

**2021**  
CITY OF HAMILTON

# WASTEWATER QUALITY MANAGEMENT SYSTEM ANNUAL SUMMARY



Hamilton

# WASTEWATER QUALITY MANAGEMENT SYSTEM [WWQMS]

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# WASTEWATER QUALITY MANAGEMENT SYSTEM POLICY



*The City of Hamilton owns, maintains and operates various wastewater systems. The City is committed to:*

**C**

*Compliance with all legal and other requirements*

**L**

*Leaders in pollution prevention*

**E**

*Effective Communication with the community*

**A**

*Always improving the Wastewater Quality Management System*

**N**

*Noteworthy innovation*



# 1. INTRODUCTION

## 1.1 PURPOSE

This Wastewater Quality Management System (WWQMS) Annual Summary Report is being submitted to the Owner, (Mayor and Council) on behalf of Top Management (General Manager, Public Works and Acting Director of Hamilton Water) of the City of Hamilton's Wastewater System (WWS).

The purpose of this WWQMS Annual Summary Report is to keep the Owner of the City's WWS informed about the performance of the WWQMS, including major milestones achieved in 2021.

This WWQMS Annual Summary Report provides an update from Top Management to the Owner as required by Element 12 Communications of the WWQMS Operational Plan Summary Report (City's Voluntary WWQMS Standard). It also meets the communication requirements of the WWQMS Standard for Element 14 Evaluation of Compliance, Element 15 Review and Provision of Infrastructure, and Element 21 Management Review as identified in Sections 4, 5 and 7 respectively.

## 1.2 SCOPE

The WWQMS Standard requires that the Operating Authority report on certain aspects of the WWQMS to the Owner, specifically the outcomes of Element 14 Evaluation of Compliance, Element 15 Review and Provision of Infrastructure, and Element 21 Management Review. This report fulfills the communication requirements of these elements and exceeds the Standard's requirements by providing information on Environmental Aspects and Impacts, Objectives and Targets, WWQMS Audits, and other major milestones of the WWQMS for 2021.

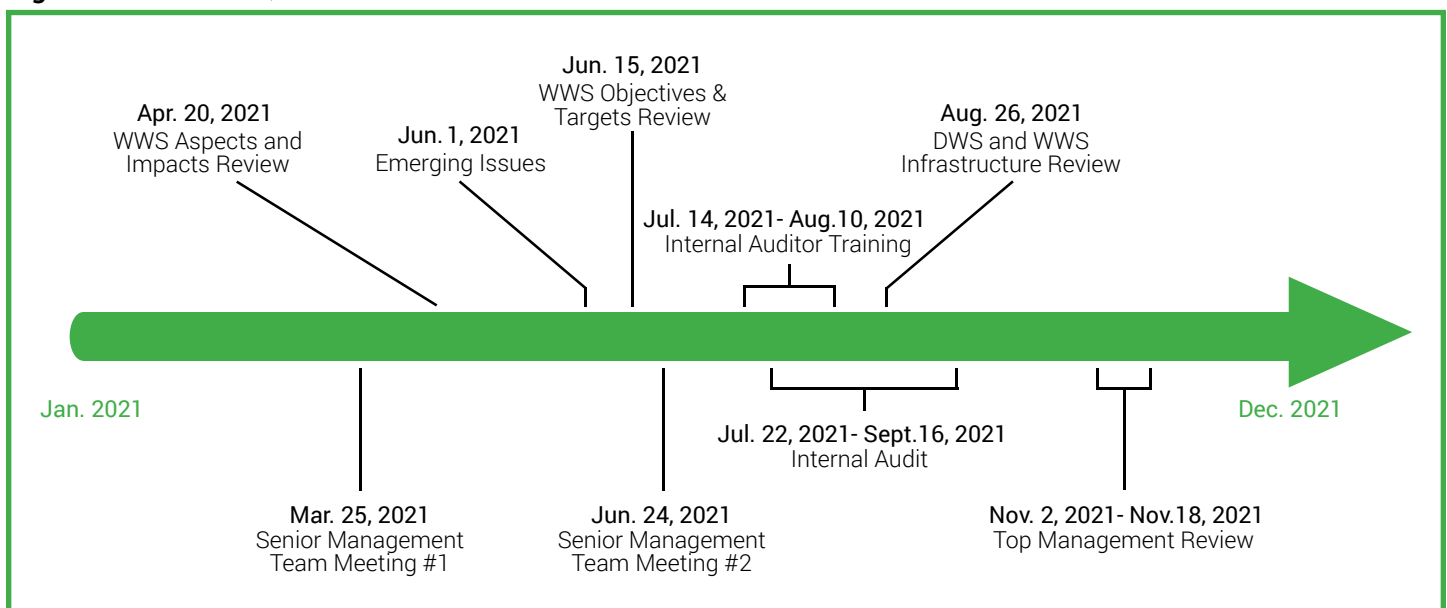
## 1.3 OVERVIEW OF KEY MILESTONES

On December 16, 2020, the WWQMS Operational Plan was endorsed by Council through Report PW20076. Following the endorsement, the WWQMS Operational Plan was posted on the City's website and made available to the Public at 330 Wentworth Street North and City Hall. More information about the WWQMS Operational Plan, WWQMS Policy CLEAN, WWQMS Annual Summary Report, Wastewater Treatment Facilities Annual Report, Hamilton Water Financial Plan etc. is now available on the City's website:

[www.hamilton.ca/home-property-and-development/water-sewer/wastewater-collection-treatment](http://www.hamilton.ca/home-property-and-development/water-sewer/wastewater-collection-treatment)

Figure 1 illustrates key WWQMS milestones which occurred in 2021.

**Figure 1: 2021 WWQMS Milestones**



## 1.4 WWQMS OPERATIONAL SUMMARY

Figure 2 illustrates the Plan, Do, Check, and Act elements of the WWQMS Standard that were voluntarily developed and adopted by the City. The following sections of this report include these elements of the WWQMS:

Section 2 – Element 7 Environmental Aspects and Impacts

Section 3 – Element 8 Objectives and Targets

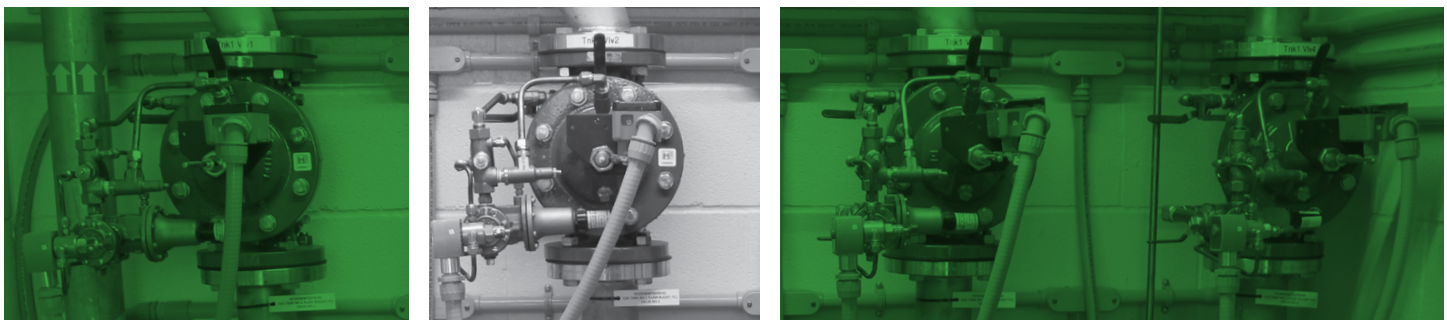
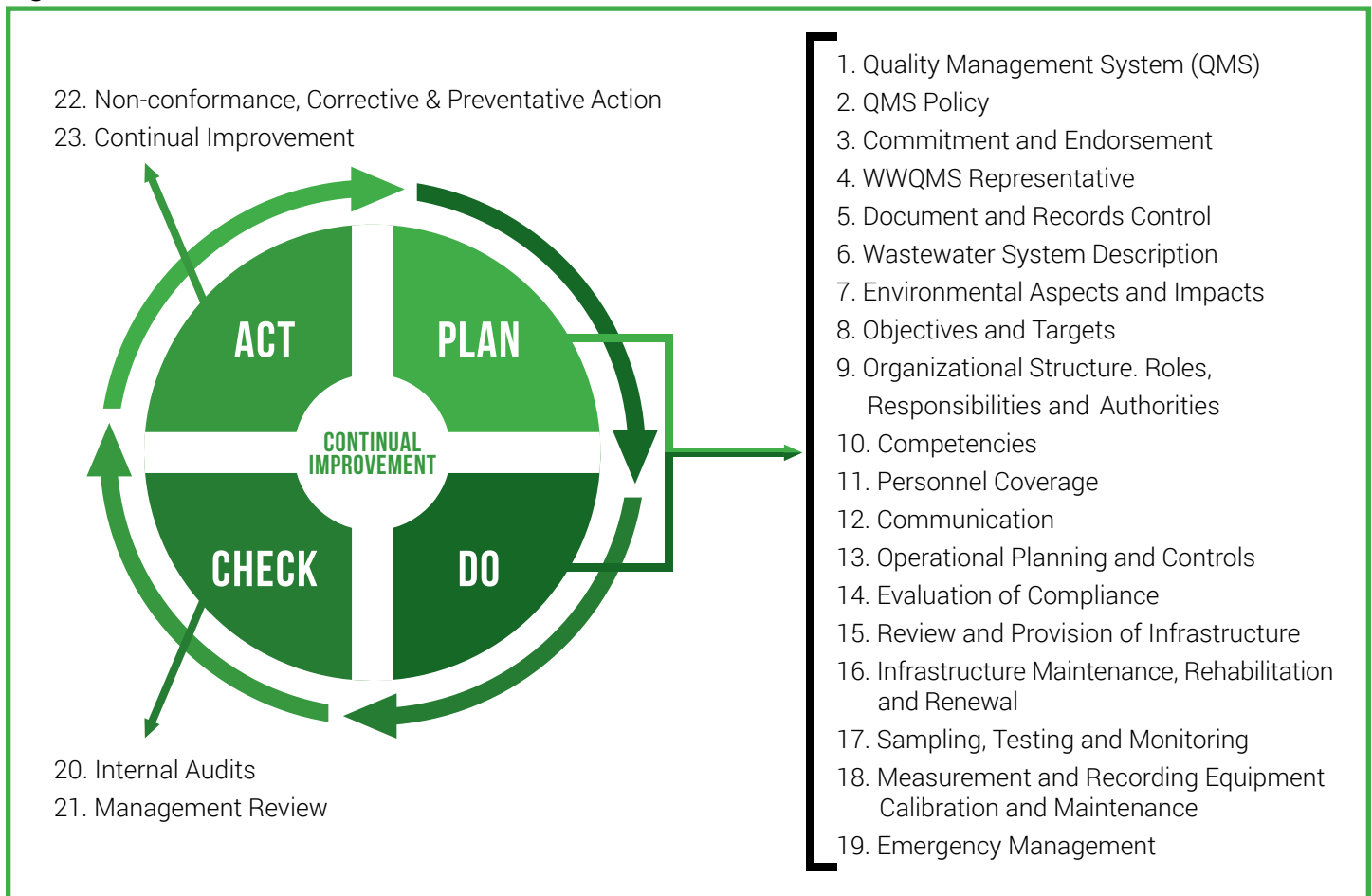
Section 4 – Element 14 Evaluation of Compliance

Section 5 – Element 15 Review and Provision of Infrastructure

Section 6 – Element 20 Internal Audits

Section 7 – Element 21 Management Review

**Figure 2: WWQMS Standard Elements**





## 1.5 LEGAL AND OTHER REQUIREMENTS

In 2021, two Environmental Compliance Approvals (ECAs) for pumping stations were received, four pumping stations were brought into service and the construction for Contracts 1 and 2 of the Woodward Upgrades Project were extended until June 30, 2022.

No Ministry of the Environment, Conservation and Parks (MECP) inspections for wastewater were conducted in 2021. All legal reports were submitted by the required deadlines.

In 2021, there was one self-declared non-compliance to the MECP for a missing logbook at a wastewater pumping station. Immediate corrections were made and corrective actions to address this finding are being implemented.

The MECP will be replacing site specific ECAs with one Consolidated Linear Infrastructure Environmental Compliance Approval (CLI ECA) for sanitary and one for stormwater collection system. The City of Hamilton was invited to apply for the approvals on August 06, 2021. The applications were submitted by the deadline of January 21, 2022. Under the consolidated approval process, low risk routine projects that meet design criteria and other ministry approved conditions may be reviewed internally and pre-authorized.

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## 2. ENVIRONMENTAL ASPECTS AND IMPACTS

### 2.1 OVERVIEW

The WWQMS Standard requires that an Environmental Aspects and Impacts Assessment be conducted in its entirety every three years and reviewed on an annual basis to verify the currency and validity of the information. In 2020, the Environmental Aspects and Impacts Assessment was conducted in its entirety. In 2021, an interim review was conducted.

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

- Have there been any major process changes that affected existing environmental aspects or created new aspects?
- Are identified operational control measures still valid?
- Have additional controls been implemented?
- Were there any changes to aspects identified as "Significant?"

In 2020, eight significant environmental aspects of the WWS were identified:

- Hazard waste disposal in sanitary and combined sewers leading to sewer damage
- Pumping station failure causing spill / bypass / overflow
- Major sanitary and combined sewer breaks causing spill
- Insufficient infrastructure in wastewater treatment plant and sanitary / combined sewers causing spill / bypass / overflow
- Cross connections in sanitary and combined sewers causing combined overflow
- Uncontrolled combined sewer overflows
- Interceptor sewer failure causing spill / bypass / overflow
- Inaccessibility to maintain infrastructure causing spill / bypass / overflow

There were no changes to the significant aspects identified through the 2021 process.

## 2.2 KEY UPDATES

As part of the Environmental Aspects and Impacts Assessment, process changes, including capital upgrades in the WWSSs, are considered and the associated ratings (i.e. likelihood of occurrence, severity of impacts and their detectability) are updated as needed. The following includes a list of materials that were considered in the 2021 Assessment:

- Instances of wastewater incidents and complaints
- Changes in wastewater system capacity due to upgrades to pumping stations
- Compromised security at pumping stations and the Woodward Wastewater Treatment Plant (Woodward WWTP)
- Upgrades to the Woodward WWTP
- Upgrades to the Dundas WWTP
- Bypasses at the treatment plants and overflows of CSO tanks

In 2023, a review of the Environmental Aspects and Impacts Assessment process and outcomes will be completed in accordance with the Standard. Hamilton Water staff continue to work to integrate the WWQMS Environmental Aspects and Impacts Assessment with the City's Asset Management risk assessment in accordance with Ontario Regulation 588/17: Asset Management Planning for Municipal Infrastructure that came into effect on January 1, 2018. The WWQMS Environmental Aspects and Impacts Assessment and Infrastructure Review will be updated to incorporate any new related processes or requirements.

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## 3. OBJECTIVES AND TARGETS

### 3.1 OVERVIEW

The WWQMS Standard requires that Objectives and Targets be established to avoid or minimize environmental impacts from the City's WWS. In 2020, the Objectives and Targets were approved based on evaluation criteria identified in the WWQMS Standard. The following is the list of evaluation criteria:

- Significant aspects
- WWQMS policy
- Compliance obligations
- Technological options
- Financial, operational, and business requirement
- Views of interested parties
- Preventative measures
- Audit results

The Objectives are:

- To minimize discharges to the environment
- To regulate the quality of wastewater received from Industrial Commercial and Institutional (ICI) properties
- To meet all ECA and Hamilton Harbour Remedial Action Plan (HHRAP) requirements for final effluent quality for the Dundas and Woodward WWTPs

The Objectives and Targets are reviewed and updated annually.

Management Programmes have been established to meet the Objectives and Targets. Updates to the Management Programmes are made throughout the year to add any new projects or reflect changes in project status.



## 3.2 KEY UPDATES

Objectives were reviewed in 2021 to ensure that they were still appropriate based on evaluation criteria outlined in the WWQMS Standard. No changes were made to the three Objectives for the City's WWS.

In 2021, the City's performance to targets was reviewed. The following are the outcomes of the review of targets:

- F-5-5 requirements were met in 2020 (i.e. over 90% of wet weather flow was captured; primary level of treatment was achieved for carbonaceous biochemical oxygen demand (BOD) and total suspended solids (TSS) removal in combined flows above the dry weather flow). There were, however, two primary bypasses from the Woodward WWTP in 2021.
- 79% ICI permits were processed within 90 days. 9 permits expired without new permit in place. 84% NOV's were sent within 3 weeks of being posted. 426 properties were assessed.
- Woodward and Dundas were in 100% compliance with their ECAs. However, HHRAP limits for TP and TKN were not met.

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## 4. EVALUATION OF COMPLIANCE

### 4.1 EXTERNAL WWS COMPLIANCE AUDIT

The Operating Authority voluntarily retained the services of Wood PLC in March 2020 to evaluate the compliance of the WWS with legal and other requirements. Due to the COVID-19 pandemic, the audit was conducted off-site virtually. There were ten non-compliances, nine recommendations and four best practices identified.

### 4.2 STATUS OF FINDINGS

Of the ten findings from the 2020 audit, four were closed in 2020 and six remained open in 2021. The recommendations and best practices were considered for future action as required.

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## 5. REVIEW AND PROVISIONS OF INFRASTRUCTURE

### 5.1 PURPOSE

The Operating Authority must ensure and verify, on an annual basis, the adequacy of the wastewater infrastructure. In order to satisfy the requirements of the WWQMS Standard, the Operating Authority conducted a formal review of its vertical (wastewater treatment, storage and pumping) and horizontal (wastewater collection pipes, regulators, etc.) 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 WWQMS Summary Report (2021) includes a brief summary of the results of the WWQMS Infrastructure Review.

## 5.2 PROCESS

Teams were assembled from across relevant sections of Hamilton Water, Engineering Services and Planning and Economic Development (P&ED) to conduct the review of wastewater infrastructure. A Coordination Meeting was held on August 26, 2021 to discuss the adequacy of vertical and horizontal wastewater infrastructure.

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	<ul style="list-style-type: none"> <li>Linear Sewer Inspections and Condition Assessments including Sewer Age Profiles, CCTV, CIPP Lining</li> <li>Wastewater Collection Maintenance Program</li> <li>Sewer Maintenance, Repair and Replacement Program</li> <li>Sewer Flushing Program</li> <li>Inspection Programs – Manhole, Sewer Boom, Combined Sewer Regulators, Air Valve, Combined Sewer Outfall, Sewer Lateral Backup</li> <li>Sewer Lateral Management Program</li> <li>Mainline Sewer Blockages</li> </ul>
Horizontal Infrastructure Capital	<ul style="list-style-type: none"> <li>Capital Maintenance Projects</li> <li>Mainline Sewer Rehabilitation Projects</li> <li>Asset Management Plan Updates</li> <li>Master Plan Updates</li> </ul>
Vertical Infrastructure Maintenance	<ul style="list-style-type: none"> <li>Preventative Maintenance Program</li> <li>Inspection Programs by Enhanced City of Hamilton Outstations Team</li> </ul>
Vertical Infrastructure Capital	<ul style="list-style-type: none"> <li>Large Capital Projects</li> <li>Condition Assessment</li> <li>Asset Management Plan Updates</li> <li>Master Plan Updates</li> </ul>

## 5.3 OVERVIEW OF RESULTS

The outcomes and recommendations from the Infrastructure Review Meeting were documented in meeting minutes for the 2021 review. Attendees at the Infrastructure Review meeting utilized the outcomes from the meeting as input to capital planning and budget preparation. Hamilton Water discussed the 2021 Infrastructure Review at the Top Management Review meetings on November 2 and 18, 2021.

The 2021 Infrastructure Review process concluded that our vertical and horizontal infrastructure is generally found to be adequate and available when needed. It was also found, however, that we are not keeping up with required renewals and replacements of our aging infrastructure. This results in an increased demand on maintenance staff and resources as assets remain in operation beyond their intended life cycle.

## 6. WWQMS AUDITS

### 6.1 INTERNAL WWQMS AUDITS

The Operating Authority must conduct annual internal audits to evaluate the conformity of the WWS with the requirements of the WWQMS Standard and its procedures. The first internal WWQMS audit was conducted in 2021. The elemental audit was conducted virtually due to the COVID-19 pandemic.

The results of the annual WWQMS Internal Audit conducted throughout 2021 demonstrated that the City's WWQMS contains the required procedures and records to illustrate the establishment and continual improvement of the management system.

Because the WWQMS was not fully implemented in 2020 there were findings in the 2021 audit regarding incomplete records (e.g. there was no internal audit in 2020, the 2020 WWQMS Top Management Review (TMR) did not review all of the required inputs that was to include the results on an internal audit). With the completion of the 2021 Internal Audit and 2021 TMR, these findings have been addressed. There were a number of findings related to Document and Record control as documents were being updated to meet the requirements of the WWQMS and reflect current processes. There were no major findings found during this audit.

With the timely completion of the corrective actions issued as a result of this audit, the overall conformance to the WWQMS Standard and the City's WWQMS is suitable, the audit process is adequate, and the implementation and maintenance effective.

### 6.2 2022 WWQMS AUDIT PLAN

The Compliance Support Group of the Compliance & Regulations Section has developed an Audit Plan for the 2022 WWQMS Internal Audit. The audit is to take place between March and July 2022. In 2022, the elemental WWQMS audit will be integrated with Drinking Water Quality Management System (DWQMS) audit when possible. The Audit Plan was reviewed by the Hamilton Water Senior Management Team and approved by the Systems Management Representative prior to implementation.





## 7. MANAGEMENT REVIEW

The “Plan” component of Element 21 Management Review of the WWQMS Standard requires a documented procedure to describe how the Operating Authority reviews the suitability, adequacy and effectiveness of the WWQMS. The “Check” component of the element requires that Top Management participate in a management review at least once per year to review the WWQMS 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 2021, the WWQMS Top Management Review (TMR) was held on November 02 and 18, 2021. Attendees included Top Management (General Manager of Public Works and Acting Director of Hamilton Water), Directors, Section Managers, Overall Responsible Operators (OROs) for collection and treatment, the System Management Representative and staff from the Compliance Support Group.

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

Action Items were assigned following the 2021 WWQMS Top Management Review that will result in operational improvements, improved communication and better coordination between Hamilton Water and other City departments.



## 8. CONCLUSIONS

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

## 9. NEXT STEPS

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 milestones related to the maintenance of the WWQMS in 2021 are detailed in [Figure 3](#).

**Figure 3: 2022 WWQMS Milestones**

