (ERP-WT-ALL-P-011)</i>: current version is rev3 (22Aug2018), binders contain rev2. • <i>Watermain Break Repair (OP-WT-ALL-P-033)</i>: current version is rev1 (22Aug2018), binders contain rev0. • <i>Emergency Laboratory Services for Non-Bacteriological Sampling (OP-WT-ALL-P-014)</i>: current version is rev6 (23Jul2018), binders contain rev5. 	<u>WTCAR-19-001</u>
NC	<p><i>Water and Wastewater Emergency Response Plan (ERP-ALL-ALL-P-001, rev 1, 27Jan2017)</i> states “Emergency Response Plan procedures and supporting documents, forms and contact list are updated on an as-needed basis”. The procedure header in each of the ERPs indicates “to be reviewed annually (reprinted if necessary). No evidence found of documents being reviewed annually.</p>	<u>WTCAR-19-002</u>
PNC	<p>Checked Sampling, Testing, and Monitoring Activities - DeCew Falls WTP - QMS-WT-DF-T-160 and followed the links to the standards. Quality target link for sodium (technical support document ICPMS Sodium) has a broken link. Various broken links to external and internal documents in the STM table.</p>	<u>2019-001-Audit Internal</u>
BP	<p>Completed emergency & debrief reports are stored as records in ETQ. Some staff interviewed are not aware on how to access these records. Suggest making these documents easier to find.</p>	<u>2019-002-Audit Internal</u>

2019 INTERNAL AUDIT REPORT

Emergency Management – Preventive Maintenance – Sampling, Testing, and Monitoring

Finding	DWQMS Standard Element	Number
BP	It may be beneficial to update chain of custody forms used for sample submission to NREL, and to consider bringing these forms into the document control program.	2019-003-Audit Internal
Element 6: Drinking Water System		
N/A	<i>Not reviewed during this internal audit.</i>	---
Element 7: Risk Assessment		
BP	Staff interviewed recommend that Tech. Trades be invited to participate in risk assessments. Procedure QMS-WT-ALL-P-070rev. 8 does not list representation by the group as mandatory.	2019-004-Audit Internal
Element 8: Risk Assessment Outcomes		
N/A	<i>Not reviewed during this internal audit.</i>	---
Element 9: Organizational Structure, Roles, Responsibilities & Authorities		
C	QMS conforms to the requirements of this element.	---
Element 10: Competencies		
NC	Competencies Table (QMS-WT-ALL-T-100, rev7, 26Jul2018) identifies the Water QMS training course (“This is How We Do It”) as mandatory training. A summary of training records obtained from myLearning showed that not all staff have completed this course in the specified time frame.	WTCAR-19-003
NC	<i>Water and Wastewater Emergency Response Plan (ERP-ALL-ALL-P-001, rev 1, 27Jan2017)</i> specifies that new staff are introduced to the Emergency Response Plan through Water and Wastewater New Employee Orientation and quality management e-learning modules. No evidence found that this is being done.	WTCAR-19-004
NC	Training records for several auditees who have transferred to W-WW from other divisions within Niagara Region indicate that these staff have not completed W-WW Orientation. These staff were not aware of the mandatory training requirement.	WTCAR-19-005

2019 INTERNAL AUDIT REPORT

Emergency Management – Preventive Maintenance – Sampling, Testing, and Monitoring

Finding	DWQMS Standard Element	Number
PNC	The Water & Wastewater Services Division Learning Calendar: Winter-Spring 2019 identifies the “CMMS/EAM for Operations” course as mandatory training, however, this is not reflected in the Competencies Table (QMS-WT-ALL-T-100, rev7, 26Jul2018). As an opportunity for improvement, some staff interviewed recommended that EAM training be provided annually for Operations and be centered around a particular issue or topic each year.	2019-005-Audit Internal
BP	It may be beneficial to develop training and on-boarding plans for Water Operations & Maintenance staff, and to standardize training for lab testing and plant operation. An informal operator training checklist is used in Area 2; however, the checklist has not been formally adopted in all areas.	2019-006-Audit Internal
BP	Staff interviewed recommended that ERP training be included in block safety training.	2019-007-Audit Internal
BP	Top management interviewed recommended that self-service reports be developed and made available via myLearning to summarize conformance with mandatory training.	2019-008-Audit Internal
BP	Consider providing formal sampling training as mandatory training for the samplers/operators. It may also be beneficial to standardize training for lab testing and plant operation. An informal operator training checklist is used in Area 2; however, the checklist has not been formally approved and adopted by all areas.	2019-009-Audit Internal
Element 11: Personnel Coverage		
BP	Managers interviewed recommended that additional resources be provided in order to maintain current maintenance service levels, grow existing maintenance programs, and assist with capital programs and planning.	2019-010-Audit Internal
Element 12: Communications		
BP	There is an opportunity for Top Management to engage and communicate more directly with front-line staff to build relationships and name recognition.	2019-011-Audit Internal
Element 13: Essential Supplies and Services		
N/A	<i>Not reviewed during this internal audit.</i>	---

2019 INTERNAL AUDIT REPORT

Emergency Management – Preventive Maintenance – Sampling, Testing, and Monitoring

Finding	DWQMS Standard Element	Number
Element 14: Review and Provision of Infrastructure		
C	QMS conforms to the requirements of this element.	---
Element 15: Infrastructure Maintenance, Rehabilitation and Renewal		
NC	PM creation is outstanding for assets in the Welland drinking water system following completion of the Phase 1 upgrade.	WTCAR-19-006
BP	It is recommended that the <i>Preventive Maintenance Program Optimization</i> work plan (as proposed to DLT in 2017) be implemented and a champion be assigned to carry it forward.	2019-012-Audit Internal
BP	There is an opportunity for Water Operations to improve record-keeping by assigning PM work orders to Operators and having Operators comment directly on work order findings.	2019-013-Audit Internal
BP	There is an opportunity to better define and divide workload between Water Maintenance staff. In some instances, all PMs are assigned to a System Maintenance Person in the area and not directly assigned to the System Maintenance Assistants.	2019-014-Audit Internal
PNC	There may be an opportunity to confirm and document the process for establishing maintenance programs for new assets. There seems to be confusion surrounding the roles and responsibilities of various groups involved in this process (System Maintenance, Group EAM, Engineering, and consultants/ contractors).	2019-015-Audit Internal
PNC	There may be an opportunity to examine the process for work order closure. Staff can only mark a work order as "entire job complete", regardless of whether or not the PM work was done; they must add notes to the PM to indicate whether the work was actually completed. There is a potential for managers to overlook the incomplete status of a work order if they miss the notes in the comments field.	2019-016-Audit Internal
BP	It may be beneficial to include the PM revision process in a documented and controlled SOP. May consider updating <i>Maintenance (QMS-WT-ALL-P-150, rev5)</i> to include this information.	2019-017-Audit Internal
BP	Staff interviewed recommend that KPIs for maintenance need to be reviewed. Current work order aging report may not be the best measure.	2019-018-Audit Internal

2019 INTERNAL AUDIT REPORT

Emergency Management – Preventive Maintenance – Sampling, Testing, and Monitoring

Finding	DWQMS Standard Element	Number
Element 16: Sampling, Testing and Monitoring		
NC	The auditee in Area 2 water stated that instrument manuals are used as instructions for testing, however, the auditee could not provide the manuals for review.	WTCAR-19-007
PNC	Sampling, Testing, and Monitoring Activities - DeCew Falls WTP - QMS-WT-DF-T-160 was reviewed and limits/targets compared to those on the logsheets and SCADA alarms (hi and hihi alarm limits). Differences were noted between the settled water limits/targets identified in these sources.	2019-019-Audit Internal
PNC	Sampling bottles received not always matching Chain Of Custody provided by Testmark.	2019-020-Audit Internal
Element 17: Measurement & Recording Equipment Calibration & Maintenance		
C	QMS conforms to the requirements of this element.	---
Element 18: Emergency Management		
NC	Reviewed debrief report for watermain break at intersection of Drummond and Gallinger (December 2017). Action items were not assigned in EtQ as per Post-Event Debriefing (ADM-ALL-ALL-P-009, rev2, 11Jul2017).	WTCAR-19-008
NC	Auditors looked at the list of spill kits noted in the Welland WTP monthly PM (PM10496 - RT900385): it notes a total of seven spill kits, including three kits in trucks. The auditees noted that they have not inspected kits in trucks. Auditees responsible for completing spill kit inspection PMs were not aware that spill kits in trucks needed to be inspected. None of the noted trucks are still assigned to Welland WTP. Area 1 Maintenance vehicles have spill kits, and staff interviewed indicated that they do check these; however, no evidence of these inspections was provided.	WTCAR-19-009
PNC	Follow-up items from the Port Colborne WTP break-in were identified in the debrief record and uploaded to EtQ. Auditors reviewed action items and noted that numerous security-related action items remain outstanding after the security incident at Port Colborne WTP two years ago (Apr 2017).	2019-021-Audit Internal

2019 INTERNAL AUDIT REPORT

Emergency Management – Preventive Maintenance – Sampling, Testing, and Monitoring

Finding	DWQMS Standard Element	Number
BP	Staff interviewed recommend that the Associate Directors be responsible for assigning action items related to emergency debriefs.	2019-022-Audit Internal
BP	It may be beneficial to more clearly define responsibilities for keeping printed emergency response manuals up to date, and to standardize the responsibilities across all work areas.	2019-023-Audit Internal
BP	It is recommended that maintenance staff no longer be required to maintain hard copies of the ERP binder. Several maintenance staff stated that they do not use the binder, as they are taking direction from the W-WW Incident Manager on site. Furthermore, the ERPs are high-level and are geared more toward communication, notification, reporting, sampling, supply/service procurement, etc., which are generally responsibilities of the W-WW Incident Manager, not the front-line staff.	2019-024-Audit Internal
BP	It may be beneficial to procure an X2 tablet computer (like those the managers use) for each of the on-call maintenance staff. For maintenance staff who are expected to respond to emergencies, access to NIIMS, EAM, DMD, SOPs, etc. is necessary, and network connectivity is greatly simplified with the X2 tablet in comparison to the iPad.	2019-025-Audit Internal
BP	It may be beneficial for managers to take some sort of threat management training.	2019-026-Audit Internal
Element 19: Internal Audit		
BP	A list of trained internal auditors is maintained in myLearning, but the list does not account for auditor experience and frequency of skill use. It may be beneficial to require trained auditors to audit at least once in a specified time frame (e.g., 5 years) in order for them to be considered “qualified”.	2019-027-Audit Internal
NC	Section 5.6.1 of <i>Internal Auditing (QMS-WT-ALL-P-190, rev7, 26Jul2018)</i> states that internal auditors submit their checklists within 10 working days of completion of the audit. At least one internal auditor submitted checklists on 11Apr, significantly later than the specified 10-day timeline.	WTCAR-19-010

2019 INTERNAL AUDIT REPORT

Emergency Management – Preventive Maintenance – Sampling, Testing, and Monitoring

Finding	DWQMS Standard Element	Number
Element 20: Management Review		
N/A	<i>Not reviewed during this internal audit.</i>	--
Element 21: Continual Improvement		
BP	Staff interviewed recommend that a process for prioritizing opportunities for improvement be developed and implemented.	2019-028-Audit Internal
BP	During internal audits, internal auditors often identify best practices for evaluation. It is recommended that internal audits be included in the SOP as a source of best practices.	2019-029-Audit Internal
NC	<p>Issues were identified with the documented procedure for this element:</p> <ul style="list-style-type: none"> Section 5.1.3 of <i>Corrective Action, Preventive Action, and Best Practices (QMS-WT-ALL-P-210, rev7, 27Jul2018)</i> specifies that approved best practices are to be entered into EtQ's "Corrective Action" module. While most best practices are tracked in "Corrective Action", those stemming from inspections are tracked in the "Compliance Obligations" module. Section 5.3 of <i>Corrective Action, Preventive Action, and Best Practices (QMS-WT-ALL-P-210, rev7, 27Jul2018)</i> refers to "opportunities for improvement". The "Corrective Action" module of the EtQ database uses the terminology "preventive action" and "best practices", not "opportunities for improvement". 	WTCAR-19-011
NC	Section 5.2.3 of <i>Corrective Action, Preventive Action, and Best Practices (QMS-WT-ALL-P-210, rev7, 27Jul2018)</i> indicates that the QMS Rep works with the Lead Auditor and/or Top Management to identify process owners and assign corrective actions. Several internal audit findings from the 2018 internal audit remain at the "Investigation and Root Cause" phase and have not been assigned to process owners.	WTCAR-19-012

Prepared by: Deanna Barrow

Date: May 16, 2019 (revision 0)

Audit Report

Upgrade Audit for:

The Regional Municipality of Niagara
1631650-01

Audited Address: 3501 Schmon Parkway
Thorold ON CAN L2V 4T7

Start Date: Jun 12, 2019 End Date: Jun 14, 2019

Type of audit: Surveillance System Audit

Issue Date: Jun 14, 2019

Revision Level: Final

BACKGROUND INFORMATION

SAI Global conducted an upgrade surveillance system audit of the Regional Municipality of Niagara beginning on Jun 12, 2019 and ending on Jun 14, 2019 to the DRINKING WATER QUALITY MANAGEMENT STSNDARD VERSION 2 - 2017.

The purpose of this audit report is to summarise the degree of conformance with relevant criteria, as defined on the cover page of this report, based on the evidence obtained during the audit of your organization. This audit report considers your organization's policies, objectives, and continual improvement processes. Comments may include how suitable the objectives selected by your organization appear to be in regard to maintaining customer satisfaction levels and providing other benefits with respect to policy and other external and internal needs. We may also comment regarding the measurable progress you have made in reaching these targets for improvement.

SAI Global audits are carried out within the requirements of SAI Global procedures that also reflect the requirements and guidance provided in the international standards relating to audit practice such as ISO/IEC 17021-1, ISO 19011 and other normative criteria. SAI Global Auditors are assigned to audits according to industry, standard or technical competencies appropriate to the organization being audited. Details of such experience and competency are maintained in our records.

In addition to the information contained in this audit report, SAI Global maintains files for each client. These files contain details of organization size and personnel as well as evidence collected during preliminary and subsequent audit activities (Documentation Review and Scope) relevant to the application for initial and continuing certification of your organization.

Please take care to advise us of any change that may affect the application/certification or may assist us to keep your contact information up to date, as required by SAI Global Terms and Conditions.

This report has been prepared by SAI Global Limited (SAI Global) in respect of a Client's application for assessment by SAI Global. The purpose of the report is to comment upon evidence of the Client's conformance with the standards or other criteria specified. The content of this report applies only to matters, which were evident to SAI Global at the time of the audit, based on sampling of evidence provided and within the audit scope. SAI Global does not warrant or otherwise comment upon the suitability of the contents of the report or the certificate for any particular purpose or use. SAI Global accepts no liability whatsoever for consequences to, or actions taken by, third parties as a result of or in reliance upon information contained in this report or certificate.

Audit Report

Please note that this report is subject to independent review and approval. Should changes to the outcomes of this report be necessary as a result of the review, a revised report will be issued and will supersede this report.

Standard:	DRINKING WATER QUALITY MANAGEMENT STANDARD VERSION 2 - 2017
Scope of Certification:	Drinking Water
Drinking Water System Owner:	Regional Municipality of Niagara
Operating Authority:	Regional Municipality of Niagara
Population Serviced:	400000
Activities:	Treatment and Distribution
Drinking Water Systems:	Decew Falls / Niagara Falls Drinking Water System Municipal Drinking Water Licence # 007-102, Issue 5 Grimsby Drinking Water System Municipal Drinking Water Licence # 007-105, Issue 3 Port Colborne Drinking Water System Municipal Drinking Water Licence # 007-101, Issue 3 Welland Drinking Water System Municipal Drinking Water Licence # 007-104, Issue 3 Rosehill Drinking Water System Municipal Drinking Water Licence # 007-103, Issue 5
Total Audit Duration:	Days: 2.25 audit days
Audit Team Member:	Team Leader Patrick Moore
Other Participants:	None

Definitions and action required with respect to audit findings

Major Non-conformance

Based on objective evidence, the absence of, or a significant failure to implement and/or maintain conformance to requirements of the applicable standard. Such issues may raise significant doubt as to the capability of the management system to achieve its intended outputs (i.e. the absence of or failure to implement a complete Management System clause of the standard); or

A situation which would, on the basis of available objective evidence, raise significant doubt as to the capability of the Management System to achieve the stated policy and objectives of the customer.

NOTE: The “applicable Standard” is the Standard which SAI Global is issuing certification against, and may be a Product Standard, a management system Standard, a food safety Standard or another set of documented criteria.

Action required: This category of findings requires SAI Global to issue a formal NCR; to receive and approve client’s proposed correction and corrective action plans; and formally verify the effective implementation of planned activities. Correction and corrective action plans should be submitted to SAI Global prior to commencement of follow-up activities as required. Follow-up action by SAI Global must ‘close out’ the NCR or reduce it to a lesser category within 90 days for initial certification and within 60 days for surveillance or re-certification audits, from the last day of the audit.

If significant risk issues (e.g. safety, environmental, food safety, product legality/quality, etc.) are detected during an audit, these shall be reported immediately to the Client and more immediate or instant correction shall be requested. If this is not agreed and cannot be resolved to the satisfaction of SAI Global, immediate suspension shall be recommended.

In the case of initial certification, failure to close out NCR within the time limits means that the Certification Audit may be repeated.

In the case of an already certified client, failure to close out NCR within the time limits means that suspension proceedings may be instituted by SAI Global.

Follow-up activities incur additional charges.

Minor Non-conformance

This represents either a management system weakness or minor issue that could lead to a major nonconformance if not addressed. Each minor NC should be considered for potential improvement and to further investigate any system weaknesses for possible inclusion in the corrective action program

Action required: This category of findings requires SAI Global to issue a formal NCR; to receive and approve client’s proposed correction and corrective action plans; and formally verify the effective implementation of planned activities at the next scheduled audit.

Opportunity for Improvement

A documented statement which may identify areas for improvement, however shall not make specific recommendation(s).

Action required: Client may develop and implement solutions in order to add value to operations and management systems. SAI Global is not required to follow-up on this category of audit finding.

Audit Type and Purpose

Surveillance Audit

A systems desktop audit in accordance with the systems audit procedure as it applies to Full Scope accreditation. The audit also included consideration of the results of the most recent audit undertaken in accordance with this Accreditation Protocol and any of the following that have occurred subsequent to that audit including but limited to:

- (a) the results of any audits undertaken in accordance with element 19 of the DWQMS V2;
- (b) historical responses taken to address corrective action requests made by an Accreditation Body;
- (c) the results of any management reviews undertaken in accordance with element 20 of the DWQMS V2; and,
- (d) any changes to the documentation and implementation of the QMS.

Audit Objectives

The objective of the audit was to determine whether the Operational Plan and associated documents of the drinking water Quality Management System (QMS) of the subject system conform to the requirements of the Ontario Ministry of the Environment, Conservation and Parks' (MECP) Drinking Water Quality Management Standard (DWQMS V2).

The audit was also intended to gather the information necessary for SAI Global to assess whether accreditation can continue to be offered to the Operating Authority.

Audit Scope

The Operational Plan and associated documents and records of the Drinking Water Quality Management System of the subject system were reviewed.

Audit Criteria

- The Drinking Water Quality Management Standard Version 2
- Current QMS manuals, procedures and records implemented by the Operating Authority
- SAI Global Accreditation Program Handbook

Confidentiality and Documentation Requirements

SAI Global stores their records and reports to ensure their preservation and confidentiality. Unless required by law, SAI Global will not disclose audit records to a third party without prior written consent of the applicant. The only exception will be that the SAI Global will provide audit and corrective action reports to the Ontario Ministry of the Environment, Conservation and Parks (MECP). For more information, please refer to the SAI Global Accreditation Program Handbook.

As part of the SAI Global Terms, it is necessary for you to notify SAI Global of any changes to your Quality Management System that you believe are significant enough to risk non-conformity with DWQMS V2: For more information, please refer to the SAI Global Accreditation Program Handbook.

Review of any changes to the Operating Authority

No changes to the organizational structure of the water QMS Operating Authority have been identified since the last audit.

EXECUTIVE OVERVIEW

Based on the results of this surveillance system audit, the management system remains effectively implemented and meets the requirements of the standard relative to the scope of certification; therefore, a recommendation for continued certification will be submitted.

Recommendation

Based on the results of this audit, it has been determined that the management system is effectively implemented and maintained and meets the requirements of the standard relative to the scope of certification identified in this report; therefore, a recommendation for continued certification will be submitted to SAI Global review team.

Opportunities for Improvement

No opportunities for improvement were identified during this audit.

It is suggested that any opportunities for improvement be considered by management to further enhance the Operating Authority's Quality Management System and performance.

Management System Documentation

The management system's Operational Plan was reviewed and found to be in conformance with the requirements of the standard.

Management Review

Records of the most recent management review meetings were verified and found to meet the requirements of the standard. All inputs were reflected in the records, and appear suitably managed as reflected by resulting actions and decisions.

Internal Audits

Internal audits are being conducted at planned intervals to ensure conformance to planned arrangements, the requirements of the standard and the established management system.

Corrective, Preventive Action & Continual Improvement Processes

The Operating Authority is implementing an effective process for the continual improvement of the management system through the use of the quality policy, quality objectives, audit results, data analysis, the appropriate management of corrective and preventive actions and management review.

Summary of Findings

1. Quality Management System	Conforms
2. Quality Management System Policy	Conforms
3. Commitment and Endorsement	Conforms
4. Quality Management System Representative	Conforms
5. Document and Records Control	Conforms
6. Drinking-Water System	Conforms
7. Risk Assessment	Conforms
8. Risk Assessment Outcomes	Conforms
9. Organizational Structure, Roles, Responsibilities and Authorities	Conforms
10. Competencies	Conforms
11. Personnel Coverage	Conforms
12. Communications	Conforms
13. Essential Supplies and Services	Conforms
14. Review and Provision of Infrastructure	Conforms
15. Infrastructure Maintenance, Rehabilitation & Renewal	Conforms
16. Sampling, Testing and Monitoring	Conforms
17. Measurement & Recording Equipment Calibration and Maintenance	Conforms
18. Emergency Management	Conforms
19. Internal Audits	Conforms
20. Management Review	Conforms
21. Continual Improvement	Conforms
Major NCR #	Major non-conformity. The auditor has determined one of the following: (a) a required element of the DWQMS has not been incorporated into a QMS; (b) a systemic problem with a QMS is evidenced by two or more minor non-conformities; or (c) a minor non-conformity identified with a corrective action request has not been remedied.
Minor NCR #	Minor non-conformity. In the opinion of the auditor, part of a required element of the DWQMS has not been incorporated satisfactorily into a QMS.
OFI	Opportunity for improvement. Conforms to requirement, but there is an opportunity for improvement.
Conforms	Conforms to requirement.
NA/NC	Not applicable/Not Covered during this audit.
****	Additional comment added by auditor in the body of the report.

PART D. Audit Observations, Findings and Comments

DWQMS Reference:	1 Quality Management System
Client Reference:	QMS-WT-ALL-MAN-010 Water QMS Operational Plan, Rev No. 9, Effective Date Mar 28, 2019
<p>Details: <i>(personnel interviewed, procedures, activities and records observed)</i></p> <p>The Operational Plan and associated documentation meet the requirements of the DWQMS Version 2 - 2017.</p>	

DWQMS Reference:	2 Quality Management System Policy
Client Reference:	QMS-WT-ALL-MAN-010 Water QMS Operational Plan, Rev No. 9, Effective Date Mar 28, 2019, Section 2
<p>Details: <i>(personnel interviewed, procedures, activities and records observed)</i></p> <p>The QMS Policy, issued Mar 31, 2015, Rev 1, meets the requirements of the DWQMS Version 2-2017.</p>	

DWQMS Reference:	3 Commitment and Endorsement
Client Reference:	QMS-WT-ALL-MAN-010 Water QMS Operational Plan, Rev No. 9, Effective Date Mar 28, 2019, Section 3
<p>Details: <i>(personnel interviewed, procedures, activities and records observed)</i></p> <p>Commitment and endorsement of the current Operational plan by the Owner (Regional Council) is shown through approval of the minutes of the Public Works Committee management systems update meeting held on Mar 19, 2019 (Report PW 19-2019). The Council authorized the Regional Chair and the Regional Clerk to sign the Operational Plan as evidence of Council's endorsement, which they did on May 8, 2019. On May 24 and May 25, 2018, the five members of Top Management renewed their commitment and endorsement of the Operational Plan. Part of Top Management's responsibilities is to maintain commitment and endorsement of future versions of the Operational Plan as approved by the Owner or delegate.</p>	

DWQMS Reference:	4 Quality Management System Representative
Client Reference:	QMS-WT-ALL-MAN-010 Water QMS Operational Plan, Rev No. 9, Effective Date Mar 28, 2019, Section 4
<p>Details: <i>(personnel interviewed, procedures, activities and records observed)</i></p> <p>Top Management has appointed the Water & Wastewater Quality Management Specialist as the QMS Representative for Niagara Region's drinking water systems. In the event that the Water & Wastewater Quality Management Specialist is unable to fulfill the duties of QMS Representative, the Water Compliance Specialist will assume the role and responsibilities. Responsibilities of the QMS Representative are outlined in the Operational Plan.</p>	

Audit Report

DWQMS Reference:	5 Document and Record Control
Client Reference:	QMS-WT-ALL-MAN-010 Water QMS Operational Plan Rev No. 9, Effective Date Mar 28, 2019, Section 5 QMS-WT-ALL-P-050 Document and Records Control Rev. No. 7, Feb 8, 2017
Details: <i>(personnel interviewed, procedures, activities and records observed)</i> <p>The Document and Control Procedure meets the requirements of DWQMS V2. The procedure delineates between other-controlled documents identified in Table 1 (e.g. regulations governing sampling, testing and monitoring requirements available on the MECP website) and internally-controlled documents such as the Operational Plan and associated documents, and documents required for effective operation of the QMS. Table 2 in the procedure identifies records which are relevant to the QMS, such as training attendance records, purchasing records and SCADA data. Both tables usefully also identify the elements of the standard related to documents and records listed in the tables.</p>	

DWQMS Reference:	6 Drinking Water System
Client Reference:	QMS-WT-ALL-MAN-010 Water QMS Operational Plan, Rev No. 9, Effective Date Mar 28, 2019, Section 6 QMS-WT-XX-P-060 Individual Drinking Water System <u>Descriptions</u> , various revision levels, where XX represents one of the five drinking water systems, e.g. QMS-WT-PC-P-060, Rev. No. 4, Nov 9/16 for Port Colborne. QMS-WT-XX-V-060 Individual Drinking-Water System Process <u>Schematics</u> , various revision levels, where XX represents one of the five drinking water systems, e.g. QMS-WT-GR-V-060, Rev. No. 3, Sep 12/16 for Grimsby.
Details: <i>(personnel interviewed, procedures, activities and records observed)</i> <p>No documentation changes were required in order to meet the requirements of DWQMS V2-2017. The drinking water descriptions and process schematics for the five drinking water systems are well documented. Table I: Niagara Region's Drinking Water Systems in the procedure identifies the components of the individual drinking water systems and references the locally-owned and operated municipal distribution systems supplied from each DW system. Fluctuations, challenges and threats common to all five drinking water systems include seasonal temperature fluctuations with three resulting operational threats, e.g. zebra mussels clogging the raw water intake, and event-driven fluctuations such as high winds and storms causing increased turbidity in the raw water.</p> <p>All of the source water treated by the Niagara Region is surface water. The Decew Falls and Niagara Falls water treatment plants are connected in Niagara-on-the-Lake and are defined as one drinking water system. The Decew Falls/Niagara Falls water treatment system and the Welland water treatment plant have the additional event-driven challenges of responding to changes in flow direction. The Niagara Falls current process is not able to adequately treat water from the Welland River. The Action/Control Measures involve shutting down the intake and investigating the issue to determine a course of action. For the Welland plant, Action/Control Measures involve using the main bypass gate for isolation when the Welland River level exceeds the Welland Canal level.</p>	

DWQMS Reference	7 Risk Assessment
Client Reference:	QMS-WT-ALL-MAN-010 Water QMS Operational Plan, Rev No. 9, Effective Date Mar 28, 2019, Section 7 QMS-WT-ALL-P-070 Drinking-Water System Risk Assessment, Rev. No. 8, May 16, 2018 QMS-WT-ALL-F-070 Risk Assessment Review Form (Water), Rev 0, Aug 29, 2016
<p>Details: <i>(personnel interviewed, procedures, activities and records observed)</i></p> <p>Risk assessment teams have been established for each drinking water system with the QMS Rep attending each meeting. A risk assessment is carried out at least every 36 months (most recent Feb 7, 2018) for each system (treatment, storage, and general transmission) and an annual review of the risk assessment results is done. The annual risk assessment reviews were carried out on Feb 15-21, 2019 for the six water treatment plants. Details of the reviews are captured in the respective Risk Assessment Review Forms. Potential hazardous events specified by the MECP were considered. Action plans to decrease the severity and/or likelihood of the associated hazardous events are developed for high scoring risks (risk score greater than 15) or other risks identified to require action.</p>	

DWQMS Reference:	8 Risk Assessment Outcomes
Client Reference:	QMS-WT-ALL-MAN-010 Water QMS Operational Plan, Rev No. 9, Effective Date Mar 28, 2019, Section 8 Risk Assessment Outcomes Table QMS-WT-ALL-T-080, Rev. No. 4, Feb 7, 2018 OP-WT-ALL-P-028 Tracking CCL Deviations, Rev. No. 1, Feb 8, 2017 OP-WT-ALL-P-0XX-CCP response procedures, various revision levels, where 0XX represents one of the critical control point response procedures, e.g. OP-WT-ALL-P-008-CCP-Filter Effluent Turbidity, Rev. No. 7, Feb 8, 2017
<p>Details: <i>(personnel interviewed, procedures, activities and records observed)</i></p> <p>The Risk Assessment Outcomes Table for the WTPs and their respective transmission systems was updated Feb 28, 2019, following the risk assessment reviews completed earlier in the month. Potential hazardous events specified by the MECP were included as applicable. Included in the table are the five critical control points [coagulant (aluminum sulphate) feed, secondary disinfection (distribution chlorine), filter effluent turbidity, primary disinfectant (sodium hypochlorite) feed and verification of primary disinfection], the respective critical control limits, monitoring procedures/processes and appropriate responses/mitigating procedures for the CCPs.</p> <p>Risk scores were updated to reflect revised likelihoods and severities associated with potential hazardous events, and the comments and supporting information sections were expanded as appropriate, e.g. risk values (likelihood times severity) for the coagulation CCPs at both the Niagara Falls and Rosehill plants (Risk ID #5-7) were increased due to the increased severity of problems resulting from potential equipment failure. Risk ID 14-9 for the Rosehill WTP has a higher risk value due to possible clogging of the process waste outfall with beach debris as a result of higher water levels in Lake Ontario. The risk table for transmission was modified to show that new equipment was installed at the Welland plant (ID # WE-87 and #WE-94; no change in risk value).</p>	

DWQMS Reference:	9 Organizational Structure, Roles, Responsibility and Authorities
Client Reference:	QMS-WT-ALL-MAN-010 Water QMS Operational Plan, Rev No. 9, Effective Date Mar 28, 2019, Section 9
<p>Details: <i>(personnel interviewed, procedures, activities and records observed)</i></p> <p>Figure 2 Water and Wastewater Services Division - Organizational Structure in the Operational Plan depicts the four branches of the Division and clearly identifies Top Management, the QMS Rep, which staff are directly responsible for the safe and reliable supply of drinking water and which staff provide supporting activities. Table 3 Water and Wastewater Services Division - Responsibilities and Authorities, also included in the Operational Plan, correlates well with the organizational chart. Responsibilities and authorities for positions identified in the organizational structure are well defined.</p>	

DWQMS Reference:	10 Competencies
Client Reference:	QMS-WT-ALL-MAN-010 Water QMS Operational Plan, Rev No. 9, Effective Date Mar 28, 2019, Section 10 QMS-WT-ALL-P-100 Competencies, Rev. No.6, Sep 19, 2016 QMS-WT-ALL-T-100 Competencies Table, Rev. No.7, Jul 26, 2018
<p>Details: <i>(personnel interviewed, procedures, activities and records observed)</i></p> <p>Competency requirements of operations personnel performing duties directly affecting drinking water quality have been detailed in the Competencies Table. Frequency of training is included in the table. In the recent review, training requirements for all positions were reviewed and minor adjustments were made. The procedure specifies that all Operating Authority personnel are informed of the relevance of their job to the provision of safe drinking water through presentations, written communications and computer-based training.</p>	

DWQMS Reference:	11 Personnel Coverage
Client Reference:	QMS-WT-ALL-MAN-010 Water QMS Operational Plan, Rev No. 9, Effective Date Mar 28, 2019, Section 11 QMS-WT-ALL-P-110 Personnel Coverage, Rev. No. 8, Aug 1, 2018
<p>Details: <i>(personnel interviewed, procedures, activities and records observed)</i></p> <p>The personnel coverage procedure ensures that operations personnel meeting the required competencies are available for duties that directly affect drinking water quality. Personnel coverage is ensured under various conditions such as normal operation, after-hours operation, absences, emergency situations and strikes/lockouts. Designations of the ORO and OIC are defined. Responsibility for ensuring that sufficient personnel are available for drinking water systems operations is shared by various management and supervisory levels within the Operating Authority. Workforce planning has been implemented as part of the annual management review to deal with potential staffing reductions and unavailability of certified staff as a result of staff retirements, turnover, illness, etc.</p>	

DWQMS Reference:	12 Communications
Client Reference:	QMS-WT-ALL-MAN-010 Water QMS Operational Plan, Rev No. 9, Effective Date Mar 28, 2019, Section 12 QMS-WT-ALL-P-120 Communications, Rev. No. 5, Sep 19, 2016
<p>Details: <i>(personnel interviewed, procedures, activities and records observed)</i></p> <p>The procedure for communications covers how relevant aspects of the QMS are communicated between Top Management and the Owner, Operating Authority personnel, essential suppliers, area municipalities, the general public and external agencies. The procedure also includes how external agencies (e.g. MECP, MOH, SAC) communicate with Top Management.</p>	

DWQMS Reference:	13 Essential Supplies and Services
Client Reference:	QMS-WT-ALL-MAN-010 Water QMS Operational Plan, Rev No. 9, Effective Date Mar 28, 2019, Section 13 QMS-WT-ALL-P-130 Essential Supplies and Services, Rev. No. 8, Apr 24, 2017 Essential Supplies and Services pages in VINE
<p>Details: <i>(personnel interviewed, procedures, activities and records observed)</i></p> <p>Four main categories of essential supplies and services have been identified - chemical supplies, lab services, calibration services and miscellaneous supplies and services. The list of essential supplies and services is now maintained on the Essential Supplies and Services page in VINE.</p> <p>Procurement of essential supplies and services is ensured through a contract for tendered essential supplies and services and by flexibility afforded to the appropriate Manager to contact alternate suppliers, if needed, for non-tendered essential supplies and services.</p> <p>Quality of essential supplies and services is ensured through clearly identifying quality requirements in contract specifications for tendered essential supplies and services. For non-tendered essential supplies and services, the Area Operations or Maintenance Managers have the responsibility to take action if the quality requirements are not met. Additionally, an Approved Product and Equipment List for the Niagara Region's drinking water systems is maintained to ensure that the quality of these products and equipment meets requirements.</p>	

DWQMS Reference:	14 Review and Provision of Infrastructure
Client Reference:	QMS-WT-ALL-MAN-010 Water QMS Operational Plan, Rev No. 9, Effective Date Mar 28, 2019, Section 14 QMS-WT-ALL-P-140 Review, Rehabilitation and Renewal of Infrastructure, Rev. No. 9, Jul 26, 2018
<p>Details: <i>(personnel interviewed, procedures, activities and records observed)</i></p> <p>The procedure calls for a review of the drinking water system's infrastructure to be held annually to assess the adequacy of the infrastructure required to operate and maintain the system. The procedure has been updated to include consideration of the outcomes of the risk assessment process as part of the Capital Validation Process by which capially-funded drinking water infrastructure major maintenance, rehabilitation and renewal projects are initiated and approved. The ultimate output of this process is the Final Draft 10-Year Capital Budget which is presented to the Owner (Regional Council) for approval, e.g. the Capital Forecast Summary - Water (2018). Personnel from Operations & Maintenance, Engineering and Integrated Systems participate in the Capital Validation Process.</p>	

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DWQMS Reference:	15 Infrastructure Maintenance, Rehabilitation and Renewal
Client Reference:	QMS-WT-ALL-MAN-010 Water QMS Operational Plan, Rev No. 9, Effective Date Mar 28, 2019, Section 15 QMS-WT-ALL-P-150 Maintenance, Rev. No. 5, Jul 30, 2018
<p>Details: <i>(personnel interviewed, procedures, activities and records observed)</i></p> <p>The Operating Authority uses the Enterprise Asset Management (EAM) system to record and track planned maintenance (non-emergency and preventive) and unplanned maintenance (ad-hocs, breakdowns and emergency), and renewal and rehabilitation of infrastructure that is funded from the operating budget. Key Performance Indicators (KPI's) are available to each of the Maintenance Managers in the EAM system to track the effectiveness of the maintenance program.</p> <p>Long-term infrastructure rehabilitation and renewal plans for the DWS are identified as part of the Capital Validation Process during the review and provision of infrastructure, e.g. the Decew Falls WTP - Valve House - complete rehabilitation and restoration of the original building built in 1919, with forecast expenditures of \$90K in Y1 (2019) and \$420K in Y3 (2021). Other sources for identifying long-term infrastructure needs include observations by staff and using information in EAM to generate long-term maintenance forecasts.</p>	

DWQMS Reference:	16 Sampling, Testing and Monitoring
Client Reference:	QMS-WT-ALL-MAN-010 Water QMS Operational Plan, Rev No. 9, Effective Date Mar 28, 2019, Section 16 QMS-WT-ALL-P-160 Sampling, Testing and Monitoring, Rev. No. 4, Sep 28, 2016 QMS-WT-XX-T-160 Sampling, Testing and Monitoring Activities, various revision levels, where XX represents one of the six water treatment plants, e.g. QMS-WT-DF-T-160, Rev. No. 4, Feb 28, 2017 for the Decew Falls WTP (note: these procedures currently are being revised) OP-WT-ALL-P-018 Initial Response to an Adverse Water Quality Result, Rev 5, Feb 17, 2017
<p>Details: <i>(personnel interviewed, procedures, activities and records observed)</i></p> <p>The procedure includes details of steps to be taken by the Operator if a drinking water system fails to meet a quality target which either results in or does not result in an adverse test result.</p> <p>A table for sampling, testing and monitoring has been developed for each water treatment plant (Table 1 Process Sampling in QMS-WT-XX-T-160 Sampling, Testing and Monitoring Activities) to reflect the uniqueness of conditions under which each of the treatment plants operates, including frequency, quality target responses if targets are not met and challenging conditions. Tables for process sampling identify the points in the drinking water treatment systems where sampling is done for each WTP, e.g. raw water, settled water, filters, remote stations, etc.</p> <p>Also included for each plant in Table 2 Testing Conducted Externally at MECP Licensed Laboratories is identification of parameters which are tested externally at MECP licensed labs according to schedules identified in the relevant O. Regs. Responses to adverse test results are provided, e.g. what immediate action to take to address the issue and what steps to take if an adverse is confirmed.</p>	

DWQMS Reference:	17 Measurement and Recording Equipment Calibration and Maintenance
Client Reference:	QMS-WT-ALL-MAN-010 Water QMS Operational Plan, Rev No. 9, Effective Date Mar 28, 2019, Section 17 QMS-WT-ALL-P-170 Measurement and Recording Equipment Calibration and Maintenance, Rev. No. 5, Feb 28, 2017
<p>Details: <i>(personnel interviewed, procedures, activities and records observed)</i></p> <p>Measurement equipment is classified according to a combination of its maintenance classification (reference, confirmation or calibration status) and its functional classification (information, control or regulatory). Equipment used for process control and regulatory monitoring has a higher priority for maintenance and calibration compared to equipment deemed to be of medium priority or used only for informational or reference purposes, e.g. a classification of CaR indicates that the equipment is classified as high priority and is calibrated according to a regulatory schedule whereas a classification of Col indicates that the equipment is maintained as needed.</p> <p>Chart recorders installed at selected WTPs are not calibrated, confirmed, or maintained in any way since the data collected by these devices is not used to calculate operating parameters or to make operational decisions.</p> <p>All required calibrations, confirmations, and maintenance activities are scheduled in EAM based on their assigned classifications. EAM generates resulting work orders and associated due dates.</p>	

DWQMS Reference:	18 Emergency Management
Client Reference:	QMS-WT-ALL-MAN-010 Water QMS Operational Plan, Rev No. 9, Effective Date Mar 28, 2019, Section 18 ERP-ALL-ALL-P-001 Water and Wastewater Emergency Response Plan (ERP)-Front End, Rev. No. 1, Jan 27, 2017 ERP-ALL-ALL-T-002 Water and Wastewater Emergency Response Contact List, printed version updated to Mar 29, 2019 (most current version is available electronically on VINE)
<p>Details: <i>(personnel interviewed, procedures, activities and records observed)</i></p> <p>Ten emergency response procedures for the water systems have been referenced in Water and Wastewater Emergency Response Plan (ERP)-Front End, e.g. ERP-ALL-ALL-P-003 SCADA System-Wide Interruption, Rev. No. 1, Dec 15, 2016. The Emergency Response Contact List is extensive and includes contact information for the Niagara Region Water and Wastewater Services Division (e.g. Water Operations & Maintenance for all three Areas, Technical Trades and Engineering), Service Providers, Emergency Lab Services, Area Municipalities and other key contacts.</p> <p>A mock emergency exercise was held on Mar 22, 2018. Over eighty participants from Water and Wastewater Services, area municipal representatives and other branches of the Region worked through five emergency modules including a communications breakdown with a telecommunications provider, wet weather impacts, loss of water from an elevated storage tank, a watermain break and critical injuries at the scene of a watermain break. Detailed summary notes were developed for each emergency module which included Summaries of Common Themes and Discussion Topics, Example Policies and Procedures and Summary of Action Items and Topics to Explore. Feedback from participants was very positive.</p>	

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DWQMS Reference:	19 Internal Audits
Client Reference:	QMS-WT-ALL-MAN-010 Water QMS Operational Plan, Rev No. 9, Effective Date Mar 28, 2019, Section 19 QMS-WT-ALL-P-190 Internal Audit Procedure, Rev. No. 8, Apr 25, 2019 QMS-WT-ALL-P-210 Corrective Action, Preventive Action and Best Practices, Rev. No. 8, May 21, 2019
Details: <i>(personnel interviewed, procedures, activities and records observed)</i> <p>Internal audits are scheduled so that all 21 elements of the DWQMS are audited at least once every three calendar years and that each drinking water system facility is audited in a two-year cycle. Audits for 2019 were completed between March 11 and 15 at all six WTPs by a team of experienced auditors. Eighteen of the DWQMS elements were audited, with, Element 8 (Risk Assessment Outcomes), Element 13 (Essential Supplies and Services) and Element 20 (Management Review) planned to be audited in future audits as there were no changes to these elements in going to Version 2 of the standard.</p> <p>The internal audit report of May 16, 2019 records that 12 nonconformances (NCs), seven potential non-conformances (PNCs) and 22 best practices for evaluation (BPs) were identified during the audit with Element 10 (Competencies) showing the greatest potential for improvement, followed by Element 15 (Infrastructure, Maintenance, Rehabilitation and Renewal) and Element 18 (Emergency management). The NCs, PNCs and BPs have been entered into the respective Corrective Action log and the Preventive Action/Best Practices log.</p>	

DWQMS Reference:	20 Management Review
Client Reference:	QMS-WT-ALL-MAN-010 Water QMS Operational Plan, Rev No. 9, Effective Date Mar 28, 2019, Section 20 QMS-WT-ALL-P-200 Management Review Procedure, Rev. No. 7, Jul 26, 2018
Details: <i>(personnel interviewed, procedures, activities and records observed)</i> <p>Two management reviews of the QMS are held each year to assess the continuing suitability, adequacy and effectiveness of the QMS. The management reviews for 2018 were carried out on Jun 4, 2018 (Part I) and Dec 10, 2018 (Part II). For the 2019 management review, Part I was held on May 31, 2019 with Part II scheduled for Nov 21, 2019. All required agenda items are covered over the two meetings. Review of best management practices, e.g. those identified during MECF inspections and during internal audits, has been added as an agenda item. The QMS Representative provides Top Management with a summary of best practices that have been implemented over the previous 12 months and any that warrant Top Management's review and approval prior to implementation. Action items were identified as needed to address issues identified during the review.</p> <p>Not all five members of Top Management attended all of the meetings as is required by the Management Review Procedure. The QMS Representative will initiate a non-conformance to address this issue.</p>	

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DWQMS Reference:	21 Continual Improvement
Client Reference:	QMS-WT-ALL-MAN-010 Water QMS Operational Plan, Rev No. 9, Effective Date Mar 28, 2019, Section 21 QMS-WT-ALL-P-210 Corrective Action, Preventive Action and Best Practices, Rev. No. 8, May 21, 2019
<p>Details: <i>(personnel interviewed, procedures, activities and records observed)</i></p> <p>The Operational Plan indicates that the Niagara Region maintains and continually improves the QMS through annual audits, management reviews, implementation of best management practices, process optimization and staff development. Implementation of corrective actions, preventive actions and best management practices is a key driver of continual improvement of the QMS. Various sources of corrective actions, preventive actions and best management practices are identified in the procedure Corrective Action, Preventive Action and Best Management Practices, such as internal and external audits, staff suggestions, customer feedback, ER drills and MECP's published list of BMPs. Implemented best practices are tracked as preventive actions or opportunities for improvement. The QMS Representative has the responsibility to verify effectiveness of corrective actions and preventive actions prior to closure. Best practices do not require formal verification of effectiveness.</p> <p>Three logs have been developed to record continual improvement initiatives: a Corrective Action log used to record progress and effectiveness of responses to non-conformances identified during internal audits; a Preventive Action and Best Practices log used to record progress and actions taken for potential non-conformances and best practices; and a Best Practices (MECP Inspections) log to track follow up actions taken in response to Inspectors' recommendations/requested actions.</p>	

Details regarding the personnel interviewed and objective evidence reviewed are maintained on file at SAI Global.

This report was prepared by:

Patrick Moore

SAI Global Management Systems Auditor

The audit report is distributed as follows:

- SAI Global
- Operating Authority
- Owner
- MECP

Notes

Copies of this report distributed outside the organization must include all pages.

WASTEWATER QUALITY MANAGEMENT SYSTEM: INTERNAL AUDIT REPORT

OCTOBER 21 – 31, 2019

AREA 1:

**NIAGARA FALLS WWTP
ANGER AVENUE WWTP**

AREA 2:

**WELLAND WWTP
SEAWAY WWTP**

AREA 3:

**PORT WELLER WWTP
PORT DALHOUSIE WWTP
BAKER ROAD WWTP**

ENVIRONMENTAL CENTRE

INTEGRATED SYSTEMS

REPORT PREPARED NOVEMBER 7, 2019

1.0 INTRODUCTION

1.1 Purpose

The purposes of this internal audit were:

- To verify that the Wastewater QMS conforms to the requirements of the DWQMS¹ and the requirements of the Wastewater QMS Operational Plan; and
- To confirm that the QMS has been effectively implemented and properly maintained for all wastewater systems.

Audits were completed between October 21 and October 31, 2019. Internal audits were conducted with Operations and Maintenance management and staff in each of the three wastewater service areas, with the QMS Representative, and with staff of Integrated Systems, members of Top Management, and other support staff.

1.2 Scope

For the 2019 internal audit, the [Bypass, Overflow, and Spill Notification and Reporting](#) process (**OP-WW-ALL-P-038, rev2, 1Mar2018**) was selected for auditing; this process covers a multitude of QMS elements. Additional elements and auditees that are not covered within the scope of this process were audited separately on an element-by-element basis, with audit teams focusing on specific elements in each area. Table 1 provides details of the audit scope.

Table 1: Audit Scope per Area/Group

Process	Potential Elements	Area 1	Area 2	Area 3	General
Bypass, Overflow, and Spill Notification and Reporting (OP-WW-ALL-P-038)	2 – QMS Policy				
	4 – QMS Representative				
	5 – Document and Records Control				
	6 – Wastewater System				
	9 – Org Structure, Roles, Responsibilities and Authorities	✓	✓	✓	✓
	10 – Competencies				
	11 – Personnel Coverage				
	12 – Communications				

¹ As modified by Niagara Region to suit our wastewater services.

Process	Potential Elements	Area 1	Area 2	Area 3	General
	13 – Essential Supplies/Services 14 – Review and Provision of Infrastructure 15 – Infrastructure Maintenance, Rehabilitation and Renewal 16 – Sampling, Testing, and Monitoring 17 – Measurement and Recording Equipment Calibration and Maintenance 18 – Emergency Management 20 – Management Review 21 – Continual Improvement				
N/A	3 – Commitment and Endorsement				✓
N/A	7 – Risk Assessment	✓	✓	✓	✓
N/A	8 – Risk Assessment Outcomes	<i>Not applicable for Wastewater</i>			
N/A	19 – Internal Audits				✓

1.3 Selection of Internal Audit Team and Schedule

All internal auditors have completed Internal Auditor Training as required by ***Internal Auditing (QMS-WW-ALL-P-190, rev1, effective 30Sep2019)***.

The audit schedule and auditor assignments are identified in Table 2.

Table 2: Audit Assignments – Auditors and Locations

Area	Auditors	Date/Time	Facility/Subject
Area 1	Michelle Max	Monday, 28 Oct (am)	Niagara Falls WWTP
	Keith Lepine	Monday, 28 Oct (pm)	Anger Avenue WWTP
	Jocelyn Williams		
Area 2	Rachel Whyte	Monday, 21 Oct (am)	Welland WWTP
	Jennifer McDowell	Monday, 21 Oct (pm)	Seaway WWTP
	Jesse Howarth		
Area 3	Dawn MacArthur	Monday, 28 Oct (pm)	Port Weller WWTP
		Thursday, 31 Oct (am)	Port Dalhousie WWTP
		Thursday, 31 Oct (pm)	Baker Road WWTP
Integrated Systems	Jen Croswell	Tuesday, 17 Oct (pm)	Calibration
	Josh MacArthur	Thursday, 19 Oct (pm)	CMMS
General	Jen Croswell Josh MacArthur	Friday, 25 Oct (am)	Asset Management
		Friday, 25 Oct (pm)	WW Compliance Tech.
		Monday, 28 Oct, Wednesday, 30 Oct, Thursday, 31 Oct	Top Management
		Tuesday, 29 Oct (am)	QMS Reps
		Tuesday, 29 Oct (pm)	Asset Performance Spvr
		Monday, 28 Oct (am), Wednesday, 30 Oct (am)	Maintenance Support
		Wednesday, 30 Oct (pm)	Calibration

1.4 Criteria and Methodology

Audit criteria included the following:

- **Internal Auditing (QMS-WW-ALL-P-190, rev1, effective 30Sep2019;**
- **Niagara Region Wastewater Operational Plan (rev2, effective 28Mar2019)**
and supporting procedures; and
- Internal audit training materials (various auditor training courses).

Wastewater systems were audited by assigned auditors as noted in Section 1.3 of this Audit Report. Top Management, the QMS Representative, and other support staff were

also interviewed by assigned auditors. Auditor checklists were completed and reviewed with the Lead Auditor; the checklists are not attached, but are filed as per the ***Document & Records Control Procedure (QMS-WW-ALL-P-050, rev1, effective 30Sep2019)***. Individual opening meetings were held at each of the areas prior to the start of the audit.

1.5 Previous Internal Audit Findings

Previous internal audit findings were not reviewed, as many of the associated corrective actions are still in progress. Some of the previous audit findings have been closed, but did not require verification.

1.6 Summary of Previous External Audit Findings

Not applicable. The Wastewater QMS is not subject to external auditing at this time.

1.7 Interviews

The following Operating Authority staff were interviewed as part of the Internal Audit:

- Robert Daw, Area 1 Wastewater Operations Manager
- Wes Foebel, Biosolids Manager
- Jim Chisholm, Area 1 Wastewater System Operator
- Christina Bellon-Graves, Area 1 Wastewater System Operator
- Michael Hall, Area 1 Wastewater System Operator
- Jason Pepperall, Area 1 Wastewater Maintenance Manager (Acting)
- Kristel Stevenson, Area 2 Wastewater Operations Supervisor
- Michael MacLean, Area 2 Wastewater System Operator
- Tyler Mook, Area 2 Wastewater System Operator
- Mike Coleman, Area 2 Wastewater System Operator
- Frank Vasko, Area 2 Wastewater Maintenance Manager
- Aaron Lounsbury, Area 2 Wastewater Maintenance Assistant 1
- Gerry Atkinson, Area 3 Wastewater Operations Manager
- Barry Robbins, Area 3 Wastewater Maintenance Manager
- Mike Wedekind, Area 3 Wastewater System Operator
- Don Smith, Area 3 Wastewater System Operator
- Brent Abernethy, Area 3 Wastewater System Operator
- Andrew Braham, Area 3 Wastewater System Operator
- Joe Tonellato, Director, W-WW (*Top Management*)
- Doug Johnson, Associate Director (Acting), Wastewater Operations, Maintenance, and Laboratory Services (*Top Management*)

- Craig Courteau, Associate Director, W-WW Integrated Systems (*Top Management*)
- Tony Cimino, Associate Director, W-WW Engineering (*Top Management*)
- Richard Pinder, Associate Director, W-WW Asset Management (*Top Management*)
- Rachel Whyte, W-WW Quality Management Specialist (*Backup QMS Representative – Wastewater*)
- Michelle Max, W-WW Quality Management Specialist (*QMS Representative – Wastewater*)
- Alyshia Tuomi, Manager, W-WW Capital Program Planning
- Courtney Reuvers, W-WW Capital Planning Specialist
- Will Belancic, Supervisor, Water-Wastewater Maintenance Support
- Ray Waters, CMMS System Administrator
- Jennifer McDowell, Maintenance Asset Analyst
- Berny Portolesi, Manager, Technical Trades (Instrumentation)
- Glenn Fulton, Supervisor, Asset Performance

2.0 INTERNAL AUDIT RESULTS

2.1 Types of Audit Findings

In documenting audit findings, the following terms and abbreviations are used:

- **C – Conformance:** Audit interviews and sampled records indicate that QMS requirements are met and applicable procedures are implemented as written.
- **NC – Non-conformance:** Audit interviews and sampled records indicate that a requirement of the QMS Standard was not met or a documented procedure was not implemented as written.
- **OFI – Opportunity for improvement:** Conformance was generally observed, but there may be an opportunity to enhance existing processes.

2.2 Summary of Findings

23 non-conformances were identified during the audit relating to document and records control; roles, responsibilities, and authorities; competencies; personnel coverage; communications; essential supplies and services; infrastructure maintenance; sampling, testing, and monitoring; instrument calibration; emergency management; and continual improvement.

29 opportunities for improvement were identified during the audit relating to delegation of QMS Representative responsibilities; document and records control; risk assessment; competencies; personnel coverage; essential supplies and services; infrastructure maintenance; sampling, testing, and monitoring; instrument calibration; emergency management; and continual improvement.

Table 3 provides a summary of findings from the QMS Internal Audit.

NOTE: Internal audit findings from previous audits that were identified again in the 2019 audits may not be noted in the list below, as corrective action activities are already in progress and the required records have already been opened in EtQ.

Table 3: Summary of Findings – 2019 Internal Audit

Type	Details	Number
Element 1: Operational Plan		
C	No findings identified	---
Element 2: QMS Policy		
C	No findings identified	---
Element 3: Commitment and Endorsement		
C	No findings identified	---
Element 4: QMS Representative		
OFI	Legislative changes are communicated by email and within SOPs, but no formal procedure exists to document the communication process. Consider documenting the process as a controlled procedure.	2019-030-Audit Internal
Element 5: Document and Records Control		
NC	<p>Document and Records Control (QMS-WW-ALL-P-050, rev1, 30Sep2019) identifies Operator certifications as controlled records and specifies that they are to be posted at “respective WWTPs”. Auditors observed posted certificates at Area 2 facilities and identified several issues:</p> <ul style="list-style-type: none"> • Certificates for Tyler Mook (Class 2 Operator, Welland WWTP) not posted at Welland WWTP; • Certificates for Kristel Stevenson (Class 4 Operator, Area 2 Wastewater Operations Supervisor) not posted at Welland or Seaway WWTP; 	WWCAR-19-001

Type	Details	Number
	<ul style="list-style-type: none"> Certificates for Lovedeep Singh Multani (Operator-in-Training, currently working at Seaway WWTP) not posted at Seaway WWTP. 	
NC	<p>Document Control (QMS-WW-ALL-P-050, rev1, 30Sep2019) specifies that only current documentation should be available for use. There were several outdated documents found at Baker Road WWTP:</p> <ul style="list-style-type: none"> Informal, unapproved contact lists were found on the control room bulletin board; Water and Wastewater Emergency Contact List (ERP-ALL-ALL-T-002) – 2018 version found in control room, current version is rev14 (30Sep2019); Uncontrolled, hand-edited pump station sheets were located in a binder in the control room. 	WWCAR-19-002
NC	<p>Document Control (QMS-WW-ALL-P-050, rev1, 30Sep2019) specifies that only current documentation should be available for use. There were several outdated documents found at the Welland and Seaway WWTPs.</p> <p><u>Welland WWTP:</u></p> <ul style="list-style-type: none"> Bulk Chemical Deliveries (OP-ALL-ALL-P-001) – rev5 found in Emergency Response Plan binder in control room, current version is rev7; Threat to a Water or Wastewater Facility, System, or Supply (ERP-ALL-ALL-T-002) – rev1 found in Emergency Response Plan binder in control room, current version is rev2; Several obsolete Water Operations procedures were found in the Emergency Response Plan binder in the control room, including Watermain Break, Watermain Shutdown and Break Repair, Confirmed Adverse Drinking Water Quality Results, Emergency Laboratory Services for Non-Bacteriological Sampling, and Initial Response to an Adverse Water Quality Result; An obsolete "Spill Reporting" binder was found on the shelf in the control room; it contained outdated, uncontrolled and unapproved response instructions and outdated manager contact information. 	WWCAR-19-003

Type	Details	Number
	<p><u>Seaway WWTP:</u></p> <ul style="list-style-type: none"> • Seaway WWTP Process Schematic (QMS-WW-SW-V-060) – rev2 found in control room, current version is rev3; • Bypass, Overflow, and Spill Notification and Reporting (OP-WW-ALL-P-038) – rev0 found in control room, current version is rev2; • Personnel Coverage (QMS-WW-ALL-P-110) – rev1 found in control room, current version is rev2; • Seaway WWTP System Schematic (QMS-WW-SW-V-061) – rev5 found in control room, current version is rev6; • Water and Wastewater Emergency Contact List (ERP-ALL-ALL-T-002) – 22Mar2016 version found in control room, current version is rev14 (30Sep2019); • WWTP Logbook Entries and Review (OP-WW-ALL-P-024) – rev0 found in control room, current version is rev1; • Maintenance After-Hours Call-In Process – Additional Support (Wastewater) (OP-WW-ALL-V-002) – copy posted on wall in control room has been trimmed to remove document control information; • Complaints – Wastewater (OP-WW-ALL-P-005) – rev3 found in control room, current version is rev4. 	
NC	<p>Bypass, Spill, and Overflow Notification and Reporting (OP-WW-ALL-P-038, rev2, 1Mar2018) outlines the processes in place for addressing, reporting, and communicating bypasses, planned and unplanned spills, and overflows. Deficiencies were identified with the documented procedure as follows:</p> <ul style="list-style-type: none"> • Section 5.2.2 of the procedure specifies that the Incident Manager is required to provide a spill report to MECP and ECCC within 10 working days of the event. In practice, a request can be placed with MECP to extend the 10-day deadline to accommodate additional activities (e.g., debriefs, etc.). • The procedure does not outline how the Wastewater Compliance Technologist is made aware of planned and unplanned spills. • Section 5 of the procedure states that samples are required to be collected for all planned and unplanned bypasses, spills, and overflows. Samples were not collected for the ferric spills at Niagara Falls WWTP or for 	WWCAR-19-004

Type	Details	Number
	<p>the planned biogas spill at Seaway WWTP. Additionally, operators at Niagara Falls WWTP do not collect bypass samples at remote stations.</p> <ul style="list-style-type: none"> Consider clarifying in Sections 5.1.2 and 5.2.1 that SAC s notified via telephone and Public Health is notified via email. Consider clarifying the conditions under which a spill does or does not need to be reported, or refer to other SOPs where this is identified. Consider creating a controlled checklist for responding to bypass, overflow, or spill events. 	
NC	The requirements of Clean-Up of Sewage Spills (OP-WW-ALL-P-004, rev4, 13Oct2016) do not align with the requirements outlined in Bypass, Spill, and Overflow Notification and Reporting (OP-WW-ALL-P-038, rev2, 1Mar2018) , and in some cases are contradictory.	WWCAR-19-005
NC	Mandatory Training (QMS-WW-ALL-100, rev0, 7Feb2014) identifies the Mandatory Training Table (QMS-WW-ALL-101) as the document that outlines mandatory training for staff. This reference is outdated, as mandatory training requirements for staff affecting wastewater are now included within the Competencies Table (QMS-ALL-ALL-T-100, rev7, 26Jul2018) .	WWCAR-19-006
NC	Essential Supplies and Services (QMS-WW-ALL-130, rev2, 2Mar2015) specifies that “a list of all the essential supplies and services associated with operational functions are listed in...the Essential Supplies & Services Table (QMS-WW-ALL-131) ”. This reference is outdated, as the Essential Supplies and Services Table is now available as an electronic Vine page.	WWCAR-19-007
OFI	Consider removing specific details of spill reporting processes from Trunk Sewer or Forcemain Break Investigation and Repair (OP-WW-ALL-P-017, rev1, 16Dec2016) and instead include a reference out to Bypass, Overflow and Spill Notification and Reporting (OP-WW-ALL-P-038) .	2019-031-Audit Internal
OFI	An auditee at the Welland WWTP noted that there were staffing shortages on 8Sep2019 that required him to assume care and control of Seaway WWTP and Crystal Beach WWTP and operate all three plants from the Welland WWTP. A review of logbook entries and access control showed that	2019-032-Audit Internal

Type	Details	Number
	the auditee does not have access to update the logbooks for the Seaway and Crystal Beach WWTPs. It may be beneficial to ensure that all WWTP Operators within each area have access to logbooks for the facilities over which they may be asked to assume care and control.	
OFI	An auditee at the Welland WWTP stated that details of bypass events are logged in plant logbooks (eRIS) and on the plant log sheet. Relevant information is also entered on a paper-based log titled "Welland WWTP Oct 2019". If this paper log is needed or useful to staff, it may be beneficial to add a more descriptive name to the form so that its purpose and use may be easily identified.	2019-033-Audit Internal
OFI	Several recommendations for improvement were received from auditees relating to controlled QMS document formatting and access: <ul style="list-style-type: none"> Consider creating a link to the Essential Supplies and Services page in a more conspicuous location on Vine. Consider including links to relevant ECAs on each of the area e-boards. Reorganize the "Contractors" section of the Emergency Response Plan Contact List (ERP-ALL-ALL-T-002, rev14, 30Sep2019) to more clearly identify the types of services provided by each contractor. 	2019-034-Audit Internal
OFI	Several recommendations for improvement were received from auditees relating to controlled record access: <ul style="list-style-type: none"> Advise Operations and Maintenance Managers of where debrief records are stored, how they can be accessed, and what supporting information should be stored with the debrief record. Provide Operators with access to spill reports. 	2019-035-Audit Internal
OFI	Consider improvements to the process for recording and accessing bypass data (e.g., dates, volumes, etc.). The data is stored in several locations, needs to be transcribed into several systems (which can lead to errors), and staff find the overall process to be confusing.	2019-036-Audit Internal
OFI	The Asset Performance Team has several procedures in place to ensure that field work is undertaken consistently. These documents are currently uncontrolled and saved to the L: drive. It may be beneficial to include these procedures within the controlled document structure in EtQ.	2019-037-Audit Internal

Type	Details	Number
Element 6: Wastewater System		
C	No findings identified.	---
Element 7: Risk Assessment		
OFI	Wastewater System Risk Assessment (QMS-WW-ALL-P-070, rev2, 7Feb2019) identifies that the Wastewater Compliance Technologist takes the lead in facilitating risk assessment activities. This responsibility was transferred to the W-WW Quality Management Specialist (WW) for the 2019 review. The procedure should be revised to reflect this change in process ownership.	2019-038-Audit Internal
Element 8: Risk Assessment Outcomes		
<i>Not applicable</i>		
Element 9: Organizational Structure, Roles, Responsibilities & Authorities		
NC	The Wastewater QMS Operational Plan (QMS-WW-ALL-MAN-010, rev2, 28Mar2019) identifies personnel filling key QMS roles, including the roles of the QMS Representative and Top Management. Numerous auditees were not able to identify the personnel in these positions. There is an opportunity to improve recognition of these key QMS roles.	WWCAR-19-008
Element 10: Competencies		
NC	The Competencies Table (QMS-ALL-ALL-T-100, rev7, 26Jul2018) requires that Wastewater QMS training be taken within six months of hire and once every three years on a continual basis. Across all audit areas, most auditees did not have up-to-date Wastewater QMS training.	WWCAR-19-009
OFI	Almost all auditees brought up in discussion that onboarding is less than desirable: <ul style="list-style-type: none"> The process for SOP retrieval is not being captured in onboarding. Audit interviews indicate that new staff are not being introduced to and/or retaining knowledge of basic QMS concepts. New staff are not familiar with mandatory training requirements. 	2019-039-Audit Internal
OFI	There is an opportunity to provide additional training for Operations staff on key bypass, spill, and overflow concepts, including:	2019-040-Audit Internal

Type	Details	Number
	<ul style="list-style-type: none"> Definitions of key terms (planned spill, unplanned spill, planned bypass, unplanned bypass, overflow), and the practical differences between these events; The purpose of Public Health notification in spill, bypass, and overflow events; Timing of notifications to Public Health (“forthwith”); Reinforcement of reporting requirements and protocols. 	
OFI	It may be beneficial to establish a routine process for the review of training records to identify outstanding staff whose mandatory training is overdue or outstanding.	2019-041-Audit Internal
Element 11: Personnel Coverage		
NC	Call-In and Overtime Management (OP-ALL-ALL-P-003, rev3, 11Jun2019) specifies that additional staff are to be called in by the On-Call Manager. An auditee in Area 3 indicated that he/she has been asked to complete these call-ins in the past.	WWCAR-19-010
OFI	Operations Management may wish to consider overlapping Operator shifts by 30min to ensure that there is adequate opportunity for proper communication at shift change.	2019-042-Audit Internal
OFI	Personnel Coverage (QMS-WW-ALL-P-110, rev2, 26Jul2018) states that “Sectional Management Teams review personnel coverage semi-annually so that any staffing-related concerns and recommendations can be put forward to Top Management as part of the Management Review. Based on the results of the review, Top Management may recommend seeking budget increases if more personnel are required.” Workforce planning is not currently completed in an all-encompassing manner on a semi-annual basis through Management Review; rather, it is completed as part of the annual budgeting process.	2019-043-Audit Internal
Element 12: Communications		
NC	Communications (QMS-WW-ALL-P-120, rev1, 25Aug2017) indicates that the Wastewater QMS Policy is to be posted in an accessible location at each wastewater treatment facility. Auditors toured the administration building at the Welland WWTP and did not observe a copy of the Wastewater QMS policy posted at this facility.	WWCAR-19-011
NC	MECP authorized a planned spill of digester gas at the Seaway WWTP to begin on or after 25Apr2019; the MECP authorization included a request that the spill be reported to	WWCAR-19-012

Type	Details	Number
	SAC at time of occurrence. Logbook records for Seaway WWTP on Fri, 26Apr2019 note that "[Digester] #2 gas now vented to atmosphere", however, there is no record in the logbook of a call having been placed to SAC to notify them of the spill.	
Element 13: Essential Supplies and Services		
NC	The Essential Supplies and Services page identifies the Biosolids Management Agreement as having expired. However, biosolids management is currently under a three-year agreement expiring 31Dec2019, and the Biosolids Manager was unsure who is responsible for updating the updates the Essential Supplies and Services List.	WWCAR-19-013
NC	Communications (QMS-WW-ALL-P-120, rev1, 25Aug2017) specifies that "Top Management communicates with Essential Suppliers to ensure that they are informed of relevant aspects of the Region's QMS". Wastewater laboratory benchtop and handheld instrument calibration is identified as an essential service on the Essential Supplies and Services page ; this service is secured through sole-source PO on an annual basis currently open to ClearTech until 2020. There is no evidence that information about the Region's QMS was provided to ClearTech, whether in scoping documentation or otherwise.	WWCAR-19-014
OFI	It may be beneficial to conduct a review of the supplies and services identified on the Essential Supplies and Services page to ensure that the list remains current and relevant, and that additional essential supplies/services are not missing from the list (e.g., vacuum trucks, construction contractors, etc.).	2019-044-Audit Internal
Element 14: Review and Provision of Infrastructure		
C	No findings identified.	---
Element 15: Infrastructure Maintenance, Rehabilitation and Renewal		
NC	Trunk Sewer or Forcemain Break Investigation and Repair (OP-WW-ALL-P-017, rev1, 16Dec2016) states that wastewater system failure reports need to be closed within 10 days of discovery of the failure. As of 30Oct2019, 7 failure reports remain open with initiation dates ranging from June 2017 – June 2019.	WWCAR-19-015

Type	Details	Number
NC	<p>Trunk Sewer or Forcemain Break Investigation and Repair (OP-WW-ALL-P-017, rev1, 16Dec2016) states that "Wastewater System Failure Reports are required as part of wastewater system inspections" and that GroupEAM opens these reports upon receipt of break site GIS coordinates from the field. The failure reports are used to establish break frequency and forcemain condition rating, which are in turn used as input to capital planning.</p> <p>EAM shows records of a forcemain break in the area of the South Side Low Lift SPS (Niagara Falls) in May 2018. The forcemain break was recorded using a regular work order, and not a Wastewater System Failure Report as required. (NOTE: since identifying this non-conformance, a failure report has been initiated.)</p>	WWCAR-19-016
OFI	It may be beneficial to clarify whether a wastewater system failure report (or water system failure report) is required if the break occurs on the property of a water or wastewater facility. The auditors found evidence of two main breaks at regional facilities that were not recorded using a system failure report (w/o #538640, watermain break outside Front St. SPS; w/o #594592, effluent forcemain break at Port Dalhousie WWTP).	2019-045-Audit Internal
OFI	Where planned spills are required in order to complete maintenance work (e.g., planned spill of digester gas at Seaway WWTP), there is an opportunity to streamline recordkeeping by linking associated EAM work order records with the corresponding EtQ spill reporting records.	2019-046-Audit Internal
OFI	Work orders initiated by Operations staff are routed to the Operations Manager for approval before being sent to the Maintenance Manager. It may be beneficial to adjust EAM permissions and/or create workflows to define how these work orders can be forwarded in the Operations Manager's absence (e.g., vacation, illness, etc.). At present, the work orders will remain in the Operations Manager's EAM inbox until his return to work.	2019-047-Audit Internal
OFI	<p>It may be beneficial to clarify the process for introducing new assets and instrumentation into EAM, including:</p> <ul style="list-style-type: none"> • Responsibilities for provision of asset information to GroupEAM; • Asset information that must be provided; • Asset documentation that must be provided; 	2019-048-Audit Internal

Type	Details	Number
	<ul style="list-style-type: none"> In the case of new instrumentation, any initial calibration reports and indication of the applicable calibration program for the subject asset; How to ensure that the asset is appropriately inventoried and tagged. 	
Element 16: Sampling, Testing and Monitoring		
NC	Area 3 Operations staff indicated that there are agreements/requirements in place to contact affected Area Municipalities when wet wells at selected sewage pumping stations reach certain levels. This requirement was not noted in any controlled procedure reviewed by the auditors.	WWCAR-19-017
OFI	The chain of custody used for bypass sampling at Welland WWTP includes notation of samples collected at the end of the bypass event. The auditees stated that they do not collect samples at the end of a bypass, and a review of the Welland WWTP Environmental Compliance Approval confirmed that end-of-event sampling is not required. It may be beneficial to remove the end-of-event sampling items from the chain of custody template for this facility.	2019-049-Audit Internal
OFI	All WWTPs should work toward full implementation of laboratory waste management procedures (Transport, Storage and Disposal of Waste and Dangerous Goods, HS-ALL-ALL-P-037, rev0, 29Oct2018). At several plants (Welland WWTP, Seaway WWTP, Baker Road WWTP), auditors noted that the provided containers for laboratory waste were found to be unlabelled or not in use, and one auditee noted that a certain type of hazardous waste is routinely thrown directly into municipal garbage.	2019-050-Audit Internal
OFI	It may be beneficial for the Wastewater Compliance Technologist to include all in-plant process sampling on the WWTP-specific compliance sampling schedules. This may help to eliminate confusion over sampling requirements, to designate specific days for sampling as a means of division of labour, and to evaluate sampling frequencies to determine if they can be reduced as appropriate.	2019-051-Audit Internal
OFI	It may be beneficial to consider the installation of a SCADA alarm at Port Dalhousie WWTP that would alert the WWTP Operator if the secondary bypass valve is in the open position while plant influent flows are below plant capacity (100MLD). At present, the secondary bypass valve is manually operated,	2019-052-Audit Internal

Type	Details	Number
	and there is potential for it to be inadvertently opened and/or left in the open position for longer than required.	
OFI	It may be beneficial to investigate technologies that could flag for WWTP Operators when the dechlorination pumps have failed. Previous investigations indicated that alarming was not possible due to pump age, but there may be alternate technologies (e.g., flow meters, etc.) that can achieve this goal. There is a risk of non-compliance if the pumps fail and chlorinated water is released to the environment.	2019-053-Audit Internal
Element 17: Measurement/Recording Equipment Calibration and Maintenance		
NC	Wastewater Calibration (QMS-WW-ALL-170, rev0, 25Jun2014) specifies that DO meters and ORP meters are calibrated annually. In practice, auditees indicated that DO and ORP are calibrated on an as-needed basis.	WWCAR-19-018
NC	Section 5.3 of Determination of pH and Temperature in Wastewater (OP-WW-ALL-P-007, rev3, 11Oct2017) states that "bench-top and/or portable pH meter[s] should be calibrated every day, or as used, before any lab work or sample collection is performed". Auditors in Area 1 WW and Area 3 WW did not see evidence to show that bench-top pH meters are being calibrated daily or on an as-used basis, despite the fact that plant lab sheets regularly include results of bench-top pH testing.	WWCAR-19-019
NC	Several issues were identified in the plant laboratory at Welland WWTP: <ul style="list-style-type: none"> The bench-top pH meter (Thermoscientific Orion Star AIII - serial #J17006, calibrated 16May2019) is not asset-tagged. EAM records show that a HACH DR1900 spectrophotometer with serial #161060001002 is assigned to Welland WWTP. At the WWTP, a different HACH DR1900 unit is installed (serial #163370001002); this instrument is also missing an asset tag. EAM records show that a HACH DR2800 spectrophotometer is assigned to Welland WWTP. This device was not found on the bench in the lab. A Mettler scale (AE200, serial #F52464, calibrated 17May2019) is not asset-tagged or listed in EAM. An expired bottle of Rochelle salt stabilizer for ammonia determination was found on the bench (expired Dec2018). 	WWCAR-19-020

Type	Details	Number
	<ul style="list-style-type: none"> An expired QC standard for total phosphorus was found on the bench (expired Jan2019). The plant lab eyewash station does not have an inspection tag. <p>Several issues were identified in the plant laboratory at Seaway WWTP:</p> <ul style="list-style-type: none"> The pH meter (VWR, serial #D00182, calibrated 16May2019) is not asset-tagged. The HACH DR1900 spectrophotometer (serial #161060001020, calibrated 16May2019) does not have an asset tag. Expired blue pH buffer solution was found on the shelf (4Oct2019). Expired sulfite reagent was found on the shelf (Aug2019). 	
OFI	Auditees observed that there is inadequate instrumentation available for monitoring of wastewater remote stations, and that additional flow meters, pressure gauges, etc. would help WWTP Operators to be able to identify spills or forcemain breaks more readily.	2019-054-Audit Internal
OFI	New COD reactors were observed in the plant laboratories at both Port Dalhousie and Port Weller WWTPs. Records indicate that the reactor at Port Dalhousie was purchased 2 months ago, and auditors found an original manufacturer's certificate of calibration; however, the reactor is not tagged with an asset number or a calibration sticker, and it could not be located in EAM.	2019-055-Audit Internal
Element 18: Emergency Management		
NC	<i>Bypass, Overflow, and Spill Notification and Reporting (OP-WW-ALL-P-038, rev2, 1Mar2018)</i> identifies that the Incident Manager can be the Operations Manager (if the spill occurs on the grounds of the main facility) or the Maintenance Manager (if the spill occurs in the collection system). The procedure also specifies that the Incident Manager is required to provide a written report of the spill to MECP and ECCC. During the audit, auditors observed confusion regarding assignment of the Incident Manager role, including assignment of responsibilities for reporting the spill to SAC and for completing the spill report. As a result, spill reports are not consistently being prepared by the appropriate	WWCAR-19-021

Type	Details	Number
	manager (i.e., Operations or Maintenance, depending on the spill location).	
NC	Post-Event Debriefing (ADM-ALL-ALL-P-009, rev2, 11Jul2017) specifies that the W-WW Incident Manager is responsible for leading debriefs and preparing associated records. In practice, these activities are conducted by the Wastewater Compliance Technologist or the Water-Wastewater Quality Management Specialist. In addition, auditees commented that the significance test outlined in the procedure may be too onerous for wastewater incidents (particularly in relation to forcemain breaks).	WWCAR-19-022
OFI	There is an opportunity to improve spill protection at Port Dalhousie WWTP by making spill mats available in the chemical delivery areas and enforcing their use.	2019-056-Audit Internal
OFI	It is recommended that staff of the Capital Program Planning group be invited to attend debriefs where an infrastructure improvement may be required to address the root cause of the event.	2019-057-Audit Internal
Element 19: Internal Audit		
C	No findings identified.	---
Element 20: Management Review		
C	No findings identified.	---
Element 21: Continual Improvement		
NC	Since 2017, 36 corrective actions have been identified through the wastewater internal audit process and entered into the corrective action database. Of the 36 corrective actions, 26 are in “open” status. Wastewater Corrective Action (QMS-WW-ALL-210, rev0, 30Oct2013) states that preliminary corrective action information is entered into the record, and then “the Lead Auditor assigns the CAR to the responsible individual and identifies a date for completion of the Investigation and Root Cause Analysis”. All open corrective actions in the database are currently assigned to the Lead Auditor and not the “responsible individual” as identified in the procedure.	WWCAR-19-023
OFI	Post-Event Debriefing (ADM-ALL-ALL-P-009, rev 2, 11Jul2017) states that actions items generated through debrief activities “are to be recorded, assigned, and managed in EtQ as per the Corrective Action Procedure...(QMS-WW-	2019-058-Audit Internal

Type	Details	Number
	ALL-P-210 for wastewater)". Consider revising Wastewater Corrective Action (QMS-WW-ALL-210, rev0, 30Oct2013) to include roles and responsibilities for corrective action assignment when non-conformances/action items are identified outside of internal audits.	

3.0 QUESTIONS AND CONCERNS

Please contact [Rachel Whyte](#), W-WW Quality Management Specialist, x3787, to discuss any questions or concerns about the audit findings.

The Regional Municipality of Niagara

**Water
Quality Management System
Operational Plan**

(QMS-WT-ALL-MAN-010)

For the:

Decew Falls/Niagara Falls Drinking-Water System
Grimsby Drinking-Water System
Port Colborne Drinking-Water System
Rosehill Drinking-Water System
Welland Drinking-Water System

Effective Date: December 12, 2019

Revision Number: 10



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Appendix 3	Drinking Water System Process Schematics: <ul style="list-style-type: none"> • Decew Falls/Niagara Falls Drinking Water System Process Schematic (QMS-WT-DN-V-060) • Grimsby Drinking Water System Process Schematic (QMS-WT-GR-V-060) • Port Colborne Drinking Water System Process Schematic (QMS-WT-PC-V-060) • Rosehill Drinking Water System Process Schematic (QMS-WT-RH-V-060) • Welland Drinking Water System Process Schematic (QMS-WT-WE-V-060)
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1. Introduction

1.1 *Drinking Water Quality Management Standard*

The Municipal Drinking Water Licensing Program is established under the *Safe Drinking Water Act, 2002*. This licensing program requires drinking water system owners to incorporate the concept of quality management into their operations, as mandated by the Drinking Water Quality Management Standard (DWQMS).

The DWQMS focuses on a proactive and preventive approach for the management of drinking water quality using the four-step “PLAN – DO – CHECK – IMPROVE” process. Under the DWQMS, all municipal residential drinking water systems are required to develop and implement a quality management system (QMS) that must be documented in an Operational Plan.

1.2 *Niagara Region*

The Regional Municipality of Niagara (“Niagara Region”) owns and operates five drinking water systems that treat and transmit safe drinking water to eleven area municipalities: the Cities of St. Catharines, Niagara Falls, Welland, Port Colborne; the Towns of Grimsby, Lincoln, Thorold, Pelham, Fort Erie, Niagara-on-the-Lake; and the Township of West Lincoln. The area municipalities own and operate distribution systems that deliver water to the consumers in Niagara.

Niagara Region is committed to producing safe drinking water and has implemented a QMS in support of its drinking water systems.

1.3 *Scope*

This Operational Plan documents the QMS for Niagara Region’s five drinking water systems:

- Decew Falls / Niagara Falls Drinking Water System
- Grimsby Drinking Water System
- Port Colborne Drinking Water System

- Rosehill Drinking Water System
- Welland Drinking Water System

For the purpose of this Operational Plan and associated procedures:

- **All Staff** includes all staff employed by Niagara Region
- **All Operating Authority Staff** includes all staff within the Water and Wastewater Services Division *except* those who only work in wastewater systems (i.e. Wastewater Operators, Managers, and assigned Maintenance staff)
- **Staff who directly affect drinking water quality** include:
 - Associate Director, Water Operations, Maintenance & Staff Development
 - Water Operations Managers & Supervisors
 - Water Operators, Operators-in-Training, and Support Staff
 - System Maintenance Managers & Supervisors (Water)
 - System Maintenance Staff (Water)
 - Manager of Water Quality & Compliance
 - Water Quality and Compliance Staff (including Water-Wastewater Quality Management Specialist)
 - Manager of Technical Trades
 - Skilled Trades Managers
 - Contract Administrators
 - Water-Wastewater Safety Advisor
 - Water-Wastewater Training Advisor
 - Education and Engagement Staff
 - Senior Project Managers, Design and Construction
 - Project Managers, Design and Construction
- **Ministry** refers to the Ministry of the Environment, Conservation, and Parks.

2. Quality Management System Policy

Niagara Region is committed to **WATER** and our QMS Policy is shown below.

Figure 1: Water Quality Management System Policy¹



Niagara Region has implemented a
Quality Management System (QMS)
to demonstrate our dedication to providing consumers
with high quality drinking water.

The Region is committed to:

Working to ensure the QMS is maintained and continually improved

abiding by all relevant legislation and regulations

treating and producing water that is clean and safe

educating the public about the importance of water

respecting Niagara's most precious resource – water

Niagara  Region

www.niagararegion.ca

¹ March 31, 2015 – Revision 1

3. Commitment and Endorsement

3.1 Top Management

Each member of Top Management pledges commitment to the Water QMS and endorses the Operational Plan through the signing of a Commitment and Endorsement Memorandum. The Memorandum includes a pledge to ensure the implementation, maintenance and continual improvement of the QMS for each of Niagara Region's drinking water systems as documented in this Operational Plan.

3.2 Owner

As System Owner, Niagara Region shall ensure the implementation, maintenance and continual improvement of the QMS for each of its drinking water systems, as documented in this Operational Plan.

By signing below, Regional Council (represented by the Regional Chair and Clerk) endorse the contents of this Operational Plan.

The Regional Municipality of Niagara

Per:

Regional Chair
Jim Bradley

Date

Regional Clerk
Ann-Marie Norio

Date

3.3 Continued Endorsement

When changes in Top Management occur, the QMS Representative ensures that a Commitment and Endorsement Memorandum is signed by any new members of Top Management. Top Management receives QMS updates as per [Management Review \(QMS-WT-ALL-P-200\)](#).

The System Owner receives QMS updates as per [Communications \(QMS-WT-ALL-P-120\)](#). Continued endorsement of the Operational Plan is demonstrated through the enactment of a confirmatory by-law preceding each Council meeting. The QMS Representative ensures that Council endorsement is received for the most current Operational Plan following changes in Council due to election.

4. QMS Representative

Top Management has appointed the Water-Wastewater Quality Management Specialist (reporting to the Manager, Quality & Compliance – Water) as the QMS Representative for Niagara Region's drinking water systems. In the event that the Water-Wastewater Quality Management Specialist is unable to fulfil the duties of QMS Representative, the Water-Wastewater Quality Management Specialist (reporting to the Manager, Quality & Compliance – Wastewater) will assume the role and responsibilities.

The QMS Representative's responsibilities include, but are not limited to:

- Administering the QMS by ensuring that processes and procedures needed are established and maintained,
- Reporting to Top Management on the performance of the QMS and any need for improvement,
- In cooperation with all Operating Authority staff, ensuring current versions of documents required by the QMS are being used at all times,
- In cooperation with all Operating Authority staff, ensuring that personnel are aware of all applicable legislative and regulatory requirements pertaining to their duties, and

- Promoting awareness of the QMS throughout the Operating Authority.

5. Document and Records Control

Document and records control is an essential part of the QMS. [Document and Records Control \(QMS-WT-ALL-P-050\)](#) outlines how documents required by the QMS are kept current, legible, readily identifiable, retrievable, stored, protected, retained and disposed of. The procedure also documents how records required by the QMS are kept legible, readily identifiable, retrievable, stored, protected, retained and disposed of.

[Document and Records Control \(QMS-WT-ALL-P-050\)](#) is available on Vine.

6. Drinking Water Systems

6.1 Description of Overall Drinking Water Systems

6.1.1 General

Niagara Region owns and operates five drinking water systems including treatment plants, transmission mains and associated reservoirs, elevated tanks, towers, standpipes, pumping and booster stations. Niagara Region supplies eleven area municipalities with safe and treated drinking water.

Table 1 lists the facilities associated with each of Niagara's drinking water systems, along with the local municipal distribution systems supplied from each system. Rechlorination stations are listed in the appropriate Drinking Water Works Permit.

Drinking water system descriptions are available on Vine (see links in Table 1).

Table 1: Niagara Region's Drinking Water Systems

Water System	Niagara Region Drinking Water System Facilities	Municipal System(s) Supplied
Decew Falls/Niagara Falls (DN) – Decew Falls/Niagara Falls Drinking Water System Description (QMS-WT-DN-P-060)	Brock High Lift Booster Pumping Station Carlton Street Reservoir Decew Falls Water Treatment Plant Fifth Ave. Reservoir and Rechlorination Station Glendale Pumping Station Kent Ave. Reservoir and Booster Pumping Station Line 2 Rechlorination Station (Virgil Rechlorination Facility) Lundy's Lane Elevated Tank Niagara Falls Water Treatment Plant Niagara Stone Road Chlorine Analyzer Station Port Robinson Rechlorination Station Queenston Heights Chlorine Analyzer Station St. David's Standpipe St. David's Rechlorination Station Stanley Ave. Rechlorination Station Thorold South Elevated Tank (Zone 3) Vineland Booster Pumping Station Virgil Elevated Tank Zone 2 Standpipe	Lincoln Niagara Falls Niagara-on-the-Lake St. Catharines Thorold
Grimsby (GR) – Grimsby Drinking Water System Description (QMS-WT-GR-P-060)	Grimsby Water Treatment Plant Hixon Street Reservoir & Pumping Station Lincoln/Grimsby Booster Pumping Station Park Rd Reservoir & Booster Pump Stn Smithville Reservoir, Elevated Tank & Pumping Station (London Rd)	Lincoln West Lincoln Grimsby Hamilton ²

² The Town of Grimsby's distribution system is connected to a small portion of the City of Hamilton's distribution system on Main Street West.

Water System	Niagara Region Drinking Water System Facilities	Municipal System(s) Supplied
Port Colborne (PC) – Port Colborne Drinking Water System Description (QMS-WT-PC-P-060)	Barrick Rd. Elevated Tank Fielden Ave. Reservoir & Booster Pumping Station Port Colborne Water Treatment Plant	Port Colborne
Rosehill (RH) – Rosehill Drinking Water System Description (QMS-WT-RH-P-060)	Central Ave. Elevated Tank Erie Rd. Rechlorination Station Ridgeway Standpipe Rosehill Water Treatment Plant Stevensville Reservoir and Pumping Station	Fort Erie
Welland (WE) – Welland Drinking Water System Description (QMS-WT-WE-P-060)	Bemis Elevated Tank Shoalts Dr. Reservoir and Pumping Station Pelham Elevated Tank Welland Water Treatment Plant	Welland Pelham Thorold

6.1.2 Treatment

The following processes are part of Niagara Region's multi-barrier approach for producing safe drinking water:

Pre-Chlorination

All of Niagara Region's drinking water systems pre-chlorinate their raw water. In the summer (i.e. temperature > 12°C), when zebra mussel infestation is a problem, the water is pre-chlorinated at the intake. When the water temperature is less than 12°C, the water is pre-chlorinated after the intake.

Pre-Treatment (Coagulation, Flocculation and Sedimentation)

A coagulant is added to the raw water to help remove the suspended solids through the flocculation process. After flocculation, the water passes through the settling tanks where the floc is able to settle.

Filtration

Filtration removes debris and particulate remaining in the water after pre-treatment. Filter effluent turbidity is measured continuously to monitor the effectiveness of the filtration process and will alarm if the set point values are exceeded.

Primary Disinfection

Primary disinfection ensures that any potentially pathogenic organisms that are remaining in the water are rendered harmless. Niagara Region's drinking water systems achieve primary disinfection through the use of chlorination (with sodium hypochlorite). Some facilities are also equipped with UV (ultraviolet) disinfection. The effectiveness of the primary disinfection process is continuously monitored on SCADA.

Secondary Disinfection

Secondary disinfection prevents regrowth of micro-organisms within the distribution system. Secondary disinfection is accomplished by adding sufficient sodium hypochlorite to the water to maintain a residual throughout the entire distribution system.

Process Waste Management

Process waste from the pre-treatment and filtration processes is collected and treated prior to being discharged to the environment or sewer.

6.1.3 Transmission

In Niagara, treated water is conveyed through transmission systems, including storage facilities and booster stations, to the local municipal distribution systems.

Niagara Region's transmission systems are illustrated in maps on the [Niagara Navigator \(NIIMS\)](#) system. The NIIMS maps, in combination with the drinking water system descriptions (see Table 1) and the drinking water system process schematics (see Section 6.1.4), provide an overview of the five transmission systems owned and operated by Niagara Region.

6.1.4 Process Flow Charts

Process schematics for each of Niagara Region's drinking water systems are available on Vine as follows:

- [Decew Falls/Niagara Falls Drinking Water System Process Schematic \(QMS-WT-DN-V-060\)](#)
- [Grimsby Drinking Water System Process Schematic \(QMS-WT-GR-V-060\)](#)
- [Port Colborne Drinking Water System Process Schematic \(QMS-WT-PC-V-060\)](#)
- [Rosehill Drinking Water System Process Schematic \(QMS-WT-RH-V-060\)](#)
- [Welland Drinking Water System Process Schematic \(QMS-WT-WE-V-060\)](#)

6.2 Water Source

6.2.1 General Characteristics

All of the source water treated by the Niagara Region is surface water.

General characteristics of each of Niagara Region's drinking water systems are included in each system's respective drinking water system description. Drinking water system descriptions are available on Vine (see links in Table 1).

6.2.2 Common Event-driven Fluctuations, Operational Challenges & Threats

Table 2 lists common event-driven fluctuations and resulting operational challenges and threats that may impact Niagara Region's water systems.

Table 2: Common Fluctuations, Challenges & Threats

Type of Fluctuation	Resulting Operational Challenges and Threats	Action / Control Measure
Seasonal temperature fluctuations	Zebra mussels clogging the intake when raw water temperature >12°C	Pre-chlorination at intake when raw water temperature >12°C

Type of Fluctuation	Resulting Operational Challenges and Threats	Action / Control Measure
Seasonal temperature fluctuations (continued)	Possible taste/odour events in late summer/early fall	Granular Activated Carbon (GAC) filters or Powdered Activated Carbon (PAC)
	Frazil ice may occur when water temperature is around 0°C ³	Cleared by contracted diving team
Event-driven fluctuations	High winds and storm events causing increased raw water turbidity	Continual monitoring & process changes if necessary

Further details of event-driven fluctuations common to each of Niagara Region's drinking water systems are included in each system's respective drinking water system description. Drinking water system descriptions are available on Vine (see links in Table 1).

6.3 Critical Upstream & Downstream Processes

Niagara Region actively participates in source protection activities and initiatives; these source protection initiatives protect the Region's upstream water sources.

Local area municipalities own and operate distribution systems downstream of each of Niagara Region's drinking water systems (see Table 1, page 7).

7. Risk Assessment

A risk assessment procedure has been developed and implemented that:

- Identifies potential hazardous events and associated hazards, including those required by the Ministry;
- Assesses the risks associated with the occurrence of hazardous events;
- Ranks the hazardous events according to their level of risk;

³ Although not all facilities may experience this event, all are equipped to handle it if it should occur.

- Identifies control measures;
- Identifies critical control points (CCPs);
- Identifies a method to verify currency of information;
- Ensures a risk assessment is conducted at least once every three years; and
- Considers the reliability and redundancy of equipment.

[Drinking Water System Risk Assessment \(QMS-WT-ALL-P-070\)](#) is available on Vine.

8. Risk Assessment Outcomes

The Risk Assessment Outcomes Table identifies hazardous events, associated risk scoring, control measures, CCPs and their respective CCLs, procedures for monitoring CCLs, procedures for responding to CCL deviations, and procedures for reporting and recording deviations. [Tracking Critical Control Limit \(CCL\) Deviations \(OP-WT-ALL-P-028\)](#) discusses how CCL deviations are summarized and tracked.

As an output from the Operating Authority's annual Risk Assessment exercises, CCPs for Niagara Region's drinking water systems are identified as:

- [CCP: Coagulant \(Aluminum Sulphate\) Feed \(OP-WT-ALL-P-006\)](#)
- [CCP: Secondary Disinfection \(Distribution Chlorine\) \(OP-WT-ALL-P-007\)](#)
- [CCP: Filter Effluent Turbidity \(OP-WT-ALL-P-008\)](#)
- [CCP: Primary Disinfectant \(Sodium Hypochlorite\) Feed \(OP-WT-ALL-P-009\)](#)
- [CCP: Verification of Primary Disinfection \(OP-WT-ALL-P-010\)](#)

9. Organizational Structure, Roles, Responsibilities and Authorities

Water and Wastewater Services is a division of Niagara Region's Public Works Department and serves as the Operating Authority for the Region's five drinking water systems and their associated facilities. (Refer to Section 1.3 for exclusions.)

- Our Mission Statement: Through dedicated teamwork and commitment, provide high quality, safe and reliable water and wastewater services, while practicing good stewardship of resources to benefit present and future generations.
- Our Role: To deliver clean, safe drinking water to the municipal water distribution network and to provide effective wastewater treatment for the community.

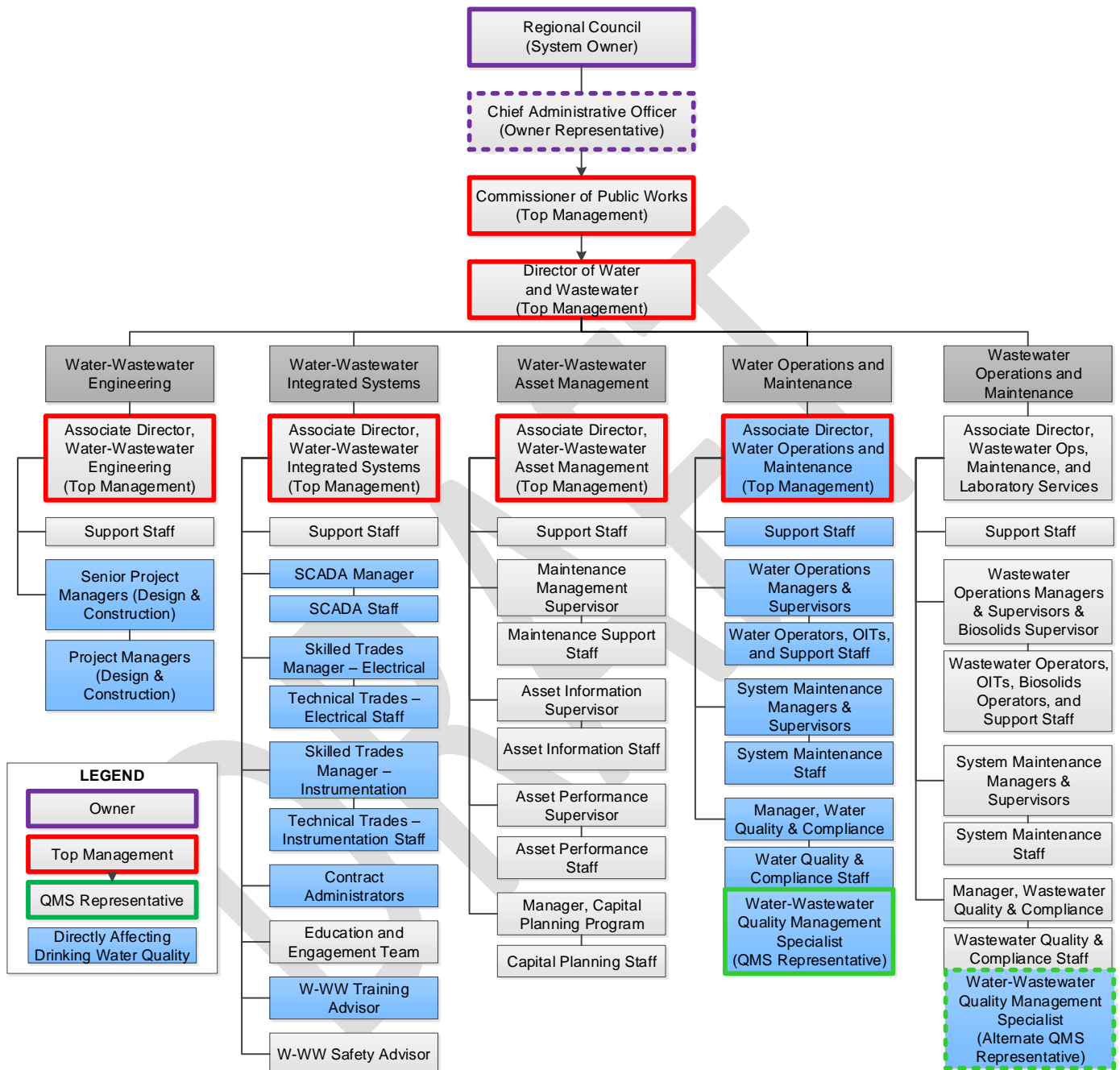
What We Do

The Water and Wastewater Services Division is made up of a dedicated team of approximately 270 employees working throughout the Niagara Region. The Division is divided into **five** groups:

- Water Operations, Maintenance, and Staff Development;
- Wastewater Operations, Maintenance, and Laboratory Services;
- Water-Wastewater Engineering;
- Water-Wastewater Integrated Systems;
- **Water-Wastewater Asset Management.**

The organizational structure of the Water and Wastewater Services Division, including designation/appointment of key QMS roles, is illustrated in Figure 2.

Figure 2: Water and Wastewater Services Division – Organizational Structure



Each of the **five** working groups has varying levels of responsibility for drinking water quality. Core responsibilities of staff in each group, as well as specific duties for those positions that directly impact drinking water quality, are identified in Table 3. Table 3 also identifies

responsibilities of the System Owner, Top Management and the QMS Representative. (NOTE: Positions that are greyed in Table 3 are have been deemed to not directly impact drinking water quality.)

Table 3: Water and Wastewater Services Division – Responsibilities and Authorities

Position/Group	Responsibilities	Authorities
Regional Council (System Owner)	<ul style="list-style-type: none"> – Act as final decision making body for Niagara Region – Ensure the provision of safe drinking water to connected distribution systems of the Local Area Municipalities – Endorse Niagara Region's Water QMS 	<ul style="list-style-type: none"> – Perform listed responsibilities – Delegate
Chief Administrative Officer	<ul style="list-style-type: none"> – Act as representative for the Owner – Interact with Top Management 	<ul style="list-style-type: none"> – Perform listed responsibilities – Delegate
Commissioner of Public Works (Top Management)	<ul style="list-style-type: none"> – Establish and implement operating policy and procedures, covering execution of department functions – Manage Public Works Department in its statutory, operational, custodial and advisory responsibilities – Act as a member of the Corporate Management Team – Participate in Management Review 	<ul style="list-style-type: none"> – Perform listed responsibilities – Discipline staff – Make Engineering decisions – Make administrative decisions related to Public Works – Delegate – Suggest continual improvements
Director of Water and Wastewater (Top Management)	<ul style="list-style-type: none"> – Provide administration and general management of Water and Wastewater Services Division – Ensure mandated delivery of water supply and wastewater treatment meets federal, provincial and municipal requirements – Provide guidance and direction to staff to ensure compliance with provincial standards and the promotion of industry best practices for the operation of the water systems – Participate in Management Review 	<ul style="list-style-type: none"> – Perform listed responsibilities – Establish Divisional priorities; control budgets, costs, and work quality – Take appropriate action to ensure health and safety in emergencies – Delegate

Position/Group	Responsibilities	Authorities
Director of Water and Wastewater (continued)	<ul style="list-style-type: none"> – Manage resources to ensure efficient and effective operations 	<ul style="list-style-type: none"> – Suggest continual improvements
Water Operations and Maintenance		
Associate Director, Water Operations, Maintenance, and Staff Development (Top Management) (Directly Affects Drinking Water)	<ul style="list-style-type: none"> – Maintain accountability for execution and direction of all aspects of drinking water system operation and maintenance – Manage Region's water treatment operations and maintenance to ensure compliance with regulatory requirements and ensure due diligence in daily activities – Demonstrate due diligence in daily activities and keep abreast of relevant legislation – Ensure adequate Health & Safety program in place for Water and Wastewater – Analyze and develop annual current and capital budgets to ensure cost-effective operations – Continually review overall function of facilities, personnel, communications and training to achieve high standard of performance – Direct activities related to public relations, evaluating investigations and preparing reports – Ensure staff/personnel issues are dealt with effectively and in a timely manner – Coordinate employee efforts and respond to emergencies and complaints – Provide emergency preparedness leadership – Participate in Management Review – May function as "Overall Responsible Operator (ORO)" as required by O. Reg. 128/04, if appropriately certified to do so 	<ul style="list-style-type: none"> – Perform listed responsibilities – Approve purchases in accordance with approved budget and policies and procedures – Discipline and deal with major personnel matters – Suggest modifications to systems and make changes during construction – Recommend purchase of equipment or services involving major expenditures – Delegate – Suggest continual improvements

Position/Group	Responsibilities	Authorities
Water Operations Managers/ Supervisors <i>(Directly Affects Drinking Water)</i>	<ul style="list-style-type: none"> – Supervise operation of water treatment plants and regional transmission system – Control area budget; procure material/services as needed to ensure efficient operation – Ensure due diligence in daily activities and compliance with regulatory requirements – Participate in Public relations, evaluate investigations and preparing reports – Ensure staff follow safe work practices as outlined in Health and Safety procedures; provide PPE and training as needed – Respond to emergencies and complaints – Function as “Overall Responsible Operator (ORO)” as required by O. Reg. 128/04 	<ul style="list-style-type: none"> – Perform listed responsibilities – Delegate – Discipline and deal with minor personnel matters (<i>Managers only</i>) – Suggest continual improvements
System Operator <i>(Directly Affects Drinking Water)</i>	<ul style="list-style-type: none"> – Perform operational functions – Maintain written and computer based daily records – Perform routine inspections of plant – Prepare work orders for repairs to equipment – Collect and test water samples to monitor/maintain relevant parameters – Serve as “Operator-In-Charge (OIC)” 	<ul style="list-style-type: none"> – Perform listed responsibilities – Suggest continual improvements
System Operator-in-Training <i>(Directly Affects Drinking Water)</i>	<ul style="list-style-type: none"> – Perform duties of System Operator, with conditions: <ul style="list-style-type: none"> ○ Operators-in-Training must perform some responsibilities at the direction of System Operator, as required by O. Reg. 128/04 ○ When an OIT is operating, the ORO shall be designated as OIC 	<ul style="list-style-type: none"> – Perform listed responsibilities – Suggest continual improvements

Position/Group	Responsibilities	Authorities
Support Staff <i>(Directly Affects Drinking Water)</i>	<ul style="list-style-type: none"> – Maintain appropriate control of documents and records – Assist with communications, public relations, investigations and preparing reports as needed by Operations – Clerical functions – Assist with customer service activities, including responding to complaints 	<ul style="list-style-type: none"> – Perform listed responsibilities – Suggest continual improvements
Water Systems Maintenance Managers <i>(Directly Affects Drinking Water)</i>	<ul style="list-style-type: none"> – Direct and supervise Maintenance staff within area during regular, emergency, standby and on-call hours – Demonstrate due diligence in daily activities and ensure compliance with relevant Regulations and Regional Policies – Control budget for area; monitor expenditures and procurement of materials and services – Prepare and modify maintenance schedules to provide for normal maintenance relief, staff training, vacation, lieu time, and sick time – Participate in activities related to public relations, evaluating investigations and preparing reports – Ensure staff follow safe work practices as outlined in Health and Safety procedures; provide PPE and training as needed – Respond to emergencies and complaints – Assist in scoping, design and construction of projects 	<ul style="list-style-type: none"> – Perform listed responsibilities – Delegate – Discipline and deal with minor personnel matters – Suggest continual improvements
Systems Maintenance Staff <i>(Directly Affects Drinking Water)</i>	<ul style="list-style-type: none"> – Respond to maintenance issues (i.e. general systems maintenance, etc.) – May serve as “Operator-In-Charge (OIC)” in the transmission system 	<ul style="list-style-type: none"> – Authority to perform listed responsibilities – Authority to Suggest continual improvements

Position/Group	Responsibilities	Authorities
Manager of Water Quality and Compliance <i>(Directly Affects Drinking Water)</i>	<ul style="list-style-type: none"> – Ensure processes are optimized and maintained – Develop and implement quality sampling program as required in a collection/transmission/distribution system – Act as Lead Auditor – Ensure training program is maintained in order to meet competencies – Ensure staff follow safe work practices as outlined in Health and Safety procedures; provide PPE and training as needed 	<ul style="list-style-type: none"> – Perform listed responsibilities – Delegate – Suggest continual improvements
W&WW Quality Management Specialist <i>(QMS Rep)</i> <i>(Directly Affects Drinking Water)</i>	<ul style="list-style-type: none"> – See QMS Representative Responsibilities in Operational Plan (Section 4) 	<ul style="list-style-type: none"> – Perform listed responsibilities – Suggest continual improvements
Quality & Compliance Staff <i>(Directly Affects Drinking Water)</i>	<ul style="list-style-type: none"> – Technical Support – Process Optimization – Compliance Support 	<ul style="list-style-type: none"> – Perform listed responsibilities – Suggest continual improvements
Supervisor, W&WW Development Program <i>(Directly Affects Drinking Water)</i>	<ul style="list-style-type: none"> – Perform assigned Supervisory functions – Interact with engineering, maintenance, and operations – Ensure due diligence in daily activities and compliance with regulatory requirements – Ensure that staff follow safe working practices – Participate in Public relations, evaluate investigations and preparing reports – Respond to emergencies and complaints – Function as “Overall Responsible Operator (ORO)” as required by O. Reg. 128/04 	<ul style="list-style-type: none"> – Perform listed responsibilities – Discipline and deal with minor personnel matters – Suggest continual improvements – Delegate

Position/Group	Responsibilities	Authorities
Integrated Systems		
Associate Director, Water-Wastewater Integrated Systems	<ul style="list-style-type: none"> – Demonstrate due diligence in daily activities and keep abreast of relevant legislation and regulations – Ensure support of SCADA, Instrumentation, Electrical, Contract Administration, Health and Safety, Training, and Education/Engagement teams and maintenance of related infrastructure and equipment – Analyze and develop annual current and capital budgets to ensure continuity of operations – Continually review overall function of working group to achieve high standard of performance – Direct activities related to public relations, evaluating investigations and preparing reports – Ensure staff/personnel issues are dealt with effectively and in a timely manner – Coordinate employee efforts and respond to emergencies and complaints – Ensure staff follow safe work practices as outlined in Health and Safety procedures; provide PPE and training as needed – Participate in Management Review 	<ul style="list-style-type: none"> – Perform listed responsibilities – Approve purchases in accordance with approved budget and policies and procedures – Discipline and deal with major personnel matters – Suggest modifications to systems – Recommend purchase of equipment or services involving major expenditures – Delegate – Suggest continual improvements
SCADA Manager <i>(Directly Affects Drinking Water)</i>	<ul style="list-style-type: none"> – Manage and administer SCADA resources to achieve Divisional goals and objectives – Control budget for area and procure material and services to provide customers both internal and external, with efficient and cost effective skilled support – Demonstrate due diligence in daily activities and ensure compliance with relevant Regulations and Regional Policies – Participate in activities related to public relations, evaluating investigations and preparing reports – Respond to emergencies and complaints 	<ul style="list-style-type: none"> – Perform listed responsibilities – Delegate – Suggest continual improvements

Position/Group	Responsibilities	Authorities
SCADA Manager (continued)	<ul style="list-style-type: none"> – Ensure staff follow safe work practices as outlined in Health and Safety procedures; provide PPE and training as needed – Scoping, design and construction of projects 	
Skilled Trades Managers (Instrumentation and Electrical) (Directly Affects Drinking Water)	<ul style="list-style-type: none"> – Manage and administer skilled trades resources to achieve Divisional goals and objectives – Control budget for area and procure material and services to provide customers both internal and external, with efficient and cost effective skilled support – Demonstrate due diligence in daily activities and ensure compliance with relevant Regulations and Regional Policies – Participate in activities related to Public relations, evaluating investigations and preparing reports – Respond to emergencies and complaints – Ensure staff follow safe work practices as outlined in Health and Safety procedures; provide PPE and training as needed – Scoping, design and construction of projects 	<ul style="list-style-type: none"> – Perform listed responsibilities – Supervise daily activities of Technical Trades staff – Delegate – Suggest continual improvements
SCADA and Technical Trades Staff (Directly Affects Drinking Water)	<ul style="list-style-type: none"> – Respond to maintenance issues (i.e. electrical problems, SCADA issues, etc.) 	<ul style="list-style-type: none"> – Perform listed responsibilities – Suggest continual improvements
Contract Administrators (Directly Affects Drinking Water)	<ul style="list-style-type: none"> – Review, amend and administer annual contracts for Water-Wastewater Services – Prepare authorizations and approvals for contract and bid awards – Monitor and supervise maintenance projects 	<ul style="list-style-type: none"> – Perform listed responsibilities – Suggest continual improvements

Position/Group	Responsibilities	Authorities
W-WW Training Advisor <i>(Directly Affects Drinking Water)</i>	<ul style="list-style-type: none"> – Develop and maintain divisional training programs 	<ul style="list-style-type: none"> – Perform listed responsibilities – Suggest continual improvements
W-WW Safety Advisor	<ul style="list-style-type: none"> – Develop and maintain divisional health & safety programs 	<ul style="list-style-type: none"> – Perform listed responsibilities – Suggest continual improvements
Education and Engagement Team	<ul style="list-style-type: none"> – Manage divisional communications and public outreach activities 	<ul style="list-style-type: none"> – Perform listed responsibilities – Suggest continual improvements
Engineering		
Associate Director Engineering <i>(Top Management)</i>	<ul style="list-style-type: none"> – Hold accountability for scoping, design and construction of engineering projects connected with Region's water and wastewater systems – Analyze and develop annual current and capital budgets to ensure that operation plans are cost effective – Manage & administer capital project resources to achieve Divisional goals and objectives – Demonstrate due diligence in daily activities and keep abreast of relevant legislation and regulations – Communicate project progress with other working groups within and outside of Water-Wastewater Services – Direct and supervise Senior Project Management staff – Participate in infrastructure planning and review activities – Participate in Management Review – Participate in public relations, evaluations, investigations, and report preparation 	<ul style="list-style-type: none"> – Perform listed responsibilities – Suggest modifications to systems and make changes during construction – Delegate – Discipline and deal with major personnel matters – Suggest continual improvements

Position/Group	Responsibilities	Authorities
Associate Director Engineering (continued)	<ul style="list-style-type: none"> – Ensure staff follow safe work practices as outlined in Health and Safety procedures; provide PPE and training as needed – Respond to emergencies and complaints 	
Senior Project Manager, Design and Construction (Directly Affects Drinking Water)	<ul style="list-style-type: none"> – Lead the scoping, design and construction of large scale projects related to Region's systems – Infrastructure planning and review – Communicate project progress with Management – Control budget for projects and procure material and services as needed to ensure efficient operation – Ensure due diligence in daily activities and compliance with regulatory requirements including assisting with the preparation of applications for approvals and amendments with the Ministry – Participate in infrastructure planning and review activities – Participate in public relations, evaluate investigations and preparing reports – Respond to emergencies and complaints – Assist PMs with issues as required 	<ul style="list-style-type: none"> – Perform listed responsibilities – Suggest continual improvements
Project Manager, Design and Construction (Directly Affects Drinking Water)	<ul style="list-style-type: none"> – Lead the scoping, design and construction of projects related to Region's systems – Infrastructure planning and review – Communicate project progress with Management – Control budget for area and procure material and services as needed to ensure efficient operation – Ensure due diligence in daily activities and compliance with regulatory requirements including assisting with the preparation of applications for approvals and amendments with the Ministry 	<ul style="list-style-type: none"> – Perform listed responsibilities – Suggest continual improvements

Position/Group	Responsibilities	Authorities
Project Manager, Design and Construction (continued)	<ul style="list-style-type: none"> – Participate in infrastructure planning and review activities – Participate in public relations, evaluate investigations and preparing reports – Respond to emergencies and complaints 	
Engineering Support Staff	<ul style="list-style-type: none"> – Maintain appropriate control of documents and records – Assist with communications, public relations, investigations and preparing reports as needed by Engineering – Complete clerical functions – Assist with customer service activities, including responding to complaints 	<ul style="list-style-type: none"> – Perform listed responsibilities – Suggest continual improvements
Asset Management		
Associate Director, Asset Management (Top Management)	<ul style="list-style-type: none"> – Establish and maintain a divisional asset management plan, capital planning, and infrastructure data management for the Region's water and wastewater systems – Oversee collection, review and analysis of operational and maintenance data to ensure all information relating to W-WW infrastructure is acquired, stored, and made available to those in other sections and departments – Develop capital plans for W-WW infrastructure – Develop the 10-year capital forecast – Demonstrate due diligence in daily activities and keep abreast of relevant legislation and regulations – Communicate project progress with other working groups within and outside of Water-Wastewater Services – Direct and supervise Asset Management staff – Participate in Management Review – Ensure staff follow safe work practices as outlined in Health and Safety procedures; provide PPE and training as needed – Respond to emergencies and complaints 	<ul style="list-style-type: none"> – Perform listed responsibilities – Delegate – Discipline and deal with major personnel matters – Suggest continual improvements

Position/Group	Responsibilities	Authorities
Supervisor, Water- Wastewater Maintenance Management	<ul style="list-style-type: none"> – Manage and administer support resources to achieve Divisional goals and objectives – Control budget for area and procure material and services to provide customers both internal and external, with efficient and cost effective skilled support – Demonstrate due diligence in daily activities and ensure compliance with relevant Regulations and Regional Policies – Ensure staff follow safe work practices as outlined in Health and Safety procedures; provide PPE and training as needed – Maintain CMMS program 	<ul style="list-style-type: none"> – Perform listed responsibilities – Discipline and deal with minor personnel matters – Suggest continual improvements
Maintenance Support Staff (CMMS, Clerks)	<ul style="list-style-type: none"> – Maintain appropriate control of documents and records – Assist with communications, public relations, investigations and preparing reports as needed by Maintenance staff – Complete clerical functions – Assist with customer service activities, including responding to complaints 	<ul style="list-style-type: none"> – Perform listed responsibilities – Suggest continual improvements
Asset Information Supervisor	<ul style="list-style-type: none"> – Manage and administer Water & Wastewater GIS (Geographic Information Systems) and IMS (Information Management Systems) to achieve Divisional goals and objectives – Direct and supervise Asset Information staff – Control budget for area and procure material and services as needed to ensure efficient operation – Ensure due diligence in daily activities and compliance with regulatory requirements – Ensure staff follow safe work practices as outlined in Health and Safety procedures; provide PPE and training as needed – Participate in public relations, evaluate investigations and preparing reports – Respond to emergencies and complaints 	<ul style="list-style-type: none"> – Perform listed responsibilities – Discipline and deal with minor personnel matters – Suggest continual improvements

Position/Group	Responsibilities	Authorities
Asset Information Staff	<ul style="list-style-type: none"> – Coordinate the locating of sub-surface Water & Wastewater assets – Review engineering drawings and resolve discrepancies – Tracking and updating asset lifecycle data – Assist with the administration of the Water & Wastewater GIS and IMS 	<ul style="list-style-type: none"> – Perform listed responsibilities – Suggest continual improvements
Supervisor Asset Performance Management	<ul style="list-style-type: none"> – Direct and supervise Asset Performance staff – Manage and administer asset performance resources to achieve Divisional goals and objectives – Participate in infrastructure planning and review activities – Communicate project progress with Management – Control budget for area and procure material and services as needed to ensure efficient operation – Ensure due diligence in daily activities and compliance with regulatory requirements – Ensure staff follow safe work practices as outlined in Health and Safety procedures; provide PPE and training as needed – Participate in public relations, evaluate investigations and preparing reports – Respond to emergencies and complaints 	<ul style="list-style-type: none"> – Perform listed responsibilities – Discipline and deal with minor personnel matters – Suggest continual improvements
Asset Performance Staff	<ul style="list-style-type: none"> – Collect flow measurements, dimensional analysis and visual resources for wastewater systems – Conduct field inspections of assets – Perform emergency locates – Collect spatial coordinates for inclusion into the Water & Wastewater GIS systems – Monitor, maintain and update environmental systems and conduct evaluations for flow and weather 	<ul style="list-style-type: none"> – Perform listed responsibilities – Suggest continual improvements

Position/Group	Responsibilities	Authorities
Manager, Water- Wastewater Capital Planning Program	<ul style="list-style-type: none"> – Manage and administer infrastructure planning and review to achieve Divisional goals and objectives – Direct and supervise Capital Planning staff – Communicate project progress with Management – Control budget for area and procure material and services as needed to ensure efficient operation – Ensure due diligence in daily activities and compliance with regulatory requirements – Ensure staff follow safe work practices as outlined in Health and Safety procedures; provide PPE and training as needed – Participate in public relations, evaluate investigations and preparing reports – Respond to emergencies and complaints 	<ul style="list-style-type: none"> – Perform listed responsibilities – Discipline and deal with minor personnel matters – Suggest continual improvements
Project Manager, Capital Planning	<ul style="list-style-type: none"> – Lead the scoping, design and construction of projects related to Region's systems – Infrastructure planning and review – Communicate project progress with Management – Control budget for area and procure material and services as needed to ensure efficient operation – Ensure due diligence in daily activities and compliance with regulatory requirements including assisting with the preparation of applications for approvals and amendments with the Ministry – Ensure staff follow safe work practices as outlined in Health and Safety procedures; provide PPE and training as needed – Participate in public relations, evaluate investigations and preparing reports – Respond to emergencies and complaints 	<ul style="list-style-type: none"> – Perform listed responsibilities – Suggest continual improvements

Position/Group	Responsibilities	Authorities
Support Staff	<ul style="list-style-type: none"> – Maintain appropriate control of documents and records – Assist with communications, public relations, investigations and preparing reports as needed by Engineering – Complete clerical functions – Assist with customer service activities, including responding to complaints 	<ul style="list-style-type: none"> – Perform listed responsibilities – Suggest continual improvements
Wastewater Operations, Maintenance, and Laboratory Services		
Associate Director of Wastewater Operations, Maintenance, and Laboratory Services	<ul style="list-style-type: none"> – Accountable for execution and direction of all wastewater operations – Manage Region's wastewater treatment operations to ensure compliance with regulatory requirements and ensure due diligence in daily activities – Ensure staff follow safe work practices as outlined in Health and Safety procedures; provide PPE and training as needed Analyze and develop annual current and capital budgets to ensure that operations are cost effective – Continuously review overall function of facilities, personnel, communications and training to achieve high standard of performance – Direct activities related to Public relations, evaluating investigations and preparing reports – Ensure staff/personnel issues are dealt with effectively and in a timely manner – Coordinate employee efforts and respond to emergencies and complaints – Participate in Management Review – May function as "Overall Responsible Operator (ORO)" as required by O. Reg. 129/04 	<ul style="list-style-type: none"> – Perform listed responsibilities – Approve purchases in accordance with approved budget and policies and procedures – Discipline and deal with major personnel matters – Suggest modifications to systems and make changes during construction – Recommend purchase of equipment or services involving major expenditures – Delegate

Position/Group	Responsibilities	Authorities
Wastewater Operations Managers & Supervisors	<ul style="list-style-type: none"> – Supervise operation of wastewater treatment plants and regional collection system – Control budget for area and procure material and services as needed to ensure efficient operation – Ensure due diligence in daily activities and compliance with regulatory requirements – Ensure staff follow safe work practices as outlined in Health and Safety procedures; provide PPE and training as needed – Participate in Public relations, evaluate investigations and preparing reports 	<ul style="list-style-type: none"> – Perform listed responsibilities – Approve purchases in accordance with approved budget and policies and procedures – Discipline and deal with minor personnel matters – Suggest continual improvements
Wastewater Operations Managers & Supervisors (continued)	<ul style="list-style-type: none"> – Respond to emergencies and complaints – Function as “Overall Responsible Operator (ORO)” as required by O. Reg. 129/04 	<ul style="list-style-type: none"> – Issue notice of non-compliance – Delegate
Wastewater Systems Maintenance Managers	<ul style="list-style-type: none"> – Direct and supervise Maintenance staff within area during regular, emergency, standby and on-call hours – Demonstrate due diligence in daily activities and ensure compliance with relevant Regulations and Regional Policies – Control budget for area; monitor expenditures and procurement of materials and services – Prepare and modify maintenance schedules to provide for normal maintenance relief, staff training, vacation, lieu time, and sick time – Participate in activities related to public relations, evaluating investigations and preparing reports – Ensure staff follow safe work practices as outlined in Health and Safety procedures; provide PPE and training as needed – Respond to emergencies and complaints – Assist in scoping, design and construction of projects 	<ul style="list-style-type: none"> – Perform listed responsibilities – Delegate – Discipline and deal with minor personnel matters – Suggest continual improvements

Position/Group	Responsibilities	Authorities
System Operator	<ul style="list-style-type: none"> – Perform operational functions – Maintain written and computer based daily records – Perform routine inspections of plant – Prepare work orders for repairs to equipment – Collect and test wastewater samples to monitor/maintain relevant parameters – Serve as “Operator-In-Charge (OIC)” 	<ul style="list-style-type: none"> – Perform listed responsibilities – Suggest continual improvements
System Operator-in-Training (OIT)	<ul style="list-style-type: none"> – Perform duties of System Operator, with conditions: <ul style="list-style-type: none"> ○ Operators-in-Training must perform some responsibilities at the direction of the System Operator, as per O. Reg. 129/04 ○ When an OIT is operating, the ORO shall be designated as OIC 	<ul style="list-style-type: none"> – Perform listed responsibilities – Suggest continual improvements
Biosolids Program Manager	<ul style="list-style-type: none"> – Supervise operation of biosolids treatment facility and lagoons – Control budget for area and procure material and services as needed to ensure efficient operation – Ensure due diligence in daily activities and compliance with regulatory requirements – Ensure staff follow safe work practices as outlined in Health and Safety procedures; provide PPE and training as needed – Participate in Public relations, evaluate investigations and preparing reports – Respond to emergencies and complaints 	<ul style="list-style-type: none"> – Perform listed responsibilities – Approve purchases in accordance with approved budget and policies and procedures – Discipline and deal with minor personnel matters – Suggest continual improvements – Delegate
Biosolids Residual Solids Operator	<ul style="list-style-type: none"> – Perform operational functions – Maintain written and computer based daily records – Prepare work orders for repairs to equipment – Collect and test process samples to monitor/maintain relevant parameters 	<ul style="list-style-type: none"> – Perform listed responsibilities – Suggest continual improvements

Position/Group	Responsibilities	Authorities
Support Staff	<ul style="list-style-type: none"> – Maintain appropriate control of documents and records – Assist with communications, Public relations, investigations and preparing reports as needed by Operations – Clerical functions – Assist with Customer Service activities including responding to complaints 	<ul style="list-style-type: none"> – Perform listed responsibilities – Suggest continual improvements
Manager of Quality and Compliance, Wastewater	<ul style="list-style-type: none"> – Ensure processes are optimized and maintained – Develop and implement quality sampling program as required in a collection system – Ensure staff follow safe work practices as outlined in Health and Safety procedures; provide PPE and training as needed – Administer environmental enforcement program 	<ul style="list-style-type: none"> – Perform listed responsibilities – Suggest continual improvements – Discipline and deal with minor personnel matters – Issue notice of non-compliance – Delegate
W&WW Quality Management Specialist (Alternate QMS Rep) (Directly Affects Drinking Water)	<ul style="list-style-type: none"> – See QMS Representative Responsibilities in Operational Plan (Section 4) 	<ul style="list-style-type: none"> – Perform listed responsibilities – Suggest continual improvements
Environmental Laboratory Supervisor	<ul style="list-style-type: none"> – Supervise Environmental Laboratory Staff – Control budget for area and procure material and services as needed to ensure efficient operation – Ensure due diligence in daily activities and compliance with regulatory requirements – Ensure staff follow safe work practices as outlined in Health and Safety procedures; provide PPE and training as needed 	<ul style="list-style-type: none"> – Perform listed responsibilities – Suggest continual improvements – Discipline and deal with minor personnel matters – Delegate

Position/Group	Responsibilities	Authorities
Environmental Laboratory Staff	<ul style="list-style-type: none"> – Conduct analytical wastewater and biosolids testing – Follow established protocols for sampling and testing – Provide notification if there is an exceedance 	<ul style="list-style-type: none"> – Perform listed responsibilities – Suggest continual improvements
Environmental Enforcement Staff	<ul style="list-style-type: none"> – Determine sampling locations and methods, and collect water or wastewater samples for analysis – Inspect wastewater treatment, and disposal facilities and systems for compliance to federal, provincial, or local regulations (including Environmental Compliance Approvals) – Examine permits, licences, applications, and records to ensure compliance with licencing requirements – Prepare, organize, and maintain inspection records – Monitor follow-up actions in instances where violations were found, and review compliance monitoring reports. – Execute relief operational duties 	<ul style="list-style-type: none"> – Perform listed responsibilities – Suggest continual improvements – Recommend notice of non-compliance
Process & Compliance Staff, Wastewater	<ul style="list-style-type: none"> – Process optimization – Technical support – Compliance support – Sampling program development assistance – Benchmarking – Maintain appropriate control of documents and records 	<ul style="list-style-type: none"> – Perform listed responsibilities – Suggest continual improvements

10. Competencies

Niagara Region personnel performing duties directly affecting drinking water must understand the importance of their actions. Furthermore, they must be competent in their jobs and have appropriate education, training, skills and/or experience.

The [Competencies Table \(QMS-ALL-ALL-T-100\)](#) documents competencies required for personnel performing duties directly affecting drinking water quality.

[Competencies \(QMS-WT-ALL-P-100\)](#) documents activities to develop and maintain the required competencies for personnel performing duties directly affecting drinking water quality. The Competencies Procedure also documents activities to ensure that all Operating Authority personnel are aware of the relevance of their duties.

Both the procedure and table are available on Vine.

11. Personnel Coverage

Niagara Region ensures that sufficient personnel meeting identified competencies are available for duties that directly affect drinking water quality as documented in [Personnel Coverage \(QMS-WT-ALL-P-110\)](#).

[Personnel Coverage \(QMS-WT-ALL-P-110\)](#) is available on Vine.

12. Communications

Effective communication is essential for ensuring a successful QMS. [Communications \(QMS-WT-ALL-P-120\)](#) describes how relevant aspects of the QMS are communicated between Top Management and the Owner, Operating Authority personnel, Suppliers and the Public.

[Communications \(QMS-WT-ALL-P-120\)](#) is available on Vine.

13. Essential Supplies and Services

Niagara Region's drinking water systems require a number of essential supplies and services for the production of safe drinking water. These supplies and services are categorized as:

- Chemical supplies
- Calibration services
- Laboratory services
- Miscellaneous supplies/services

A general overview of essential supplies and services, methods to ensure their procurement, and procedures for quality assurance is provided in [Essential Supplies and Services \(QMS-WT-ALL-P-130\)](#); the procedure is available on Vine.

Essential supplies and services for both water and wastewater are identified on the ["Essential Supplies and Services" Vine page](#). The table can be filtered to show only those supplies and services used in respect of Niagara Region's drinking water systems.

NOTE: Only drinking water system supplies and services fall within the scope of this Operational Plan.

14. Review, Rehabilitation and Renewal of Infrastructure

[Review, Rehabilitation, and Renewal of Infrastructure \(QMS-WT-ALL-P-140\)](#) describes how Niagara Region reviews the adequacy of infrastructure necessary to operate and maintain its drinking water systems. It also details how infrastructure rehabilitation and renewal projects that are funded from the capital budget are initiated, approved and communicated to the Owner.

[Review, Rehabilitation, and Renewal of Infrastructure \(QMS-WT-ALL-P-140\)](#) is available on Vine.

15. Infrastructure Maintenance

Niagara Region maintains an effective maintenance program. The maintenance program includes planned and unplanned **infrastructure** maintenance, renewal, and rehabilitation **activities that are** typically funded from the current budget. [Maintenance \(QMS-WT-ALL-P-150\)](#) describes the maintenance program, long-term maintenance, rehabilitation, and renewal plans, the means to monitor maintenance effectiveness, and how maintenance programs are communicated to the Owner.

[Maintenance \(QMS-WT-ALL-P-150\)](#) is available on Vine.

16. Sampling, Testing and Monitoring

Sampling, testing and monitoring activities are essential to confirm water quality and to be compliant with legislation and regulations. [Sampling, Testing and Monitoring \(QMS-WT-ALL-P-160\)](#) describes these activities and how results are recorded and shared.

To complement the procedure, the following tables outline the sampling, testing, and monitoring activities undertaken at each WTP:

- [Sampling, Testing & Monitoring Activities – DeCew Falls WTP \(QMS-WT-DF-T-160\)](#)
- [Sampling, Testing & Monitoring Activities – Grimsby WTP \(QMS-WT-DF-T-160\)](#)
- [Sampling, Testing & Monitoring Activities – Niagara Falls WTP \(QMS-WT-DF-T-160\)](#)
- [Sampling, Testing & Monitoring Activities – Port Colborne WTP \(QMS-WT-DF-T-160\)](#)
- [Sampling, Testing & Monitoring Activities – Rosehill WTP \(QMS-WT-DF-T-160\)](#)
- [Sampling, Testing & Monitoring Activities – Welland WTP \(QMS-WT-DF-T-160\)](#)

All of the above documents are available on Vine.

17. Measurement & Recording Equipment Calibration & Maintenance

The measurement and recording equipment used in Niagara Region's drinking water systems is calibrated and maintained according to [Measurement and Recording Equipment Calibration and Maintenance \(QMS-WT-ALL-P-170\)](#).

[Measurement and Recording Equipment Calibration and Maintenance \(QMS-WT-ALL-P-170\)](#) is available on Vine.

18. Emergency Management

Emergency preparedness is achieved by following Niagara Region's Emergency Response Procedures (ERP) Manual for Water and Wastewater Systems. The ERP Manual includes response and recovery procedures for potential emergencies that could impact drinking water quality. Each procedure is laid out step by step and clearly notes responsibilities of those involved. Training and testing requirements are specified in [Water and Wastewater Emergency Response Plan \(ERP-ALL-ALL-P-001\)](#). An [Emergency Response Contact List \(ERP-ALL-ALL-T-002\)](#) is also included as part of the ERP Manual.

The ERP Manual is available on the Vine's [Water-Wastewater Services Division Page](#) under "W-WW Emergency Response Plan".

19. Internal Audits

Internal audits add value to Niagara Region's operations by providing feedback about the QMS and its effectiveness. [Internal Auditing \(QMS-WT-ALL-P-190\)](#) describes:

- How to evaluate the conformity of Niagara Region's QMS with the requirements of the Standard;
- Audit criteria, frequency, scope, methodology and record keeping requirements;
- How previous internal and external audit results are considered; and
- How corrective actions are identified and initiated (see Section 21 of this Operational Plan).

[Internal Auditing \(QMS-WT-ALL-P-190\)](#) is available on Vine.

20. Management Review

Management Reviews are performed to ensure the continuing suitability, adequacy and effectiveness of the QMS. [Management Review \(QMS-WT-ALL-P-200\)](#) documents the process followed in undertaking the review.

[Management Review \(QMS-WT-ALL-P-200\)](#) is available on Vine.

21. Continual Improvement

Niagara Region maintains and continually improves its Water QMS through annual audits, management reviews, implementation of best management practices, process optimization, and staff development, and measures the effectiveness of these continual improvement initiatives.

Through the internal audit process, corrective actions and preventive actions/opportunities for improvement are identified and reported in order to detect and eliminate non-conformances.

[Corrective Action, Preventive Action, and Best Practices \(QMS-WT-ALL-P-210\)](#) outlines the Operating Authority's corrective and preventive action processes.

Deficiencies identified as part of the management review are discussed and action plans are created to improve the QMS.

Niagara Region reviews and considers best practices from a multitude of sources, including but not limited to the Ministry's published list, regulatory inspections, benchmarking activities, and networking with peers. Implemented best practices are tracked as preventive actions/opportunities for improvement.

Niagara Region staff efforts are critical for continual improvement of the QMS. We are committed to providing effective staff development opportunities (i.e. courses, workshops, on the job training) in an effort to continually improve our operations.

[Corrective Action, Preventive Action, and Best Practices \(QMS-WT-ALL-P-210\)](#) is available on Vine.

DRAFT

Table of Revisions:

Revision	Date	Description of Revision	Updated By
0	Oct. 29, 2008	Operational Plan created	Heather Sim
1	Oct. 5, 2009	Administrative revisions include: (i) the addition of new Associate Director positions for Water and Wastewater Operations, and the removal of the Manager, Water Operations, following Organizational change; (ii) the addition of Support Staff to each area; (iii) the addition of Manager of Quality & Compliance, Process & Development Staff and Water Support Staff to the “directly impacting water quality” group; (iv) the revision of procedure numbers following revision to the Document Naming Convention Procedure; and (v) the addition of the Table of Revisions.	Jocelyn Koteles (Authorized by Commissioner of Public Works, Ken Brothers)
<i>Entered into EtQ – October 27, 2011</i>			
2	Sep. 24, 2012	Revised procedure to include: (i) updated links to relevant documents; (ii) administrative changes to positions/titles and added the Contract Administrator/Security Coordinator to the table of positions affecting the quality of drinking water (CAR#00019); (iii) identification of the Coordinator W&WW Quality Management as the QMS Representative; (iv) removed individual risk assessment outcome records and added reference to the risk assessment outcome table (QMS-WT-ALL-080-F1) and the respective CCP response procedures; (v) Removed “ <i>The Drinking-Water System Risk Outcomes Summary is available on Sherpa</i> ” from section 8.0 Risk Assessment Outcomes	Jen Croswell
3	Jan. 2, 2013	Revised procedure to include: (i) Table 3: Responsibilities and Authorities, will include “directly affects drinking water” under titles/groups which are listed in Figure 1: Water and Wastewater Services Division Organizational Chart as directly affecting the drinking water; (ii) Figure 1: Water and Wastewater Services Division Organizational Chart will be revised to include a blue box, in addition to the red box, around the Associate Director, Water Operations to indicate that the position directly affects drinking water and a member of Top Management; (iii) To provide clarity for external audiences, the Operational Plan, Table 3: Responsibilities and Authorities will be revised to include a list of maintenance staff group categories under the Title/Group column. The above revisions were made in response to external CARs J0322584-3 and J0322584-5. Additional revisions include: (i) An update to the current mission statement; (ii) updated the document ID for the Risk Assessment Outcomes Table, from QMS-WT-ALL-080-F1 to QMS-WT-ALL-081, to reflect that the Risk Assessment Outcomes Table is a living document and not a form.	Jen Croswell

Revision	Date	Description of Revision	Updated By
4	Apr. 22, 2014	Administrative revisions include: (i) the addition of the Approval, License and Amendment Procedure (QMS-ALL-ALL-021) and Ministry of Environment Inspection Document Request Procedure (QMS-WT-ALL-022) to section 2, Quality Management System Policy; (ii) the addition of Tracking Critical Control Limit (CCL) Deviations (OP-WT-ALL-807) to section 8, Risk Assessment Outcomes; (iii) the removal of Integrated Solutions Support Manager and the revisions of Process & Development Staff to Quality & Compliance Staff to section 9, Organizational Structure, Roles, Responsibilities and Authorities; (iv) revisions to Table 1: Niagara Region's Drinking-Water Systems in section 6, Drinking-Water Systems; (v) identification of a backup QMS Representative to section 4, QMs Representative; and (vi) Minor administrative edits throughout.	Jen Croswell
5	Jun. 29, 2015	Operational Plan endorsed by the System Owner and Top Management – Signature sheet to be added to document endorsement, no further revisions.	Jen Croswell
6	Jan. 7, 2016	Revisions to: <ul style="list-style-type: none"> Section 2 – updated QMS Policy poster graphic (Mar 31, 2015 Rev 1) Section 3 – revised how written records of commitment and endorsement are obtained and updated Section 9 – added the Associate Director Engineering to Top Management (OFI 2015-002-Internal); expanded Engineering and Wastewater Operations staff to reflect positions in the Wastewater Operational Plan; added Supervisory Development Program position; included additional responsibilities in regards to “scoping, design and construction of projects” maintenance manager positions (OFI-14-02) Minor administrative revisions throughout 	Jen Croswell
7	Oct. 31, 2016	<ul style="list-style-type: none"> Identified Engineering staff (Senior Project Managers and Project Managers) as staff whose work directly affects drinking water quality. Revised organizational structure and position titles to reflect reorganization of W-WW Services Division and results of the Corporate Job Evaluation Process. Updated procedure links Updated document IDs in accordance with revised document numbering conventions 	Rachel Whyte

Revision	Date	Description of Revision	Updated By
8	Aug. 24, 2018	<ul style="list-style-type: none"> Changed “Sherpa” to “Vine” to reflect implementation of new Regional intranet. Removed reference to controlled document “Essential Supplies and Services Table (QMS-WT-ALL-T-130)” and included reference to “Essential Supplies and Services” Vine page. Removed references to Regulatory Updates (ADM-WT-ALL-P-003), Drinking Water System Licence and Permit Amendments (ADM-WT-ALL-P-004), and MOECC Inspection Document Requests (ADM-WT-ALL-P-005). These procedures align with the MECP inspection process and are not considered to fall directly within the scope of the Drinking Water Quality Management System. Operational Plan. Updated list of drinking water facilities in Table 1 (page 7). Added discussion of best practice review and preventive actions as forms of continual improvement, and noted that effectiveness of continual improvement initiatives is measured. Changed staff title from Manager, Infrastructure Planning & Asset Management to Manager, Capital Planning (as per Divisional memo, 4Dec2017). Updated procedure hyperlinks as required. 	Rachel Whyte
9	Mar. 28, 2019	<ul style="list-style-type: none"> Updated to align with requirements of <i>Drinking Water Quality Management Standard</i>, v.2.0 (February 2017). <i>Operational Plan endorsed by 2018-2022 term of Regional Council.</i> 	Rachel Whyte
10	Dec. 12, 2019	<ul style="list-style-type: none"> Specified that W-WW QM Specialist reporting to Manager, Q&C – Water is the QMS Rep for the DWQMS; W-WW QM Specialist reporting to Manager, Q&C – Wastewater is the alternate/backup Removed Crescent Park Elevated Tank from Rosehill DWS and King Street Elevated Tank from Port Colborne DWS (both have been decommissioned) Updated organizational chart and roles & responsibilities table following divisional restructuring Added AD Asset Management and W-WW Quality Management Specialist (Wastewater) roles and responsibilities Defined “Ministry” as Ministry of the Environment, Conservation, and Parks. <i>Operational Plan endorsed by 2018-2022 term of Regional Council.</i>	Rachel Whyte

The Regional Municipality of Niagara

Wastewater Quality Management System Operational Plan

For the:

Anger Avenue Wastewater System
Baker Road Wastewater System
Crystal Beach Wastewater System
Niagara Falls Wastewater System
Niagara-on-the-Lake Wastewater System
Port Dalhousie Wastewater System
Port Weller Wastewater System
Queenston Wastewater System
Seaway Wastewater System
Welland Wastewater System
Stevensville/Douglastown Lagoon Wastewater System
Garner Road Biosolids Handling and Dewatering Facility

Effective Date: December 12, 2019

Revision Number: 3



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Appendix 2 Wastewater System Descriptions:

- [Anger Avenue Wastewater System Description \(QMS-WW-FE-P-060\)](#)
- [Baker Road Wastewater System Description \(QMS-WW-BR-P-060\)](#)
- [Crystal Beach Wastewater System Description \(QMS-WW-CB-P-060\)](#)
- [Garner Road Biosolids Handling and Dewatering Facility System Description \(QMS-WW-GR-P-060\)](#)
- [Niagara Falls Wastewater System Description \(QMS-WW-NF-P-060\)](#)
- [Niagara-on-the-Lake Wastewater System Description \(QMS-WW-NL-P-060\)](#)
- [Port Dalhousie Wastewater System Description \(QMS-WW-PD-P-060\)](#)
- [Port Weller Wastewater System Description \(QMS-WW-PW-P-060\)](#)
- [Queenston Wastewater System Description \(QMS-WW-QT-P-060\)](#)
- [Stevensville-Douglastown Lagoon Wastewater System Description \(QMS-WW-SD-P-060\)](#)
- [Seaway Wastewater System Description \(QMS-WW-SW-P-060\)](#)
- [Welland Wastewater System Description \(QMS-WW-WE-P-060\)](#)

Appendix 3 Wastewater System Process Schematics:

- [Anger Avenue WWTP Process Schematic \(QMS-WW-FE-V-060\)](#)
- [Baker Road WWTP Process Schematic \(QMS-WW-BR-V-060\)](#)
- [Crystal Beach WWTP Process Schematic \(QMS-WW-CB-V-060\)](#)
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- [Queenston WWTP Process Schematic \(QMS-WW-QT-V-060\)](#)
- [Stevensville/Douglstown Lagoon Process Schematic \(QMS-WW-SD-V-060\)](#)
- [Seaway WWTP Process Schematic \(QMS-WW-SW-V-060\)](#)
- [Welland WWTP Process Schematic \(QMS-WW-WE-V-060\)](#)

Appendix 4

Wastewater System Process Schematics:

- [Anger Avenue WWTP System Schematic \(QMS-WW-FE-V-061\)](#)
- [Baker Road WWTP System Schematic \(QMS-WW-BR-V-061\)](#)
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Appendix 5

[Wastewater System Risk Assessment \(QMS-WW-ALL-P-070\)](#)

Appendix 6

Risk Assessment Outcomes Table (CONFIDENTIAL)

Appendix 7

Competencies

- [Competencies \(QMS-WW-ALL-P-100\)](#)
- [Competencies Table \(QMS-ALL-ALL-T-100\)](#)

Appendix 8

[Personnel Coverage \(QMS-WW-ALL-P-110\)](#)

Appendix 9

[Communications \(QMS-WW-ALL-P-120\)](#)

Appendix 10

Essential Supplies and Services

- [Essential Supplies and Services \(QMS-WW-ALL-P-130\)](#)
- [“Essential Supplies and Services” Vine page](#)

Appendix 11

[Review, Rehabilitation and Renewal of Infrastructure \(QMS-WW-ALL-P-140\)](#)

Appendix 12

[Maintenance \(QMS-WW-ALL-P-150\)](#)

Appendix 13

[Sampling, Testing and Monitoring \(QMS-WW-ALL-P-160\)](#)

Appendix 14	<u>Measurement and Recording Equipment Calibration and Maintenance (QMS-WW-ALL-P-170)</u>
Appendix 15	Water-Wastewater Emergency Response Plan Manual (CONFIDENTIAL)
Appendix 16	<u>Internal Auditing (QMS-WW-ALL-P-190)</u>
Appendix 17	<u>Management Review (QMS-WW-ALL-P-200)</u>
Appendix 18	<u>Corrective Action (QMS-WW-ALL-P-210)</u>

DRAFT

1. Introduction

1.1 Drinking Water Quality Management Standard

The Drinking Water Quality Management Standard (DWQMS) focuses on a proactive and preventive approach for the management of drinking water quality using the four-step “PLAN–DO–CHECK–IMPROVE” process. Under the DWQMS, all municipal residential drinking water systems are required to develop and implement a quality management system (QMS) that must be documented in an operational plan. DWQMS requirements were used as a foundation for the development of Niagara Region’s Wastewater Quality Management System.

Unlike Niagara Region’s Water QMS, the Wastewater QMS is not a legislated requirement; rather, it has been developed and implemented as a best practice. The establishment of a Wastewater QMS demonstrates Niagara Region’s due diligence and proactive approach to quality management in wastewater services.

1.2 Niagara Region

The Regional Municipality of Niagara (“Niagara Region”) owns and operates twelve wastewater systems, including:

- **Nine** wastewater treatment plants (WWTPs), **a wastewater treatment lagoon, and a combined lagoon/WWTP system.** These systems collect and treat wastewater from eleven area municipalities: the Cities of St. Catharines, Niagara Falls, Welland, and Port Colborne; the Towns of Grimsby, Lincoln, Thorold, Pelham, Fort Erie, and Niagara-on-the-Lake; and the Township of West Lincoln. Each of these area municipalities owns and operates collection systems that collect wastewater from customers within the region.
- A biosolids handling and dewatering facility (“Garner Road”); dewatering processes at this facility are operated by Niagara Region staff, while biosolids handling is executed by a third-party contractor.

Niagara Region is committed to source water protection by effectively collecting and treating wastewater, and has implemented a QMS in support of its wastewater systems.

1.3 Scope

This Operational Plan documents the QMS for Niagara Region's twelve wastewater systems:

- Anger Avenue Wastewater System
- Baker Road Wastewater System
- Crystal Beach Wastewater System
- Niagara Falls Wastewater System
- Port Dalhousie Wastewater System
- Port Weller Wastewater System
- Queenston Wastewater System
- Seaway Wastewater System
- Welland Wastewater System
- Niagara-on-the-Lake Wastewater System (Lagoon and WWTP)
- Stevensville/Douglastown Lagoon Wastewater System
- Garner Road Biosolids Handling and Dewatering Facility Wastewater System

For the purpose of this Operational Plan and associated procedures:

- **All Staff** includes all staff employed by Niagara Region
- **All Operating Authority Staff** includes all staff within the Water and Wastewater Services Division except those who only work in water systems (i.e. Water Operators, Managers, and assigned Maintenance staff)
- **Staff who directly affect wastewater treatment quality** include:
 - Wastewater Operations Managers and Supervisor(s)
 - Wastewater Operators and Operators-in-Training
- **Staff who affect wastewater treatment quality** include:
 - Associate Director, Wastewater Operations, Maintenance, and Laboratory Services

- Wastewater Operations Clerks
 - System Maintenance Managers & Supervisors (Wastewater)
 - System Maintenance Staff (Wastewater)
 - Manager of Wastewater Quality & Compliance
 - Wastewater Quality & Compliance Staff (including Water-Wastewater Quality Management Specialist, Laboratory, and Environmental Enforcement Staff)
 - Biosolids Manager
 - Biosolids – Residual Solids Operators
 - Supervisor, W&WW Development Program
 - Associate Director, Engineering
 - Senior Project Managers & Project Managers
 - Engineering Support Staff
 - Associate Director, Integrated Systems
 - Manager of Technical Trades (SCADA)
 - Technical Trades Staff
 - Managers of Skilled Trades (Electrical and Instrumentation)
 - Skilled Trades Staff
 - Water-Wastewater Safety Advisor
 - Water-Wastewater Training Advisor
 - Associate Director, Asset Management
 - Manager, Water-Wastewater Capital Planning Program
 - Supervisor, Water-Wastewater Maintenance Management
 - Maintenance Support Staff
 - Asset Information Supervisor
 - Asset Information Staff
 - Asset Performance Management Supervisor
 - Asset Performance Management Staff
- **Ministry** refers to the Ministry of the Environment, Conservation, and Parks.

2. Quality Management System Policy

Niagara Region is committed to the effective treatment of wastewater within the region. Our Wastewater QMS Policy is shown below.

Figure 1: Wastewater Quality Management System Policy¹



¹ March 31, 2015 – Revision 1

3. Commitment and Endorsement

3.1 Top Management

Each member of Top Management pledges commitment to the Wastewater QMS and endorses the Operational Plan through the signing of a Commitment and Endorsement Memorandum. The Memorandum includes a pledge to ensure the implementation, maintenance and continual improvement of the QMS for each of Niagara Region's wastewater systems as documented in this Operational Plan.

3.2 Owner

As System Owner, Niagara Region ensures the implementation, maintenance and continual improvement of the QMS for each of its wastewater systems, as documented in this Operational Plan.

By signing below, Regional Council (represented by the Regional Chair and Clerk) endorse the contents of this Operational Plan.

The Regional Municipality of Niagara

Per:

Regional Chair
Jim Bradley

Date

Regional Clerk
Ann-Marie Norio

Date

3.3 Continued Endorsement

When changes in Top Management occur, the QMS Representative ensures that a Commitment and Endorsement Memorandum is signed by any new members of Top Management. Top Management receives QMS updates as per [Management Review \(QMS-WW-ALL-P-200\)](#).

The System Owner receives updates as per [Communications \(QMS-WW-ALL-P-120\)](#). Continued endorsement of the Operational Plan is demonstrated through the enactment of a confirmatory by-law preceding each Council meeting. The QMS Representative ensures that Council endorsement is received for the most current Operational Plan following changes in Council due to election.

4. QMS Representative

Top Management has appointed the Water-Wastewater Quality Management Specialist (reporting to the Manager, Quality & Compliance – Wastewater) as the QMS Representative for Niagara Region's drinking water systems. In the event that the Water-Wastewater Quality Management Specialist is unable to fulfil the duties of QMS Representative, the Water-Wastewater Quality Management Specialist (reporting to the Manager, Quality & Compliance – Water) will assume the role and responsibilities.

The QMS Representative's responsibilities include, but are not limited to:

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

5. Document and Records Control

Document and records control is an essential part of the QMS. [Document and Records Control \(QMS-WW-ALL-P-050\)](#) outlines how documents required by the QMS are kept current, legible, readily identifiable, retrievable, stored, protected, retained and disposed of. The procedure also documents how records required by the QMS are kept legible, readily identifiable, retrievable, stored, protected, retained, and disposed of.

[Document and Records Control \(QMS-WW-ALL-P-050\)](#) is available via the Regional intranet.

6. Wastewater Systems

6.1 *Description of Overall Wastewater Systems*

Niagara Region owns and operates twelve wastewater systems, including wastewater treatment plants (WWTPs), collection systems, lagoons, associated pump stations, and a biosolids handling and dewatering facility. Niagara Region collects wastewater from eleven area municipalities.

Table 1 lists the facilities associated with each of Niagara's wastewater systems, as well as the local municipal collection systems that contribute to the subject system's influent.

Wastewater system descriptions are available via the Regional intranet (see links in Table 1).

Table 1: Niagara Region's Wastewater Systems

Wastewater System	Wastewater System Facilities	Municipal Collection Systems
Anger Avenue (FE) – Anger Avenue Wastewater System Description (QMS-WW-FE-P-060)	Alliston St. Sewage Pumping Station (SPS) Bardol Ave. SPS Catharine St. SPS Dominion Rd. SPS Lakeshore Rd. SPS Rose Ave. SPS Rosehill WTP Backwash PS Thompson Rd. SPS	Fort Erie
Baker Road (BR) – Baker Road Wastewater System Description (QMS-WW-BR-P-060)	Bal Harbour SPS Biggar Lagoon SPS Bridgeport SPS Campden SPS Jordan Valley SPS Lake St. SPS Lakewood Garden SPS Laurie Ave. SPS Old Orchard SPS Ontario St. SPS Roberts Rd. SPS Smithville SPS Streamside SPS Victoria Ave. SPS Woodsvie SPS	Grimsby Lincoln West Lincoln
Crystal Beach (CB) – Crystal Beach Wastewater System Description (QMS-WW-CB-P-060)	Erie Rd. SPS Nigh Rd. SPS Shirley Rd. SPS	Fort Erie (Crystal Beach and Ridgeway)

Wastewater System	Wastewater System Facilities	Municipal Collection Systems
Garner Road (GR) – Garner Road Biosolids Handling and Dewatering Facility System Description (QMS-WW-GR-P-060)	Garner Road Biosolids Handling and Dewatering Facility	Digested sludge from all WWTPs Water residuals from Decew WTP and Grimsby WTP
Niagara Falls (NF) – Niagara Falls Wastewater System Description (QMS-WW-NF-P-060)	Bender Hill SPS Calaguire Estates SPS Central SPS/HRT Creek Rd. SPS Dorchester Rd. SPS Drummond Rd. SPS Garner Rd. Biosolids Storage Facility PS Garner Rd. SW SPS Grassy Brook SPS Kalar Rd. SPS Lundy's Lane SPS Meadowvale SPS Mewburn Rd. SPS (<i>City-owned</i>) Muddy Run SPS Niagara Falls WWTP Neighbourhood of St. David's SPS Oakwood Dr. SPS Rolling Acres SPS Royal Manor SPS Seneca St. SPS South Side High Lift SPS South Side Low Lift SPS Stanley/McLeod Storm Water PS Townline SPS	Niagara Falls Niagara-on-the-Lake (<i>St. Davids</i>)

Wastewater System	Wastewater System Facilities	Municipal Collection Systems
Niagara-on-the-Lake (NL) – Niagara-on-the-Lake Wastewater System Description (QMS-WW-NL-P-060)	Front Street SPS Garrison Village SPS Lakeshore Road SPS Line 2 (Hunter Farm) SPS Niagara Stone Road SPS Niagara-on-the-Lake WWTP/Lagoon Ricardo Street SPS William Street Sewage Detention Facility William Street SPS	Niagara-on-the-Lake
Port Dalhousie (PD) – Port Dalhousie Wastewater System Description (QMS-WW-PD-P-060)	Argyle SPS Beaverdams SPS Cole Farm SPS Confederation Heights SPS Eastchester SPS Glendale SPS Lakeside SPS Lighthouse Rd. SPS October Village SPS Port Dalhousie WWTP Renown SPS Riverview SPS St. George's SPS Snug Harbour SPS Wellandvale SPS	St. Catharines Thorold

Wastewater System	Wastewater System Facilities	Municipal Collection Systems
Port Weller (PW) – Port Weller Wastewater System Description (QMS-WW-PW-P-060)	Airport Rd. SPS Black Horse SPS Carleton St. SPS Centre St. SPS Haulage Rd SPS Lombardy Ave. SPS Peel St. SPS Port Weller WWTP Spring Garden SPS Thorold Tunnel SPS	St. Catharines Thorold
Queenston (QT) – Queenston Wastewater System Description (QMS-WW-QT-P-060)	Queenston WWTP	Niagara-on-the-Lake (Queenston)
Stevensville-Douglastown Lagoon (SD) – Stevensville-Douglastown Lagoon Wastewater System Description (QMS-WW-SD-P-060)	Black Creek Flow Meter Douglastown SPS Stevensville SPS Stevensville/Douglastown Lagoon	Fort Erie (Stevensville-Douglastown)
Seaway (SW) – Seaway Wastewater System Description (QMS-WW-SW-P-060)	Arena St. SPS City Hall SPS Clark St. SPS Eastside SPS Elm St. S. SPS Fares St. SPS Fretz SPS Industrial Park SPS Main St. SPS Marina 1 SPS Marina 2 SPS	Port Colborne

Wastewater System	Wastewater System Facilities	Municipal Collection Systems
Seaway (SW) – Seaway Wastewater System Description (QMS-WW-SW-P-060) <i>(continued)</i>	Marina 3 SPS Nickel St. SPS Omer Ave. SPS Oxford Rd. SPS Rosemount N. SPS Rosemount S. SPS Seaway WWTP Steele Rd. SPS Sugarloaf SPS Union St. SPS	
Welland (WE) – Welland Wastewater System Description (QMS-WW-WE-P-060)	Daimler Wood SPS Dain City SPS Feeder Rd. SPS Foss Rd. SPS Fitch St. SPS <i>(City-owned)</i> George St. SPS Hurricane Rd. SPS Kelly St. SPS Lyons Creek CSO OAW Sanitary Sewer Ontario Rd. SPS Park Lane SPS Rice Rd Partial Flume Seaway Heights SPS South Pelham Partial Flume South St. SPS South Thorold (Towpath) SPS Timmsdale SPS Welland WWTP	Welland Pelham Thorold South

6.2 Process Schematics and System Schematics

Process schematics for each of Niagara Region’s wastewater treatment systems are available via the Regional intranet as follows:

- Anger Avenue WWTP Process Schematic ([QMS-WW-FE-V-060](#))
- Baker Road WWTP Process Schematic ([QMS-WW-BR-V-060](#))
- Crystal Beach WWTP Process Schematic ([QMS-WW-CB-V-060](#))
- Garner Road Biosolids Facility Process Schematic ([QMS-WW-GR-V-060](#))
- Niagara Falls WWTP Process Schematic ([QMS-WW-NF-V-060](#))
- Niagara-on-the-Lake WWTP Process Schematic ([QMS-WW-NL-V-060](#))
- Port Dalhousie WWTP Process Schematic ([QMS-WW-PD-V-060](#))
- Port Weller WWTP Process Schematic ([QMS-WW-PW-V-060](#))
- Queenston WWTP Process Schematic ([QMS-WW-QT-V-060](#))
- Stevensville/Douglastown Lagoon Process Schematic ([QMS-WW-SD-V-060](#))
- Seaway WWTP Process Schematic ([QMS-WW-SW-V-060](#))
- Welland WWTP Process Schematic ([QMS-WW-WE-V-060](#))

6.3 System Schematics

Schematics for each of Niagara Region's wastewater collection systems are available via the Regional intranet as follows:

- Anger Avenue WWTP System Schematic ([QMS-WW-FE-V-061](#))
- Baker Road WWTP System Schematic ([QMS-WW-BR-V-061](#))
- Crystal Beach WWTP System Schematic ([QMS-WW-CB-V-061](#))
- Niagara Falls WWTP System Schematic ([QMS-WW-NF-V-061](#))
- Niagara-on-the-Lake WWTP System Schematic ([QMS-WW-NL-V-061](#))
- Port Dalhousie WWTP System Schematic ([QMS-WW-PD-V-061](#))
- Port Weller WWTP System Schematic ([QMS-WW-PW-V-061](#))
- Queenston WWTP System Schematic ([QMS-WW-QT-V-061](#))
- Stevensville/Douglastown Lagoon System Schematic ([QMS-WW-SD-V-061](#))
- Seaway WWTP System Schematic ([QMS-WW-SW-V-061](#))
- Welland WWTP System Schematic ([QMS-WW-WE-V-061](#))

6.4 General Characteristics of Influent

Influent to Niagara Region's wastewater systems is comprised of industrial and residential wastewater. General characteristics of each of Niagara Region's wastewater systems are documented within individual Wastewater System Descriptions (see Table 1, page 8).

6.5 Common Event-Driven Fluctuations, Operational Challenges & Threats

Event-driven fluctuations and resulting operational challenges and threats impacting Niagara Region's wastewater systems are documented within individual Wastewater System Descriptions (see Table 1, page 8).

6.6 Critical Upstream & Downstream Processes

Local area municipalities own and operate collection systems upstream of each of Niagara Region's wastewater systems (as listed in Table 1).

Niagara Region actively participates in source protection initiatives to protect source water for municipal drinking water systems.

7. Risk Assessment

A risk assessment procedure has been developed and implemented that:

- Identifies potential hazardous events and associated hazards,
- Assesses the risks associated with the occurrence of hazardous events,
- Ranks the hazardous events according to their level of risk,
- Identifies mitigating measures,
- Identifies a method to verify currency of information,
- Ensures a risk assessment is conducted at least once every three years, and
- Considers the reliability and redundancy of equipment.

[Wastewater System Risk Assessment \(QMS-WW-ALL-P-070\)](#) is available via the Regional intranet.

8. Risk Assessment Outcomes

Risk assessment outcomes include identification of hazardous events, associated risk scoring, mitigating measures, and response procedures.

9. Organizational Structure, Roles, Responsibilities and Authorities

Water and Wastewater Services is a division of Niagara Region's Public Works Department and serves as the Operating Authority for the Region's wastewater systems and their associated facilities (refer to Section 1.3).

- Our Mission Statement: Through dedicated teamwork and commitment, provide high-quality, safe, and reliable water and wastewater services while practicing good stewardship of resources to benefit present and future generations.
- Our Role: To deliver clean, safe drinking water to the municipal water distribution network and to provide effective wastewater treatment for the community.

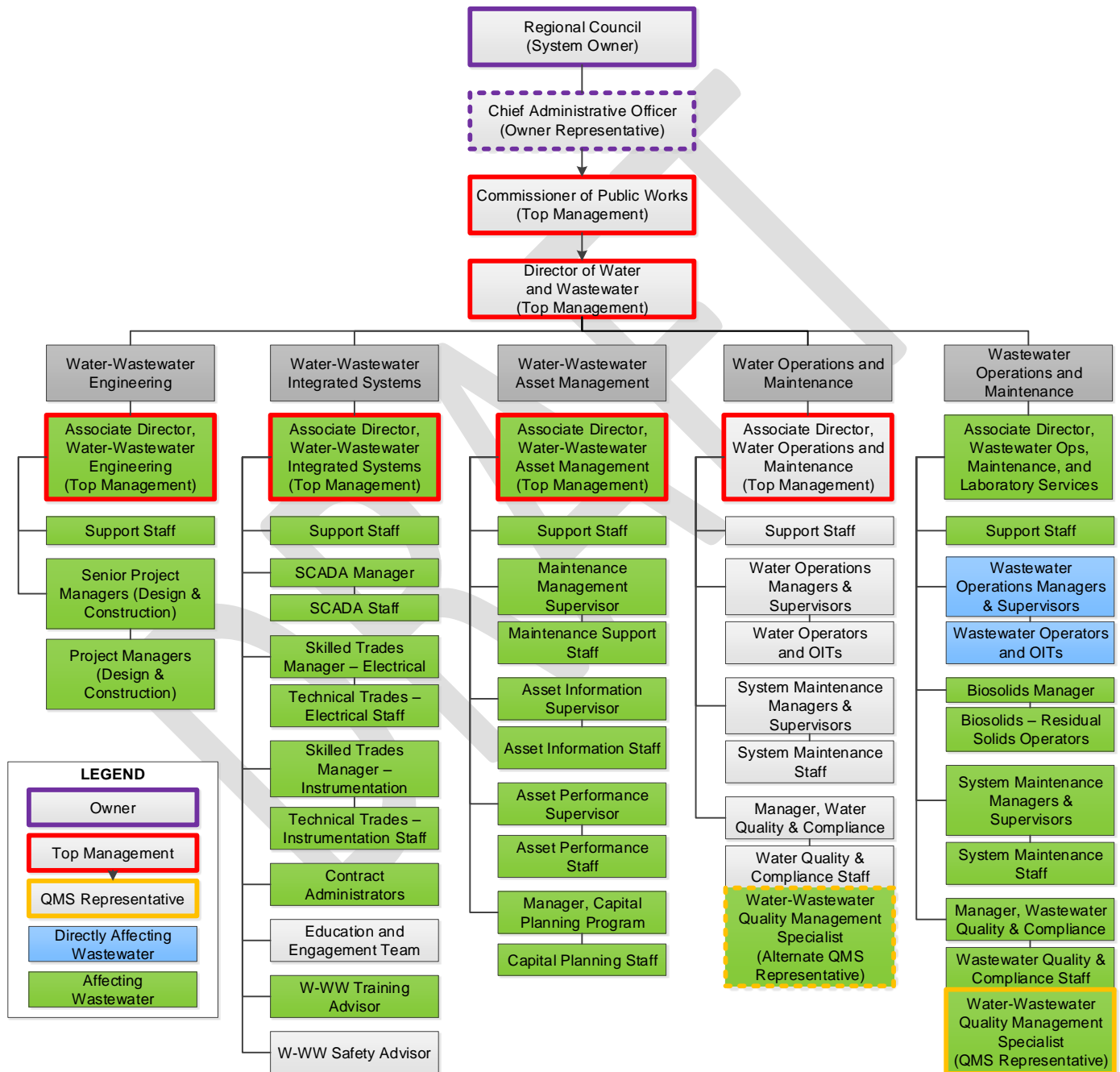
9.1 What We Do

The Water and Wastewater Services Division is made up of a dedicated team of approximately 270 employees working throughout the Niagara Region. The Division is divided into five groups:

- Water Operations, Maintenance, and Staff Development;
- Wastewater Operations, Maintenance, and Laboratory Services;
- Water-Wastewater Engineering;
- Water-Wastewater Integrated Systems;
- Water-Wastewater Asset Management.

The organizational structure of the Water and Wastewater Services Division is illustrated in Figure 2.

Figure 2: Water and Wastewater Services Division – Organizational Structure



Each of the **five** working groups within the division has varying levels of responsibility for wastewater effluent quality. Core responsibilities of staff in each group, as well as specific duties for those positions that impact wastewater effluent quality, are identified in Table 2. Table 2 also identifies responsibilities of the System Owner, Top Management and the QMS Representative. *(NOTE: Positions that are greyed in Table 2 have been deemed to not directly impact wastewater effluent quality.)*

Table 2: QMS Responsibilities and Authorities

Position/Group	Responsibilities	Authorities
Regional Council (System Owner)	<ul style="list-style-type: none"> – Act as final decision-making body for Niagara Region – Ensure the provision of adequate resources for the operation and maintenance of Niagara Region's wastewater collection and treatment facilities – Endorse Niagara Region's Wastewater QMS 	<ul style="list-style-type: none"> – Perform listed responsibilities – Delegate
Chief Administrative Officer	<ul style="list-style-type: none"> – Act as representative for the Owner – Interact with Top Management 	<ul style="list-style-type: none"> – Perform listed responsibilities – Delegate
Commissioner of Public Works (Top Management)	<ul style="list-style-type: none"> – Establish and implement operating policy and procedures, covering execution of department functions – Manage Public Works Department in its statutory, operational, custodial and advisory responsibilities – Act as a member of the Corporate Management Team – Participate in Management Review 	<ul style="list-style-type: none"> – Perform listed responsibilities – Discipline staff – Make engineering decisions – Make administrative decisions related to Public Works – Delegate
Director of Water and Wastewater (Top Management)	<ul style="list-style-type: none"> – Provide administration and general management of Water and Wastewater Services Division – Ensure mandated delivery of water supply and wastewater treatment meets federal, provincial and municipal requirements 	<ul style="list-style-type: none"> – Perform listed responsibilities – Establish Divisional priorities; control

Position/Group	Responsibilities	Authorities
	<ul style="list-style-type: none"> – Provide guidance and direction to staff to ensure compliance with provincial standards and the promotion of industry best practices for the operation of the water systems – Participate in Management Review 	<ul style="list-style-type: none"> budgets, costs, and work quality – Take appropriate action to ensure health and safety in emergencies – Delegate
Wastewater Operations and Maintenance		
Associate Director of Wastewater (Affecting Wastewater) (Top Management)	<ul style="list-style-type: none"> – Maintain accountability for execution and direction of all aspects of wastewater system operation and maintenance – Manage Region’s wastewater treatment operations to ensure compliance with regulatory requirements and due diligence in daily activities – Demonstrate due diligence in daily activities and keep abreast of relevant legislation and regulations – Ensure adequate health and safety program in place for Wastewater Services – Analyze and develop annual current and capital budgets to ensure that operations are cost effective – Continually review overall function of facilities, personnel, communications, and training to achieve high standard of performance – Direct activities related to public relations, evaluating investigations and preparing reports – Ensure staff/personnel issues are dealt with effectively and in a timely manner – Coordinate employee efforts and respond to emergencies and complaints – Provide leadership for emergency preparedness – Participate in Management Review – May function as “Overall Responsible Operator (ORO)” as required by O. Reg. 129/04, if appropriately certified to do so 	<ul style="list-style-type: none"> – Perform listed responsibilities – Approve purchases in accordance with approved budget and policies and procedures – Discipline and deal with major personnel matters – Suggest modifications to systems and make changes during construction – Recommend purchase of equipment or services involving major expenditures – Delegate

Position/Group	Responsibilities	Authorities
Wastewater Operations Manager & Supervisor (Directly Affecting Wastewater)	<ul style="list-style-type: none"> – Supervise operation of wastewater treatment plants and regional collection system – Control budget for area and procure material and services as needed to ensure efficient operation – Ensure due diligence in daily activities and compliance with regulatory requirements – Ensure staff follow safe work practices as outlined in health and safety procedures; provide PPE and training as needed – Participate in Public relations, evaluate investigations and preparing reports – Respond to emergencies and complaints – Function as “Overall Responsible Operator (ORO)” as required by O. Reg. 129/04 	<ul style="list-style-type: none"> – Perform listed responsibilities – Approve purchases in accordance with approved budget and policies and procedures – Discipline and deal with minor personnel matters (Managers only) – Make suggestions for continual improvement – Issue notice of non-compliance – Delegate
System Operator (Directly Affecting Wastewater)	<ul style="list-style-type: none"> – Perform operational functions – Maintain written and computer based daily records – Perform routine inspections of plant – Prepare work orders for repairs to equipment – Collect and test wastewater samples to monitor/maintain relevant parameters – Serve as “Operator-In-Charge (OIC)” 	<ul style="list-style-type: none"> – Perform listed responsibilities – Make suggestions for continual improvement
Operator-in-Training (OIT) (Directly Affecting Wastewater)	<ul style="list-style-type: none"> – Perform duties of System Operator, with conditions: <ul style="list-style-type: none"> ○ Operators-in-Training must perform some responsibilities at the direction of System Operator, as required by O. Reg. 128/04 ○ When an OIT is operating, the ORO shall be designated as OIC 	<ul style="list-style-type: none"> – Perform listed responsibilities – Suggest continual improvements

Position/Group	Responsibilities	Authorities
Biosolids Supervisor (Affecting Wastewater)	<ul style="list-style-type: none"> – Supervise operation of biosolids treatment facility and lagoons – Control budget for area and procure material and services as needed to ensure efficient operation – Ensure due diligence in daily activities and compliance with regulatory requirements – Ensure staff follow safe work practices as outlined in health and safety procedures; provide PPE and training as needed – Participate in public relations, evaluate investigations and preparing reports – Respond to emergencies and complaints 	<ul style="list-style-type: none"> – Perform listed responsibilities – Approve purchases in accordance with approved budget and policies and procedures – Discipline and deal with minor personnel matters – Make suggestions for continual improvement – Delegate
Biosolids – Residual Solids Operator (Affecting Wastewater)	<ul style="list-style-type: none"> – Perform operational functions – Maintain written and computer based daily records – Prepare work orders for repairs to equipment – Collect and test process samples to monitor/maintain relevant parameters 	<ul style="list-style-type: none"> – Perform listed responsibilities – Make suggestions for continual improvement
Support Staff (Affecting Wastewater)	<ul style="list-style-type: none"> – Maintain appropriate control of documents & records – Assist with communications, public relations, investigations and report preparation as needed – Clerical functions – Assist with customer service activities including responding to complaints 	<ul style="list-style-type: none"> – Perform listed responsibilities – Make suggestions for continual improvement
Wastewater Systems Maintenance Managers (Affecting Wastewater)	<ul style="list-style-type: none"> – Direct and supervise Maintenance staff within area during regular, emergency, standby and on-call hours – Demonstrate due diligence in daily activities and ensure compliance with relevant regulations and Regional policies 	<ul style="list-style-type: none"> – Perform listed responsibilities – Delegate – Discipline and deal with minor personnel matters

Position/Group	Responsibilities	Authorities
	<ul style="list-style-type: none"> – Control budget for area; monitor expenditures and procurement of materials and services – Prepare and modify maintenance schedules to provide for normal maintenance relief, staff training, vacation, lieu time, and sick time – Participate in activities related to public relations, evaluating investigations and preparing reports – Ensure staff follow safe work practices as outlined in health and safety procedures; provide PPE and training as needed – Respond to emergencies and complaints – Scoping, design and construction of projects 	<ul style="list-style-type: none"> – Make suggestions for continual improvement
Systems Maintenance Staff (Affecting Wastewater)	<ul style="list-style-type: none"> – Respond to general system maintenance issues – Complete preventive maintenance tasks 	<ul style="list-style-type: none"> – Perform listed responsibilities – Make suggestions for continual improvement
Manager of Quality and Compliance, Wastewater (Affecting Wastewater)	<ul style="list-style-type: none"> – Ensure processes are optimized and maintained – Develop and implement quality sampling program as required in a collection system – Ensure staff follow safe work practices as outlined in health and safety procedures; provide PPE and training as needed – Administer environmental enforcement program – Act as Lead Auditor for the ISO 17025 laboratory management system 	<ul style="list-style-type: none"> – Perform listed responsibilities – Make suggestions for continual improvement – Discipline and deal with minor personnel matters – Issue notices of non-compliance – Delegate
W&WW Quality Management Specialist (QMS Rep) (Affecting Wastewater)	<ul style="list-style-type: none"> – See QMS Representative Responsibilities in Operational Plan (Section 4) 	<ul style="list-style-type: none"> – Perform listed responsibilities – Suggest continual improvements

Position/Group	Responsibilities	Authorities
Environmental Laboratory Supervisor (Affecting Wastewater)	<ul style="list-style-type: none"> – Supervise Environmental Laboratory staff – Control budget for area and procure material and services as needed to ensure efficient operation – Ensure due diligence in daily activities and compliance with regulatory requirements – Ensure staff follow safe work practices as outlined in health and safety procedures; provide PPE and training as needed 	<ul style="list-style-type: none"> – Perform listed responsibilities – Make suggestions for continual improvement – Discipline and deal with minor personnel matters – Delegate
Environmental Laboratory Staff (Affecting Wastewater)	<ul style="list-style-type: none"> – Conduct analytical wastewater and biosolids testing – Follow established protocols for sampling and testing – Provide notification of any exceedances 	<ul style="list-style-type: none"> – Perform listed responsibilities – Make suggestions for continual improvement
Environmental Enforcement Staff (Affecting Wastewater)	<ul style="list-style-type: none"> – Determine sampling locations and methods, and collect water or wastewater samples for analysis – Inspect wastewater treatment and disposal facilities and systems for compliance to federal, provincial, and/or local regulations (including Environmental Compliance Approvals) – Examine permits, licences, applications, and records to ensure compliance with licencing requirements – Prepare, organize & maintain inspection records – Monitor follow-up actions in instances where violations were found, and review compliance monitoring reports – Act as relief Operators as required 	<ul style="list-style-type: none"> – Perform listed responsibilities – Make suggestions for continual improvement – Recommend notices of non-compliance
Process Engineer, Wastewater (Affecting Wastewater)	<ul style="list-style-type: none"> – Complete process optimization activities 	<ul style="list-style-type: none"> – Perform listed responsibilities – Make suggestions for continual improvement

Position/Group	Responsibilities	Authorities
Compliance Technologist, Wastewater (Affecting Wastewater)	<ul style="list-style-type: none"> – Maintain appropriate control of documents and records – Assist with developing and implementing quality sampling programs as required in collection systems – Assist with audits, investigations and preparing reports as needed by Operations – Complete federal external compliance reporting – Apply for approvals and amendments to Environmental Compliance Approvals and to the Environmental Activity and Sector Registry – Complete benchmarking activities 	<ul style="list-style-type: none"> – Perform listed responsibilities – Make suggestions for continual improvement
Integrated Systems		
Associate Director, Water-Wastewater Integrated Systems (Top Management)	<ul style="list-style-type: none"> – Demonstrate due diligence in daily activities and keep abreast of relevant legislation and regulations – Ensure support of SCADA, Instrumentation, Electrical, Contract Administration, Health and Safety, Training, and Education/Engagement teams and maintenance of related infrastructure and equipment – Analyze and develop annual current and capital budgets to ensure continuity of operations – Continually review overall function of working group to achieve high standard of performance – Direct activities related to public relations, evaluating investigations and preparing reports – Ensure staff/personnel issues are dealt with effectively and in a timely manner – Coordinate employee efforts and respond to emergencies and complaints – Ensure staff follow safe work practices as outlined in Health and Safety procedures; provide PPE and training as needed – Participate in Management Review 	<ul style="list-style-type: none"> – Perform listed responsibilities – Approve purchases in accordance with approved budget and policies and procedures – Discipline and deal with major personnel matters – Suggest modifications to systems – Recommend purchase of equipment or services involving major expenditures – Delegate – Suggest continual improvements

Position/Group	Responsibilities	Authorities
SCADA Manager (Affecting Wastewater)	<ul style="list-style-type: none"> – Manage and administer SCADA resources to achieve Divisional goals and objectives – Control budget for area and procure material and services to provide customers both internal and external, with efficient and cost effective skilled support – Demonstrate due diligence in daily activities and ensure compliance with relevant Regulations and Regional Policies – Participate in activities related to public relations, evaluating investigations and preparing reports – Respond to emergencies and complaints – Ensure staff follow safe work practices as outlined in Health and Safety procedures; provide PPE and training as needed – Scoping, design and construction of projects 	<ul style="list-style-type: none"> – Perform listed responsibilities – Delegate – Suggest continual improvements
Skilled Trades Managers (Instrumentation and Electrical) (Affecting Wastewater)	<ul style="list-style-type: none"> – Manage and administer skilled trades resources to achieve Divisional goals and objectives – Control budget for area and procure material and services to provide customers both internal and external, with efficient and cost effective skilled support – Demonstrate due diligence in daily activities and ensure compliance with relevant Regulations and Regional Policies – Participate in activities related to Public relations, evaluating investigations and preparing reports – Respond to emergencies and complaints – Ensure staff follow safe work practices as outlined in Health and Safety procedures; provide PPE and training as needed – Scoping, design and construction of projects 	<ul style="list-style-type: none"> – Perform listed responsibilities – Supervise daily activities of Technical Trades staff – Delegate – Suggest continual improvements

Position/Group	Responsibilities	Authorities
SCADA and Technical Trades Staff (<i>Affecting Wastewater</i>)	<ul style="list-style-type: none"> Respond to maintenance issues (i.e. electrical problems, SCADA issues, etc.) 	<ul style="list-style-type: none"> Perform listed responsibilities Make suggestions for continual improvement
Contract Administrators (<i>Affecting Wastewater</i>)	<ul style="list-style-type: none"> Review, amend and administer annual contracts for Water-Wastewater Services Prepare authorizations and approvals for contract and bid awards Monitor and supervise maintenance projects 	<ul style="list-style-type: none"> Perform listed responsibilities Make suggestions for continual improvement
W-WW Training Advisor (<i>Affecting Wastewater</i>)	<ul style="list-style-type: none"> Develop and maintain divisional training programs 	<ul style="list-style-type: none"> Perform listed responsibilities Suggest continual improvements
W-WW Safety Advisor	<ul style="list-style-type: none"> Develop and maintain divisional health & safety programs 	<ul style="list-style-type: none"> Perform listed responsibilities Suggest continual improvements
Education and Engagement Team	<ul style="list-style-type: none"> Manage divisional communications and public outreach activities 	<ul style="list-style-type: none"> Perform listed responsibilities Suggest continual improvements
Engineering		
Associate Director, Engineering (Top Management)	<ul style="list-style-type: none"> Hold accountability for scoping, design and construction of engineering projects connected with Region's water and wastewater systems Analyze and develop annual current and capital budgets to ensure that operation plans are cost effective Manage & administer capital project resources to achieve Divisional goals and objectives 	<ul style="list-style-type: none"> Perform listed responsibilities Suggest modifications to systems and make changes during construction

Position/Group	Responsibilities	Authorities
	<ul style="list-style-type: none"> – Demonstrate due diligence in daily activities and keep abreast of relevant legislation and regulations Communicate project progress with other working groups within and outside of Water-Wastewater Services – Direct and supervise Project Management staff – Participate in infrastructure planning and review activities – Participate in Management Review – Participate in public relations, evaluate investigations and preparing reports – Ensure staff follow safe work practices as outlined in Health and Safety procedures; provide PPE and training as needed – Respond to emergencies and complaints 	<ul style="list-style-type: none"> – Delegate – Discipline and deal with major personnel matters – Make suggestions for continual improvement
Senior Project Manager, Design and Construction (Affecting Wastewater)	<ul style="list-style-type: none"> – Lead the scoping, design and construction of large scale projects related to Region's systems – Infrastructure planning and review – Communicate project progress with Management – Control budget for projects and procure material and services as needed to ensure efficient operation – Ensure due diligence in daily activities and compliance with regulatory requirements including assisting with the preparation of applications for approvals and amendments with the Ministry of Environment and Climate Change – Participate in infrastructure planning and review activities – Participate in public relations, evaluate investigations and preparing reports – Respond to emergencies and complaints – Assist Project Managers with issues as required 	<ul style="list-style-type: none"> – Perform listed responsibilities – Make suggestions for continual improvement

Position/Group	Responsibilities	Authorities
Project Manager, Design and Construction (<i>Affecting Wastewater</i>)	<ul style="list-style-type: none"> – Lead the scoping, design and construction of projects related to Region's systems – Infrastructure planning and review – Communicate project progress with Management – Control budget for area and procure material and services as needed to ensure efficient operation – Ensure due diligence in daily activities and compliance with regulatory requirements including assisting with the preparation of applications for approvals and amendments with the Ministry of Environment – Participate in infrastructure planning and review activities – Participate in public relations, evaluate investigations and preparing reports – Respond to emergencies and complaints 	<ul style="list-style-type: none"> – Perform listed responsibilities – Make suggestions for continual improvement
Engineering Support Staff (<i>Affecting Wastewater</i>)	<ul style="list-style-type: none"> – Document & Record Control – Assist with communications, Public relations, investigations and preparing reports as needed by Operations – Clerical functions – Assist with Customer Service activities including responding to complaints 	<ul style="list-style-type: none"> – Perform listed responsibilities – Make suggestions for continual improvement

Position/Group	Responsibilities	Authorities
Asset Management		
Associate Director, Asset Management (Top Management)	<ul style="list-style-type: none"> Establish and maintain a divisional asset management plan, capital planning, and infrastructure data management for the Region's water and wastewater systems Oversee collection, review and analysis of operational and maintenance data to ensure all information relating to W-WW infrastructure is acquired, stored, and made available to those in other sections and departments Develop capital plans for W-WW infrastructure Oversee development of the 10-year capital forecast Demonstrate due diligence in daily activities and keep abreast of relevant legislation and regulations Communicate project progress with other working groups within and outside of Water-Wastewater Services Direct and supervise Asset Management staff Participate in Management Review Ensure staff follow safe work practices as outlined in Health and Safety procedures; provide PPE and training as needed Respond to emergencies and complaints 	<ul style="list-style-type: none"> Perform listed responsibilities Delegate Discipline and deal with major personnel matters Suggest continual improvements
Supervisor, Water-Wastewater Maintenance Management (Affecting Wastewater)	<ul style="list-style-type: none"> Manage and administer support resources to achieve divisional goals and objectives Control budget for area and procure material and services to provide internal and external customer with efficient/cost-effective support Demonstrate due diligence in daily activities and ensure compliance with relevant regulations and regional policies Ensure staff follow safe work practices as outlined in health and safety procedures; provide PPE and training as needed Maintain CMMS program 	<ul style="list-style-type: none"> Perform listed responsibilities Discipline and deal with minor personnel matters Make suggestions for continual improvement

Position/Group	Responsibilities	Authorities
Maintenance Support Staff (CMMS, Clerks) (Affecting Wastewater)	<ul style="list-style-type: none"> – Maintain control of documents and records – Assist with communications, public relations, investigations and preparing reports as needed by Maintenance staff – Complete clerical functions – Assist with customer service activities, including responding to complaints 	<ul style="list-style-type: none"> – Perform listed responsibilities – Make suggestions for continual improvement –
Asset Information Supervisor (Affecting Wastewater)	<ul style="list-style-type: none"> – Manage and administer Water & Wastewater GIS (Geographic Information Systems) and IMS (Information Management Systems) to achieve Divisional goals and objectives – Direct and supervise Asset Information staff – Communicate project progress with Management – Control budget for area and procure material and services as needed to ensure efficient operation – Ensure due diligence in daily activities and compliance with regulatory requirements – Ensure staff follow safe work practices as outlined in Health and Safety procedures; provide PPE and training as needed – Participate in public relations, evaluate investigations and preparing reports – Respond to emergencies and complaints 	<ul style="list-style-type: none"> – Perform listed responsibilities – Discipline and deal with minor personnel matters – Make suggestions for continual improvement –
Asset Information Staff (Affecting Wastewater)	<ul style="list-style-type: none"> – Coordinate the locating of sub-surface Water & Wastewater assets – Review engineering drawings and resolve discrepancies – Tracking and updating asset lifecycle data – Assist with the administration of the Water & Wastewater GIS and IMS 	<ul style="list-style-type: none"> – Perform listed responsibilities – Make suggestions for continual improvement
Asset Performance Management Supervisor (Affecting Wastewater)	<ul style="list-style-type: none"> – Direct and supervise Asset Performance staff – Manage and administer asset performance resources to achieve Divisional goals and objectives – Participate in infrastructure planning and review activities 	<ul style="list-style-type: none"> – Perform listed responsibilities – Discipline and deal with minor personnel matters

Position/Group	Responsibilities	Authorities
	<ul style="list-style-type: none"> – Communicate project progress with Management – Control budget for area and procure material and services as needed to ensure efficient operation – Ensure due diligence in daily activities and compliance with regulatory requirements – Ensure staff follow safe work practices as outlined in Health and Safety procedures; provide PPE and training as needed – Participate in public relations, evaluate investigations and preparing reports – Respond to emergencies and complaints 	<ul style="list-style-type: none"> – Make suggestions for continual improvement –
Asset Performance Staff (Affecting Wastewater)	<ul style="list-style-type: none"> – Collect flow measurements, dimensional analysis and visual resources for wastewater systems – Conduct field inspections of assets – Perform emergency locates – Collect spatial coordinates for inclusion into the Water & Wastewater GIS systems – Monitor, maintain and update environmental systems and conduct evaluations for flow and weather – Assist with design and maintenance for new and existing water and wastewater systems 	<ul style="list-style-type: none"> – Perform listed responsibilities – Make suggestions for continual improvement
Manager, Water-Wastewater Capital Program Planning (Affecting Wastewater)	<ul style="list-style-type: none"> – Manage and administer infrastructure planning and review to achieve Divisional goals and objectives – Direct and supervise Capital Planning staff – Communicate project progress with Management – Control budget for area and procure material and services as needed to ensure efficient operation – Ensure due diligence in daily activities and compliance with regulatory requirements – Ensure staff follow safe work practices as outlined in Health and Safety procedures; provide PPE and training as needed 	<ul style="list-style-type: none"> – Perform listed responsibilities – Discipline and deal with minor personnel matters – Make suggestions for continual improvement

Position/Group	Responsibilities	Authorities
	<ul style="list-style-type: none"> – Participate in public relations, evaluate investigations and preparing reports – Respond to emergencies and complaints 	
Project Manager, Capital Program Planning (Affecting Wastewater)	<ul style="list-style-type: none"> – Lead the scoping, design and construction of projects related to Region's systems – Infrastructure planning and review – Communicate project progress with Management – Control budget for area and procure material and services as needed to ensure efficient operation – Ensure due diligence in daily activities and compliance with regulatory requirements including assisting with the preparation of applications for approvals and amendments with the Ministry of Environment – Ensure staff follow safe work practices as outlined in Health and Safety procedures; provide PPE and training as needed – Participate in public relations, evaluate investigations and preparing reports – Respond to emergencies and complaints 	<ul style="list-style-type: none"> – Perform listed responsibilities – Make suggestions for continual improvement
Support Staff	<ul style="list-style-type: none"> – Maintain appropriate control of documents and records – Assist with communications, public relations, investigations and preparing reports as needed by Engineering – Complete clerical functions – Assist with customer service activities, including responding to complaints 	<ul style="list-style-type: none"> – Perform listed responsibilities – Suggest continual improvements
Water Operations and Maintenance		
Associate Director, Water Operations, Maintenance, and Staff Development	<ul style="list-style-type: none"> – Maintain accountability for execution and direction of all aspects of drinking water system operation and maintenance – Manage Region's water treatment operations and maintenance to ensure compliance with 	<ul style="list-style-type: none"> – Perform listed responsibilities – Approve purchases in accordance with approved

Position/Group	Responsibilities	Authorities
(Top Management)	<ul style="list-style-type: none"> regulatory requirements and ensure due diligence in daily activities – Demonstrate due diligence in daily activities and keep abreast of relevant legislation and regulations – Ensure adequate health and safety program in place for Water and Wastewater – Analyze and develop annual current and capital budgets to ensure that operations are cost effective – Continually review overall function of facilities, personnel, communications and training to achieve high standard of performance – Direct activities related to public relations, evaluating investigations and preparing reports – Ensure staff/personnel issues are dealt with effectively and in a timely manner – Coordinate employee efforts and respond to emergencies and complaints – Provide leadership for emergency preparedness – Participate in Management Review – May function as “Overall Responsible Operator (ORO)” as required by O. Reg. 128/04 	<ul style="list-style-type: none"> budget and policies and procedures – Discipline and deal with major personnel matters – Suggest modifications to systems and make changes during construction – Recommend purchase of equipment or services involving major expenditures – Delegate – Make suggestions for continual improvement
Water Operations Managers/ Supervisors	<ul style="list-style-type: none"> – Supervise operation of water treatment plants and regional transmission system – Control area budget; procure material/services as needed to ensure efficient operation – Ensure due diligence in daily activities and compliance with regulatory requirements – Participate in Public relations, evaluate investigations and preparing reports – Ensure staff follow safe work practices as outlined in Health and Safety procedures; provide PPE and training as needed – Respond to emergencies and complaints – Function as “Overall Responsible Operator (ORO)” as required by O. Reg. 128/04 	<ul style="list-style-type: none"> – Perform listed responsibilities – Delegate – Discipline and deal with minor personnel matters <i>(Managers only)</i> – Make suggestions for continual improvement

Position/Group	Responsibilities	Authorities
System Operator and Operator-in-Training (OIT)	<ul style="list-style-type: none"> – Perform operational functions – Maintain written and computer based daily records – Perform routine inspections of plant – Prepare work orders for repairs to equipment – Collect and test water samples to monitor/maintain relevant parameters – Serve as “Operator-In-Charge (OIC)”: <ul style="list-style-type: none"> ○ Operators-in-Training must perform some responsibilities at the direction of System Operator, as required by O. Reg. 128/04 ○ When an OIT is operating, the ORO shall be designated as OIC 	<ul style="list-style-type: none"> – Perform listed responsibilities – Make suggestions for continual improvement
Support Staff	<ul style="list-style-type: none"> – Maintain appropriate control of documents and records – Assist with communications, public relations, investigations and preparing reports as needed by Operations – Clerical functions – Assist with customer service activities, including responding to complaints 	<ul style="list-style-type: none"> – Perform listed responsibilities – Make suggestions for continual improvement
Water Systems Maintenance Managers	<ul style="list-style-type: none"> – Direct and supervise Maintenance staff within area during regular, emergency, standby and on-call hours – Demonstrate due diligence in daily activities and ensure compliance with relevant Regulations and Regional Policies – Control budget for area; monitor expenditures and procurement of materials and services – Prepare and modify maintenance schedules to provide for normal maintenance relief, staff training, vacation, lieu time, and sick time – Participate in activities related to public relations, evaluating investigations and preparing reports 	<ul style="list-style-type: none"> – Perform listed responsibilities – Delegate – Discipline and deal with minor personnel matters – Make suggestions for continual improvement

Position/Group	Responsibilities	Authorities
	<ul style="list-style-type: none"> – Ensure staff follow safe work practices as outlined in Health and Safety procedures; provide PPE and training as needed – Respond to emergencies and complaints – Assist in scoping, design and construction of projects 	
Systems Maintenance Staff	<ul style="list-style-type: none"> – Respond to maintenance issues (i.e. general systems maintenance, etc.) – May serve as “Operator-In-Charge (OIC)” in the transmission system 	<ul style="list-style-type: none"> – Perform listed responsibilities – Make suggestions for continual improvement
Manager, Water Quality and Compliance	<ul style="list-style-type: none"> – Ensure processes are optimized and maintained – Develop and implement quality sampling program as required in a collection/ transmission/distribution system – Act as Lead Auditor – Ensure training program is maintained in order to meet competencies – Ensure staff follow safe work practices as outlined in health and safety procedures; provide PPE and training as needed 	<ul style="list-style-type: none"> – Perform listed responsibilities – Delegate – Make suggestions for continual improvement
Quality & Compliance Staff (Affects Wastewater – selected roles)	<ul style="list-style-type: none"> – Training Program – Health & Safety Program – Technical Support – Process Optimization – Communications and Public Outreach – Compliance Support 	<ul style="list-style-type: none"> – Perform listed responsibilities – Make suggestions for continual improvement
W-WW Quality Management Specialist (Alternate QMS Rep) (Affecting Wastewater)	<ul style="list-style-type: none"> – See QMS Representative Responsibilities in Operational Plan (Section 4) 	<ul style="list-style-type: none"> – Perform listed responsibilities – Delegate – Make suggestions for continual improvement

Position/Group	Responsibilities	Authorities
W-WW Training Advisor (Affecting Wastewater)	<ul style="list-style-type: none"> Identify essential and supplementary training needs Develop and coordinate annual training plan Maintain training records 	<ul style="list-style-type: none"> Perform listed responsibilities Make suggestions for continual improvement
W-WW Safety Advisor (Affecting Wastewater)	<ul style="list-style-type: none"> Review operating procedures and emergency preparedness plan and upgrades Provide safety information and programs to W-WW Division staff Investigate health and safety incidents 	<ul style="list-style-type: none"> Perform listed responsibilities Make suggestions for continual improvement
Supervisor, W-WW Development Program (Affecting Wastewater)	<ul style="list-style-type: none"> Perform assigned supervisory functions Interact with engineering, maintenance, operations, and biosolids groups Ensure due diligence in daily activities and compliance with regulatory requirements Ensure staff follow safe work practices as outlined in health and safety procedures; provide PPE and training as needed Participate in Public relations, evaluate investigations and preparing reports Respond to emergencies and complaints Function "Overall Responsible Operator (ORO)" as required by Ontario Regulation 129/04 	<ul style="list-style-type: none"> Perform listed responsibilities Discipline and deal with minor personnel matters Make suggestions for continual improvement Delegate

10. Competencies

Niagara Region personnel performing duties affecting wastewater effluent must understand the importance of their actions. Furthermore, they must be competent in their jobs and have appropriate education, training, skills and/or experience.

The [Competencies Table \(QMS-ALL-ALL-T-100\)](#) documents competencies required for personnel performing duties affecting wastewater effluent quality.

[Competencies \(QMS-WW-ALL-P-100\)](#) documents activities to develop and maintain the required competencies for personnel performing duties affecting wastewater effluent quality. It also documents activities to ensure that all Operating Authority personnel are aware of the relevance of their duties.

[Competencies \(QMS-WW-ALL-P-100\)](#) and the [Competencies Table \(QMS-ALL-ALL-T-100\)](#) are available via the Regional intranet.

11. Personnel Coverage

Niagara Region ensures that sufficient personnel meeting identified competencies are available for duties that affect wastewater effluent quality as documented in [Personnel Coverage \(QMS-WW-ALL-P-110\)](#).

[Personnel Coverage \(QMS-WW-ALL-P-110\)](#) is available via the Regional intranet.

12. Communications

Effective communication is essential for ensuring the success of a QMS. [Communications \(QMS-WW-ALL-P-120\)](#) describes how relevant aspects of the QMS are communicated between Top Management and the Owner, Operating Authority personnel, Suppliers and the Public.

[Communications \(QMS-WW-ALL-P-120\)](#) is available via the Regional intranet.

13. Essential Supplies and Services

Niagara Region's wastewater systems require a number of essential supplies and services for the effective treatment of wastewater. These supplies and services are categorized as:

- Chemical supplies;
- Calibration services;
- Laboratory services;
- Miscellaneous supplies and services

Essential supplies and services are identified on the ["Essential Supplies and Services" Vine page](#). Methods to ensure procurement and quality of essential supplies and services are outlined in [Essential Supplies and Services \(QMS-WW-ALL-P-130\)](#).

[Essential Supplies and Services \(QMS-WW-ALL-P-130\)](#) and the ["Essential Supplies and Services" Vine page](#) are both available via the Regional intranet. **The table can be filtered to show only those supplies and services used in respect of Niagara Region's wastewater systems.**

NOTE: Only wastewater system supplies and services fall within the scope of this Operational Plan.

14. Review, Rehabilitation and Renewal of Infrastructure

[Review, Rehabilitation and Renewal of Infrastructure \(QMS-WW-ALL-P-140\)](#) describes how Niagara Region reviews the adequacy of infrastructure necessary to operate and maintain its wastewater systems. It also details how capially-funded infrastructure rehabilitation and renewal projects are initiated, approved, and communicated to the Owner.

[Review, Rehabilitation and Renewal of Infrastructure \(QMS-WW-ALL-P-140\)](#) is available via the Regional intranet.

15. Infrastructure Maintenance

Niagara Region maintains an effective maintenance program. The maintenance program includes planned and unplanned **infrastructure** maintenance, renewal, and rehabilitation **activities that are** typically funded from the current budget. [Maintenance \(QMS-WW-ALL-P-150\)](#) describes the maintenance program, **long-term maintenance, rehabilitation, and renewal plans**, the means to monitor maintenance effectiveness, and how maintenance programs are communicated to the Owner.

[Maintenance \(QMS-WW-ALL-P-150\)](#) is available via the Regional intranet.

16. Sampling, Testing and Monitoring

Sampling, testing and monitoring activities are essential to confirm wastewater effluent quality and to maintain compliance with applicable legislation and regulations. [Sampling, Testing and Monitoring \(QMS-WW-ALL-P-160\)](#) describes these activities and how results are recorded and shared. To support the procedure, a table has been prepared² for each WWTP that outlines sampling, testing, and monitoring activities at the WWTP.

[Sampling, Testing and Monitoring \(QMS-WW-ALL-P-160\)](#) and the supporting tables are available via the Regional intranet.

17. Measurement & Recording Equipment Calibration & Maintenance

The measurement and recording equipment used in Niagara Region's wastewater systems is calibrated and maintained according to [Measurement and Recording Equipment Calibration and Maintenance \(QMS-WW-ALL-P-170\)](#).

² NOTE: Tables have been created for selected WWTPs; the remaining tables are in development. Sampling plans are established and in place for all WWTPs.

[Measurement and Recording Equipment Calibration and Maintenance \(QMS-WW-ALL-P-170\)](#)

is available via the Regional intranet.

18. Emergency Management

Emergency preparedness is achieved by following Niagara Region's Emergency Response Procedures (ERP) Manual for Water and Wastewater Systems. The ERP Manual includes response and recovery procedures for potential emergencies that could impact the wastewater process, effluent quality, and/or the environment. Each procedure is laid out step by step and clearly notes responsibilities of those involved. Training and testing requirements are specified in [Water and Wastewater Emergency Response Plan \(ERP-ALL-ALL-P-001\)](#). An [Emergency Response Contact List \(ERP-ALL-ALL-T-002\)](#) is also included as part of the ERP Manual.

The ERP Manual is available on the Vine's [Water-Wastewater Services Division Page](#) under "W-WW Emergency Response Plan".

19. Internal Audits

Internal audits add value to Niagara Region's operations by providing feedback about the Wastewater QMS and its effectiveness. [Internal Auditing \(QMS-WW-ALL-P-190\)](#) describes:

- How to evaluate the conformity of Niagara Region's QMS with the requirements of the Standard;
- Audit criteria, frequency, scope, methodology and record keeping requirements;
- How previous internal and external audit results are considered; and
- How corrective actions are identified and initiated (see Section 21 of this Operational Plan).

[Internal Auditing \(QMS-WW-ALL-P-190\)](#) is available via the Regional intranet.

20. Management Review

Management Reviews are performed to ensure the continuing suitability, adequacy and effectiveness of the QMS. [Management Review \(QMS-WW-ALL-P-200\)](#) documents the process followed in undertaking the review.

[Management Review \(QMS-WW-ALL-P-200\)](#) is available via the Regional intranet.

21. Continual Improvement

Niagara Region maintains and continually improves the QMS through annual internal audits, management reviews, process optimization projects, and staff development activities:

- Non-conformances and opportunities for improvement are identified and reported through the QMS *internal audit process*. Corrective actions are then initiated to resolve and eliminate the non-conformances.
- Deficiencies identified as part of the annual *management review* are discussed, and action plans are created to improve the QMS.
- Many of Niagara Region's *process optimization projects* are initiated from benchmarking results. Benchmarking involves the analysis of performance measures across Niagara's wastewater systems. These results are used to identify best practices and prioritize areas for improvement.
- Niagara Region staff play a critical role in the implementation and improvement of the QMS. We are committed to providing effective *staff development* opportunities (e.g. courses, workshops, on the job training, etc.) in an effort to continually improve our operations.

[Corrective Action \(QMS-WW-ALL-P-210\)](#) documents how corrective actions are used to continually improve the QMS. The procedure is available via the Regional intranet.

22. Table of Revisions:

Revision	Date	Description of Revision	Updated By
0	Jun. 30, 2015	Operational Plan created and endorsed. <i>Endorsed by Regional Council.</i>	Jen Croswell
1	Jan. 7, 2016	Revisions to: <ul style="list-style-type: none"> Section 3 (Commitment and Endorsement): Revised how written records of commitment and endorsement are obtained and updated Section 9 (Organizational Structure, Roles, Responsibilities and Authorities): <ul style="list-style-type: none"> Removed Environmental Enforcement from directly affecting wastewater and changed to affecting wastewater Added the Associate Director Engineering to Top Management (Water OFI 2015-002-Internal) Expanded Laboratory Staff to Environmental Laboratory Supervisor and Environmental Laboratory staff Included additional responsibilities in regards to "scoping, design and construction of projects" maintenance manager positions (Water OFI-14-02) Added authority for WW Operations Managers for reporting of non-compliance Minor administrative revisions throughout <i>Endorsed by the Commissioner of Public Works via authority delegated by Council.</i>	Jen Croswell
2	Mar. 28, 2019	Revisions: <ul style="list-style-type: none"> Updated position titles throughout document to reflect the Divisional reorganization (2016) and the results of the non-union job evaluation process (2016). Updated document IDs throughout document to reflect changes in document numbering system. Updated hyperlinks to supporting documents as required. Section 6 (Wastewater System Descriptions): <ul style="list-style-type: none"> Updated "Table 1: Niagara Region's Wastewater Systems" to include all Region-owned and/or operated sewage pumping stations, including assumption of ownership of Marina 1, 2, 3 stations from the City of Port Colborne. Section 9 (Organizational Structure, Roles, Responsibilities and Authorities): 	Rachel Whyte

Revision	Date	Description of Revision	Updated By
		<ul style="list-style-type: none"> Revised text (“What We Do”) and “Figure 2: Water and Wastewater Services Division – Organizational Structure” to reflect the Divisional reorganization. Added the Associate Director, Integrated Systems to Top Management as per the Divisional reorganization. Reorganized “Table 2: QMS Responsibilities and Authorities” to reflect the new organizational structure following the Divisional reorganization. Reworded Manager and Supervisor responsibilities for health and safety to “ensure staff follow safe work practices as outlined in Health and Safety procedures; provide PPE and training as needed” Minor administrative revisions and reformatting throughout document. <p><i>Operational Plan endorsed by 2018-2022 term of Regional Council.</i></p>	
3	Dec. 12, 2019	<ul style="list-style-type: none"> Specified that W-WW QM Specialist reporting to Manager, Q&C – Wastewater is the QMS Rep for the DWQMS; W-WW QM Specialist reporting to Manager, Q&C – Water is the alternate/backup Updated organizational chart and roles & responsibilities table following divisional restructuring Added AD Asset Management and W-WW Quality Management Specialist (Wastewater) roles and responsibilities Defined “Ministry” as Ministry of the Environment, Conservation, and Parks. Minor administrative revisions and reformatting throughout document. <p><i>Operational Plan endorsed by 2018-2022 term of Regional Council.</i></p>	Rachel Whyte

MEMORANDUM**PWC-C 29-2019****Subject: Municipal Councillor Appointments to Greater Niagara Circle Route Committee****Date: December 3, 2019****To: Public Works Committee****From: Ann-Marie Norio, Regional Clerk**

Staff were requested to seek municipal Councillor representatives from those municipalities identified in the Greater Niagara Circle Route Committee Terms of Reference as a first step in re-establishing the Committee.

In accordance with the Greater Niagara Circle Route Committee Terms of Reference, the following municipalities have put forward recommended appointees as noted below.

Municipality	Recommended Appointee
Town of Fort Erie	Councillor Nick Dubanow
City of Niagara Falls	Councillor Wayne Campbell
Town of Niagara-on-the-Lake	Councillor Al Bismack
City of Port Colborne	Councillor Angie Desmarais
City of St. Catharines	Councillor Dawn Dodge
City of Thorold	Mayor Terry Ugulini
Township of Wainfleet	Councillor Sherri Van Vliet
City of Welland	Councillor Lucas Spinosa

A resolution of Committee is required to approve the appointments. Suggested wording is as follows:

That Councillor Nick Dubanow (Town of Fort Erie), Councillor Wayne Campbell (City of Niagara Falls), Councillor Al Bismack (Town of Niagara-on-the-Lake), Councillor Angie Desmarais (City of Port Colborne), Councillor Dawn Dodge (City of St. Catharines), Mayor Terry Ugulini (City of Thorold), Councillor Sherri Van Vliet (Township of Wainfleet), and Councillor Lucas Spinosa (City of Welland) **BE APPOINTED** to the Greater Niagara Circle Route Committee for the remainder of this term of Council.

Staff will be scheduling a meeting of the Committee in early 2020.

Respectfully submitted and signed by

Ann-Marie Norio
Regional Clerk

Subject: GO Implementation Office Update

Report to: Public Works Committee

Report date: Tuesday, December 3, 2019

Recommendations

That this report **BE RECEIVED** for information.

Key Facts

- The purpose of this report is to provide an update on the extensive work undertaken as part of the ongoing collaborative relationship between Niagara's municipal partners and Niagara Region in relation to the expansion of daily GO Rail service to Niagara and the integration of Niagara's transit systems.
- Further to Confidential Report CSD 17-2019, additional discussions have occurred between staff at Niagara Region and Metrolinx to advance the direction provided by Council. A further in-camera report will be provided once the direction provided in CSD 17-2019 is achieved to the satisfaction of Niagara Region's CAO.
- The *Niagara Transit Governance Study* by Optimus SBR and Left Turn, Right Turn is now underway.
- The Transit App now enables Niagara riders to get real-time data for Niagara Regional Transit (NRT), St. Catharines, and Niagara Falls transit routes. Welland should be operational in Q4 2019.
- NRT now services the Meridian Community Centre in Pelham via Route 70A/75A making connections to Welland (via Niagara College) and St. Catharines (via Brock University).
- A proposal for an on-demand NRT solution for Inter-Municipal Transit (IMT) expansion to West Niagara was approved by Public Works Committee on November 5, 2019 subject to budget approval. This would fulfill the multi-year IMT service plan commitment (LNTC 21-22-23 – 2018) to provide IMT connectivity and establish transit to all 12 municipalities.

Financial Considerations

There are no financial costs directly associated with this report. Projects and activities referenced in this report have already been funded through previous capital budgets, or are subject to approval in the forthcoming 2020 budget.

Analysis

GO Rail Expansion

Service Enhancements

With the announcement of daily GO Rail service to Niagara in January 2019 four years ahead of the previously scheduled 2023 timeline, service to the St. Catharines and Niagara Falls VIA Rail stations is now established with one Lakeshore West train out in the morning and one back in the evening. Given the arrival and departure times to and from Union Station, Niagara residents are benefitting from a 'peak period' introductory service level (Metrolinx defines peak period as all trains arriving to Union Station before 9:30 a.m. and all trains departing Union station between 3:00-7:30 p.m.).

The Niagara GO CAO Working Group and GO Implementation Office continues to work closely with Metrolinx to advocate for the long term objective which is two-way, all day hourly GO service between Niagara and the GTHA.

Niagara's seasonal GO Train service was recently extended to now provide the weekend frequency year round. Three Niagara bound trains are offered, along with four Toronto bound trains every weekend as part of a significant service expansion of GO Train service for Niagara.

Negotiations with Metrolinx

In May 2019, the Niagara GO Working Group met with Metrolinx CEO Phil Verster to continue the dialogue regarding the infrastructure required for expansion, status of negotiations with CN and Metrolinx, and the active role that Niagara can play in the delivery of the station development program. This ongoing dialogue with senior leadership at Metrolinx is part of the deliberate and engaged project delivery to ensure Niagara's collective interests (Regional and Municipal) are reflected in the Metrolinx program delivery.

Further to Confidential Report CSD 17-2019, additional discussions have occurred between staff to advance the direction provided by Council. A further in-camera report will be provided once the direction provided in CSD 17-2019 is achieved to the satisfaction of Niagara Region's CAO.

At its September Board meeting, Metrolinx provided a confidential revised Niagara Initial Business Case. Staff's understanding is this document examines the revised operating,

capital, strategic and economic benefits of the expanded Niagara service and indicate the benefit cost ratio and investment costing for each aspect. Should this document become publicly released, a thorough review and report will be provided to Committee examining any recommendations, outcomes and/or alterations from the current service delivery being proposed or implemented.

Metrolinx has indicated their negotiations with CN Rail (owners of the Grimsby Subdivision, known as the Niagara Corridor) have been progressing positively. This is demonstrated by the extension of Niagara's weekend rail service to year round. Further weekday rail service improvements are part of the Metrolinx-CN negotiation. The ongoing advocacy and discussions between Niagara's GO Working Group and Metrolinx continue on this front, and the objective of two-way, all-day, hourly rail service remains the optimal service level.

In-Corridor Enabling Works (track, signals, structures)

Much of the work that Metrolinx has completed in the Niagara Corridor to date is not visible to the public because it is located below York Boulevard in Hamilton. These enabling works in Hamilton, are the necessary precursor to expanding service and frequency to Niagara beyond Hamilton.

These aspects of the enabling track work, referred to by Metrolinx as Phases 2a), 2b), and 2c) include:

- A new third track from just south of Bayview Junction into the Stuart Rail Yard
- Completion of West Harbour GO Station
- Expansion of bridges over Centennial Parkway and Desjardins Canal
- Replacement of the bridge over Valley Inn Road
- New and upgraded signals infrastructure at Bayview Junction, Hamilton Junction, Dundurn and Stuart signal plants

These critical enabling works all support the extension of service; however more work is still required. This includes increasing the track capacity to accommodate more trains without impacting efficiency of train movements through the Bayview Junction bottleneck, requiring a third track and associated signalling and track switching infrastructure between Desjardins Canal and West Harbour GO Station.

Although seemingly distant from Niagara service, these key infrastructure upgrades are directly contributing to the corridor infrastructure required to operate more service through to Niagara. A new east-end connection to the mainline track at West Harbour, scheduled for completion in 2019, will enable the existing Toronto bound trains to pass right through the station where they currently make a reverse movement to access the West Harbour platform. This will directly impact passenger journey times with an estimated 20 minute time savings once operational.

Inter-Municipal Transit

The following is a summary of highlights from the work of the Linking Niagara Transit Committee (LNTC) and Inter-Municipal Transit Working Group (IMTWG). Additional details can be found under reports submitted to the LNTC.

- Regional Council invested a 1.4% separate levy in 2019 for significant transit investments in NRT capital and operating expansion effective September 2019.
 - Allowed for the elimination of the last of the duplicated routes between local and regional services for seamless and efficient scheduling
 - Allowed for the upload of the Port Colborne and Fort Erie Link routes to the Region who now delivers all IMT routes
 - Enabled the procurement of new and replacement fleet (requiring a 12 month procurement process)
 - Ensured standardized service on the majority of NRT routes Mon-Sat from 7 a.m. to 10 p.m.
- A Universal Support Person Pass for those requiring support to ride transit is now in effect, allowing the support person to ride free with a fare-paying card holder.
- The Transit App now enables Niagara riders to get real-time data for NRT, St. Catharines, and Niagara Falls routes. Welland should be operational in Q4 2019.
- NRT now services the Meridian Community Centre in Pelham via Route 70A/75A making connections to Welland (via Niagara College) and St. Catharines (via Brock University).
- Niagara Specialized Transit (NST) has added a transfer hub in Stoney Creek, allowing NST riders to access the DARTS system in Hamilton.
- A common fare structure has been agreed to at the IMTWG and approved by the St. Catharines Transit Commission and Niagara Falls Council, pending full adoption of all parties (a necessary precursor to the introduction of common fare technology).
- The *Specialized Transit in Niagara Study* by IBI Group is nearing completion. Final recommendations will be presented to LNTC at a forthcoming meeting.
- The *Niagara Transit Governance Study* by Optimus SBR and Left Turn, Right Turn is now underway. Led by the CAO Transit Governance Working Group and reporting to the LNTC, the study's objective is to recommend a future consolidated transit model for Niagara with a suggested governance structure and a transition plan (including costs) based on a Business Case. The study is scheduled for completion with a final report with recommendations to the LNTC in late March/early April 2020.
- A proposal for an on-demand NRT solution for IMT expansion to West Niagara was approved by Public Works Committee on November 5, 2019 subject to budget approval. This would fulfill the multi-year IMT service plan commitment (LNTC 21-22-23 – 2018) to provide IMT connectivity and establish transit to all 12 municipalities.

Relationship to Council Strategic Priorities

The investment, programming and single window approach of the GO Implementation Office to advance Niagara's interests in GO Rail Expansion and Inter-Municipal Transit directly supports Council's 2019-2022 Strategic Priority of Responsible Growth and Infrastructure Planning, specifically:

Objective 3.1: Advancing Regional Transit and GO Rail Services

- Advance and advocate for Niagara's effort towards integrated and efficient conventional, specialized and higher order transit, enabling seamless and connective travel for all people throughout Niagara and the Greater Toronto and Hamilton Area (GTHA)

Objective 3.4: Facilitating the Movement of People and Goods

- Commitment to the implementation of Niagara's Transportation Master Plan, creating an integrated network of roads and highways for the movement of people and goods
- Advocate and support for Niagara's transportation projects, safe and healthy streets supporting active transportation, and opportunities in rail

Prepared by:

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Recommended and Submitted by:

Ron Tripp, P.Eng.
Acting Chief Administrative Officer /
Commissioner of Public Works

This report was prepared in consultation with Robert Salewysch, Program Manager, Transit Services; Heather Talbot, Financial and Special Projects Consultant; Cheryl Selig, Planning Lead, GO Implementation Office; and Kumar Ranjan, Transportation Lead, GO Implementation Office.

MEMORANDUM

PWC-C 28-2019

Subject: Appointment of By-law Officers for Enforcement of the Sewer-Use By-law #27-2014

Date: December 3, 2019

To: Public Works Committee

From: Jason Oatley, Manager, Quality and Compliance-Wastewater

Niagara Region enacted Sewer-use By-law #27-2014 (By-law) on February 27, 2014. The By-law contains concentration-based limits for the discharge of heavy metals, suspended solids, oil and grease, phosphorus and other parameters of concern. The By-law also contains requirements for the discharge of Hauled Sewage and storm water. The limits and requirements of the By-law are designed to protect the wastewater collection system and sewage treatment plant infrastructure and to protect the wastewater treatment plant processes to maintain environmental compliance.

The purpose of this memorandum is to request approval from Regional Council for the appointment of individuals involved in administration and enforcement of the By-law as listed below. Individuals responsible for the administration and enforcement of this By-law require Council approval to be duly authorized as by-law enforcement officers and Provincial Offences Officers.

Under Section 87 of the Municipal Act, 2001, A municipality may enter on land, at reasonable times, to inspect the discharge of any matter into the sewage system of the municipality or into any other sewage system the contents of which ultimately empty into the municipal sewage system and may conduct tests and take samples for this purpose.

Under Section 3.1 of Niagara Region By-law, 27-2014, Regional Council may enact a by-law appointing enforcement officers for the purpose of the enforcement of this By-law as required.

As a result of staffing changes in the Environmental Enforcement Section of the Water and Wastewater Division, staff is requesting the required by-law be enacted to appoint specific individuals to enforce the Bylaw.

The following list of individuals are employees of the Corporation that have been trained and are qualified for the enforcement of the By-law:

- Jason Oatley, Manager, Quality and Compliance (Wastewater) - Previously Appointed
- Dominic Valentini, Environmental Enforcement Officer- Previously Appointed

- Craig Burns, Environmental Enforcement Officer – Previously Appointed
- Ashley Marshall, Environmental Enforcement Officer – New Appointment
- Chris Brylinski, Environmental Enforcement Officer – New Appointment

It is therefore recommended that these individuals be appointed as by-law enforcement officers and Provincial Offences Officers and included in a by-law as appropriate.

Respectfully submitted and signed by

Jason Oatley, B.Sc., C.Chem.
Manager, Quality and Compliance -Wastewater