

CITY OF HAMILTON'S DRINKING WATER SYSTEMS
DWQMS SUMMARY REPORT



2018

Safe Drinking Water Act

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A close-up photograph of a stainless steel mesh strainer held over a pot of boiling water. Several pieces of bright green broccoli are being cooked in the strainer. A pair of metal tongs with serrated ends is positioned to lift one of the broccoli florets. The background shows the bubbling water in the pot.

1 - INTRODUCTION

1.1 Purpose

This Drinking Water Quality Management System (DWQMS) Summary Report is being submitted to the Owner, (Mayor and Council) on behalf of Top Management (General Manager, Public Works and Director of Hamilton Water) of the City's five drinking water systems (DWS), as shown below.

Licence Number	Drinking Water System
005-101	Hamilton DWS
005-102	Freelton DWS
005-103	Greensville DWS
005-104	Carlisle DWS
005-105	Lynden DWS

The purpose of this DWQMS Summary Report is to keep the Owner of the City's DWS informed about the ongoing performance of the DWQMS, including major milestones achieved in 2018. This report also assists the Owner in meeting their Standard of Care responsibilities under the Safe Drinking Water Act (SDWA).

This DWQMS Summary Report is a key communication tool from Top Management to the Owner as referenced in Element 12 Communications of the DWQMS Standard. This Report also meets the communication requirements of Element 14 Review and Provision of Infrastructure and Element 20 Management Review of the DWQMS Standard as identified in Sections 3 and 5 of this report, respectively.

1.2 Scope

The DWQMS Standard requires that the Operating Authority report on certain aspects of the DWQMS to the Owner, specifically the outcomes of Element 14 Review and Provision of Infrastructure and Element 20 Management Review. This report fulfills the communication requirements of these elements and exceeds the Standard’s requirements by providing information on external and internal DWQMS Audits, Risk Assessment and other major milestones of the DWQMS for 2018.

1.3 Overview of Key Milestones

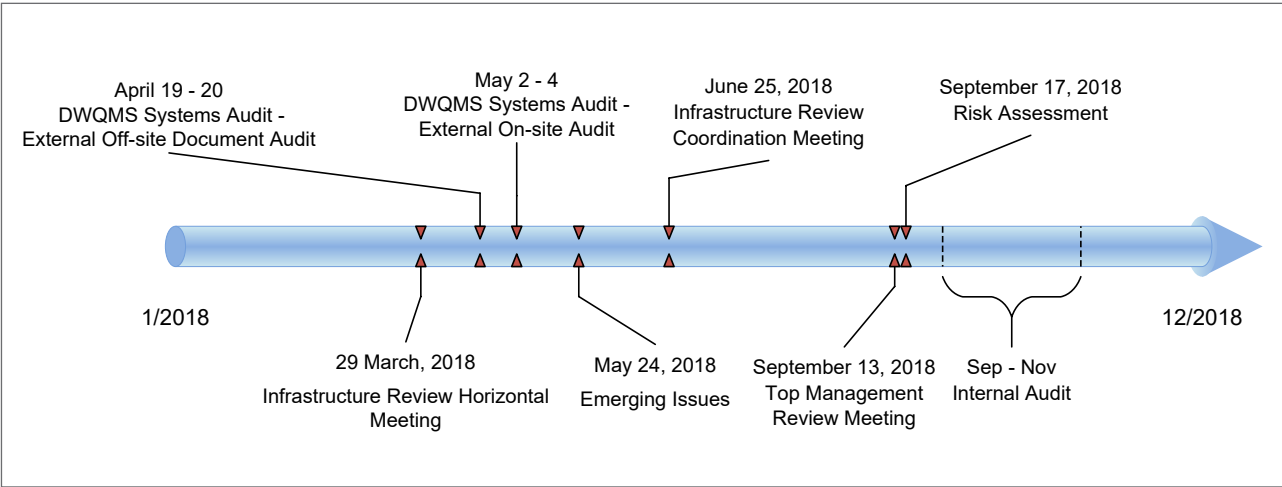
DWQMS milestones related to the accreditation of Hamilton Water, the City’s Operating Authority are described below:

- November 2008 – DWQMS Operational Plan endorsed by Owners,
- April 2009 – Operating Authority achieves Partial Scope; Entire DWQMS accreditation,
- June 2009 – Operating Authority receives Municipal Drinking Water Licences and Drinking Water Works Permits for all five City DWsS,
- February 2011 – On-site Verification Audit by

- Canadian General Standards Board (CGSB),
- July 2011 – Operating Authority achieves Full Scope; Entire DWQMS accreditation,
- 2012 – Identified QMI - SAI Global as the new Accreditation Body,
- 2012 – Standard of Care Training for Mayor and Council,
- May 2013 – External Systems Audit (off-site document review),
- June 2013 – Operating Authority receives reaccreditation,
- May 2014 – External Systems Audit (off-site document review),
- June 2014 – Received renewed Municipal Drinking Water System Licences for each of the City’s five DWsS,
- First quarter 2015 – re-endorsement of the DWQMS Operational Plan by Owners,
- March (off-site document review) and April (on-site audit) 2015 – re-accreditation of the DWQMS by external registrar, SAI-Global,
- May 2016 – External Systems Audit (off-site document review),
- May 2016 – Standard of Care Training for Acting General Manager and new Councillor,
- May 2017 – External Systems Audit (off-site document review).
- April (off-site document review) and May (on-site audit) 2018 – re-accreditation of the DWQMS by external registrar, SAI-Global

Figure 1-1 illustrates key DWQMS milestones which occurred in 2018:

Figure 1-1: Project Pipeline - 2018



1.4 DWQMS Operational Summary

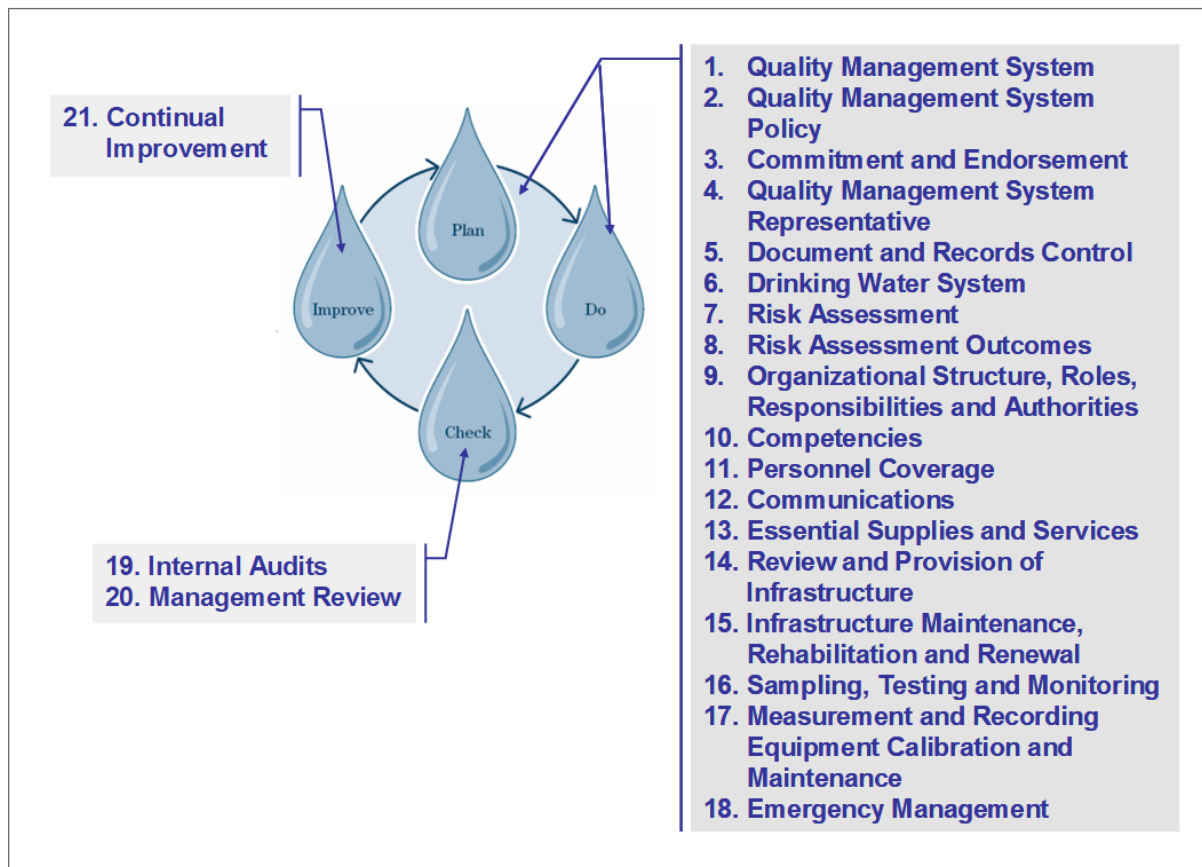
Figure 1-2 illustrates the Plan, Do, Check and Act elements of the DWQMS Standard. In 2018, the Ministry of the Environment and Climate Change revised the Standard and issued V 2.0.

The following sections of this report include an overview of milestones related to the following

elements of the DWQMS:

- Section 2 - Element 8 Risk Assessment Outcomes
- Section 3 - Element 14 Review and Provision of Infrastructure
- Section 4 - Element 19 Internal Audits
- Section 5 - Element 20 Management Review

Figure 1-2: DWQMS Standard Elements



DWS Licences & Permits Approvals

In 2018, Licence renewal applications were submitted for each of our Drinking Water Systems. They will each be renewed in 2019. In addition, there were 14 approvals for extensions to the distribution system; 4 approvals for like for like infrastructure replacements (e.g. pumps); and 1 approval for a new 1200mm diameter trunk watermain in part of the Red Hill Area.



2 RISK ASSESSMENT

2.1 Overview

The DWQMS Standard requires that a Risk Assessment be conducted in its entirety every three years and reviewed on an annual basis, to verify the currency and validity of the information. An interim review of the Risk Assessment scope, criteria, data fields and update of Risk Assessment Outcomes was conducted in 2018.

Staff from across Hamilton Water collaborated on updating the existing information considering the following key questions:

- Are identified control measures still valid and if so, are they still in place?
- Have additional controls been implemented?
- How has equipment condition, raw water quality, operational controls etc. changed?
- Are any modified “Risk Factors” now considered to be Critical Control Risks?

Similar to previous years, there were no significant risks identified through the 2018 process, which were not already captured through an existing Hamilton Water initiative or project.

2.2 Key Updates

As part of the Risk Assessment, process changes, including capital upgrades in the DWSs, are considered and the associated risk scores (i.e. likelihood of occurrence) are updated as needed. The following includes a list of materials that were considered in the 2018 Risk Assessment:

- Capital Delivery - Water Projects Recently completed and upcoming
- 2018 DWQMS Infrastructure Review outcomes
- Critical Control Point Summary Chart PW-WW-R-032-009 (Outcomes updated from previous DWQMS Risk Assessment)
- DWQMS Risk Assessment - Water Distribution Report PW-WW-R-032-012 (Outcomes updated from previous DWQMS RA)
- Review of Adverse Water Quality Incident Notifications
- BCOS Database Quality Non-conformance Module (audits and inspections)

- 2018 Emerging Issues Meeting outcomes
- Critical Control Point Summary - Woodward DWS PW-WW-L-032-005
- DWQMS Risk Assessment - Water Treatment Plant Report PW-WW-R-032-010 (Outcomes updated from previous DWQMS Risk Assessment)
- Critical Control Point Summary - Wells & Fifty Road DWS PW-WW-L-032-005
- DWQMS Risk Assessment - Wells Systems Report PW-WW-R-032-011 (Outcomes updated from previous DWQMS RA)
- Items from recent DWQMS Top Management Review Meeting
- Review and consideration of the MECP’s “Potential Hazardous Events for Municipal Residential Drinking Water Systems”

In 2019, a scoped review of the Risk Assessment will be completed. Staff will continue to work to better integrate the DWQMS Risk Assessment with existing Hamilton Water budget processes in an effort to streamline where possible.



3 REVIEW AND PROVISION OF INFRASTRUCTURE

3.1 Purpose

The Operating Authority must ensure and verify, on an annual basis, the adequacy of water infrastructure. In order to satisfy the requirements of the DWQMS Standard, the Operating Authority conducted a formal review of its vertical (water treatment, storage and pumping) and horizontal (watermains) infrastructure. The scope of the review also considered the operation, maintenance and replacement of existing infrastructure assets as well as new infrastructure planned for the immediate and long-term future. A Coordination Meeting was held with the Management Team of Hamilton Water

to discuss the outcomes of both the horizontal and vertical infrastructure reviews. This DWQMS Summary Report (2018) includes a brief summary of the results of the DWQMS Infrastructure Review.

3.2 Process

Teams were assembled from across relevant sections of Hamilton Water, Engineering Services and Planning and Economic Development to conduct the review of water infrastructure. Meetings were held in March 2018 to discuss vertical and horizontal infrastructure and a coordination meeting was held in June 2018. The teams collected and examined input data related to various asset management, maintenance and capital programs. A summary of the type of “indicator” data examined is provided below:

Infrastructure Type	Input Data
Horizontal Infrastructure – Maintenance	→ Watermain Repairs Hydrant and Valve Inspections Valve and Meter Replacement Substandard Service Replacement Preventative Maintenance Emergency Repairs Customer Complaints
Horizontal Infrastructure - Large Capital	→ Replaced, Rehabilitated and New Watermains Condition Assessments Capital Upgrades Master Plan Schedule Corrosion Control Program and Corrosion Control Building Asset Management – Critical Watermain Age Profiles and Inspections
Vertical Infrastructure – Maintenance	→ Preventative Maintenance Program Status Breakdowns and Emergency Repairs Capital Upgrades - Coordination and Scheduling Life Cycle Best Practices Critical Projects
Vertical Infrastructure – Large Capital	→ Condition Assessments Master Plan Update Source Water Protection Projects, Well Studies and Investigations Water Capital Projects Lists

3.3 Overview of Results

The outcomes and recommendations from the Infrastructure Review Meetings are documented in meeting minutes for the 2018 review. Attendees at the Infrastructure Review Coordination meeting utilized the outcomes from the meeting as input to capital planning and budget preparation. Hamilton Water discussed the 2018 Infrastructure Review at the Top Management Review meeting on September 13, 2018.

The 2018 Infrastructure Review concluded that vertical and horizontal infrastructure is generally found to be available when needed. There is concern however about resources needed to perform preventative maintenance and move forward with required station upgrades. It was acknowledged that life-cycle replacement funds were being used for emergency or short-term work. This results in a budget shortfall for long-term replacement and maintenance activities. There is work ongoing to confirm that current and projected spending allocations are adequate for drinking water.



4 DWQMS AUDITS

The DWQMS accreditation process requires both 3rd party accreditation audits and annual internal audits by the Operating Authority. The cycle of external audits includes an on-site verification audit every 3 years and systems audit or documentation review annually.

4.1 External DWQMS Audits

Hamilton Water utilizes the services of QMI-SAI Global as the accreditation body for the DWQMS. In 2018, QMI-SAI Global conducted an off-site audit and an on-site re-accreditation audit. There were no non-conformances or opportunities for improvement found.

4.2 Internal DWQMS Audit

The Operating Authority must conduct internal audits to evaluate the conformity of the DWQMS with the requirements of the DWQMS Standard and its procedures, at least annually.

The results of the annual DWQMS Internal Audit conducted in October/November 2018 demonstrate that the City of Hamilton's DWQMS is a mature system and that opportunities to improve the DWQMS continue to be identified to ensure that the system is relevant and appropriate for HW. The HW DWQMS contains the required procedures and records to illustrate the establishment and continual improvement of the management system.

The highest number of findings were related to Element 5 – Document and Records Control. This coincides closely with the findings by the external auditor, SAI-Global, for audits that they have conducted on other municipalities in Ontario.

Our high risk findings that remain open from previous audits, were related to:

- Element 15 – Infrastructure Maintenance, Rehabilitation and Renewal
- Element 17 – Measurement and Recording Equipment Calibration and Maintenance

These findings are closely connected to compliance requirements.

The findings identified in this audit will be assigned for further investigation and corrective/preventive actions.

In conclusion, with the timely completion of the corrective actions issued as a result of this audit, the overall conformance to V2.0 of the DWQMS Standard and the City of Hamilton's DWQMS is suitable, the audit process is adequate, and the implementation and maintenance effective.

2019 DWQMS Audit Plan

The Compliance Support Group of the Compliance & Regulations Section will be developing an Audit Plan for the 2019 DWQMS internal audits. The Audit Plan will be reviewed and approved by the Hamilton Water Senior Management Team prior to implementation.



5 MANAGEMENT REVIEW

The PLAN component of Element 20 Management Review of the DWQMS Standard requires a documented procedure to describe how the Operating Authority reviews the suitability, adequacy and effectiveness of the DWQMS. The 'CHECK' component of the element requires that Top Management participate in a management review at least once per year to review the DWQMS and consider recommendations for continual improvement. Required outputs of the meeting are:

- Consideration of the results of the management review and identifying deficiencies and action items

- to address deficiencies,
- Provide a record of decisions and actions items including responsibilities and timelines,
- Report the results of the management review to the Owner.

In 2018, the DWQMS Top Management Review (TMR) was held on September 13th. Attendees included Top Management (General Manager of Public Works and Director of Hamilton Water), Directors, Section Managers, Overall Responsible Operators (OROs) for treatment and distribution, the System Management Representative and staff from the Compliance Support Group.

Table 5-1: Management Review Action Items

No.	Summary of Action Items	Status
1	A meeting is to be scheduled to discuss setting the rate. A risk assessment to be held following the submission of the Blue Plan Report.	Pending
2	Hamilton Water to continue to provide information to the residents of Lynden regarding the new well.	Pending
3	Include a record of continual improvement training at the 2019 Top Management Meeting.	Pending

Overall, Top Management, Directors and Section Managers concluded that the DWQMS is suitable, adequate and effective.

Financial Plan

The need to prepare a Water Infrastructure Financial Plan is, in part, a regulatory compliance issue specific to the water licensing requirements defined within the DWQMS and more specifically detailed under Regulation 453/07 - Financial Plans made under the Safe Drinking Water Act, 2002. The required Financial Plan for water systems must address a minimum six-year time-frame and be approved

by council prior to submission to the Province of Ontario. The resulting plans must also be made freely available to the general public. Water Infrastructure Financial Plans for Hamilton have typically been developed to cover a ten-year period of time in order to reflect consistency with the current rate budget process.

The first Financial Plan was created in 2010 and revised in 2014. The latest revision was approved by Council on July 12, 2018. This most current plan was sent to the Ministry of Municipal Affairs and Housing on November 22, 2018.

6 CONCLUSIONS

The outcomes from the internal DWQMS audit and the Management Review concluded that the DWQMS is adequate, suitable and effective and conforms to the requirements of the DWQMS Standard. Corrective action plans from the audit and action items from the Management Review will be implemented to ensure continual improvement of the DWQMS.

7 NEXT STEPS – TIMELINE

The management system requires ongoing commitment by staff and management. Maintenance and improvement of the system continues to be a high priority of the Operating Authority. Major next steps related to the maintenance of the DWQMS in 2019 include the following:

Month of 2019	Scheduled DWQMS Milestones
January to July	→ Investigate and correct internal audit findings from DWQMS Internal Audits
February/March	→ Annual O.Reg. 170 Schedule 22 Report and DWQMS Summary Report to Council
Throughout 2019	→ DWQMS Internal Audits
March	→ Hamilton Water - SMT Meeting #1
April	→ DWQMS Risk Assessment Meetings
April/May	→ DWQMS 3rd Party Surveillance off-site Documentation Audit
May	→ Infrastructure Review Meetings
June	→ Hamilton Water - SMT Meeting # 2
September	→ DWQMS Top Management Review
December	→ Hamilton Water - SMT Meeting # 3

