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

Niagara //⚡ Region

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

- 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

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 Standard[1], "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

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[1] Updates made under Version 2.0 (February 2017).

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

- 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.)

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.	---

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Finding	DWQMS Standard Element	Number
Element 5:	**Document and Records Control**	
NC	*Document and Records Control (QMS-WT-ALL-P-050, rev7, 8Feb2017)* 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: • *ERP Contact List (ERP-ALL-ALL-T-002)*: Current is Jan 2019, binders contain versions from Jan2017 or Dec2017. • *Threat to a Water or Wastewater Facility, System, or Supply (ERP-ALL-ALL-P-002)*: Current version is rev2 (24Oct2017), binders contain rev1. • *Watermain Break (ERP-WT-ALL-P-011)*: current version is rev3 (22Aug2018), binders contain rev2. • *Watermain Break Repair (OP-WT-ALL-P-033)*: current version is rev1 (22Aug2018), binders contain rev0. • *Emergency Laboratory Services for Non-Bacteriological Sampling (OP-WT-ALL-P-014)*: current version is rev6 (23Jul2018), binders contain rev5.	[WTCAR-19-001](#)
NC	*Water and Wastewater Emergency Response Plan (ERP-ALL-ALL-P-001, rev 1, 27Jan2017)* 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.	[WTCAR-19-002](#)
PNC	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.	[2019-001-Audit Internal](#)
BP	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.	[2019-002-Audit Internal](#)

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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	*Not reviewed during this internal audit.*	---
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	*Not reviewed during this internal audit.*	---
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	*Water and Wastewater Emergency Response Plan (ERP-ALL-ALL-P-001, rev 1, 27Jan2017)* 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

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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	*Not reviewed during this internal audit.*	---

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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 *Preventive Maintenance Program Optimization* 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 *Maintenance (QMS-WT-ALL-P-150, rev5)* 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

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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

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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 *Internal Auditing (QMS-WT-ALL-P-190, rev7, 26Jul2018)* 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

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Finding	DWQMS Standard Element	Number
Element 20: Management Review		
N/A	*Not reviewed during this internal audit.*	--
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	Issues were identified with the documented procedure for this element: • Section 5.1.3 of *Corrective Action, Preventive Action, and Best Practices (QMS-WT-ALL-P-210, rev7, 27Jul2018)* 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 *Corrective Action, Preventive Action, and Best Practices (QMS-WT-ALL-P-210, rev7, 27Jul2018)* 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 *Corrective Action, Preventive Action, and Best Practices (QMS-WT-ALL-P-210, rev7, 27Jul2018)* 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)