

TERTIARY
TREATMENT
BUILDING

2022

CITY OF HAMILTON
WASTEWATER QUALITY
MANAGEMENT SYSTEM
ANNUAL SUMMARY



Hamilton

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	5
1.1 Purpose	5
1.2 Scope	5
1.3 Overview of Key Milestones	5
1.4 Wastewater Quality Management System Operational Summary	6
1.5 Legal and Other Requirements	6
2. Environment Aspects and Impacts	7
2.1 Overview	7
2.2 Key Updates	8
3. Objectives and Targets	8
3.1 Overview	8
3.2 Key Updates	9
4. Evaluation of Compliance	9
4.1 External Wastewater System Compliance Audit	9
4.2 Status of Findings	9
5. Review and Provision of Infrastructure	10
5.1 Purpose	10
5.2 Process	10
5.3 Overview of Results	11
6. Internal Audits	11
6.1 Wastewater Quality Management System Audits	11
6.2 2023 Wastewater Quality Management System Audit Plan	11
7. Management Review	12
8. Conclusions	13
9. Next Steps	13
List of Figures	
Figure 1: 2022 Wastewater Quality Management System Milestones	5
Figure 2: Wastewater Quality Management System Standard Elements	6
Figure 3: 2023 Wastewater Quality Management System Milestones	13



1. INTRODUCTION

1.1 PURPOSE

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

The purpose of this Wastewater Quality Management System Annual Summary Report is to keep the Owner of the City’s wastewater system informed about the performance of the Wastewater Quality Management System, including major milestones achieved in 2022.

1.2 SCOPE

The Wastewater Quality Management System Standard requires that the Operating Authority (staff within Hamilton Water responsible for the operation, maintenance and provision of support services to the City of Hamilton’s wastewater system) report on certain Elements of the Wastewater Quality Management System to the Owner, specifically the outcomes of Evaluation of Compliance (Element 14), Review and Provision of Infrastructure (Element 15), and Management Review (Element 21). This report fulfills the communication requirements of these elements and exceeds the Standard’s requirements by providing information on Environmental Aspects and Impacts (Element 7), Objectives and Targets (Element 8), Wastewater Quality Management System Audits (Element 20), and other major milestones of the Wastewater Quality Management System for 2022.

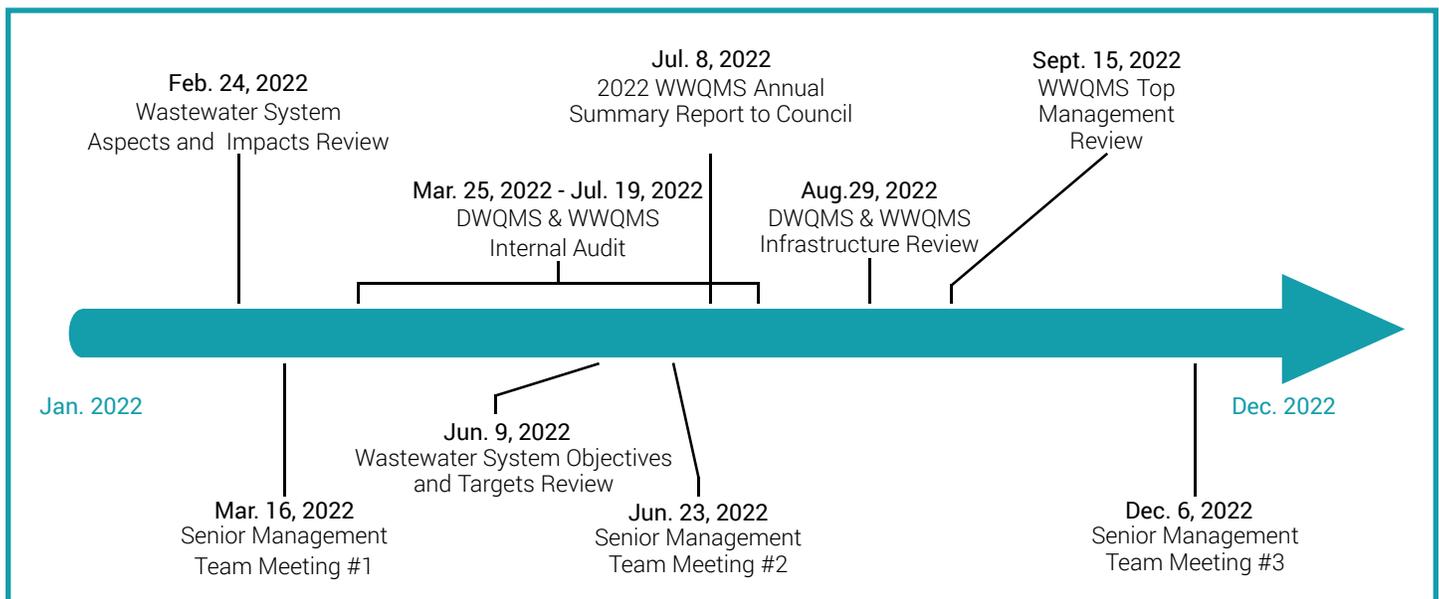
1.3 OVERVIEW OF KEY MILESTONES

On December 16, 2020, the Wastewater Quality Management System Operational Plan was first endorsed by City Council through Report PW20076. Following the endorsement, the Wastewater Quality Management System 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 Wastewater Quality Management System Operational Plan, Wastewater Quality Management System Policy CLEAN, Wastewater Quality Management System Annual Summary Report, and Hamilton Water Financial Plan is now available on the City’s website: www.hamilton.ca/home-neighbourhood/water-wastewater-stormwater/wastewater-collection-treatment/wastewater-quality

Figure 1 illustrates key Wastewater Quality Management System annual milestones which occurred in 2022.

Figure 1: 2022 Wastewater Quality Management System Milestones



DWQMS = Drinking Water Quality Management System & WWQMS = Wastewater Quality Management System

1.4 WASTEWATER QUALITY MANAGEMENT SYSTEM OPERATIONAL SUMMARY

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

Section 2 – **Element 7 Environmental Aspects and Impacts**

Section 3 – **Element 8 Objectives and Targets**

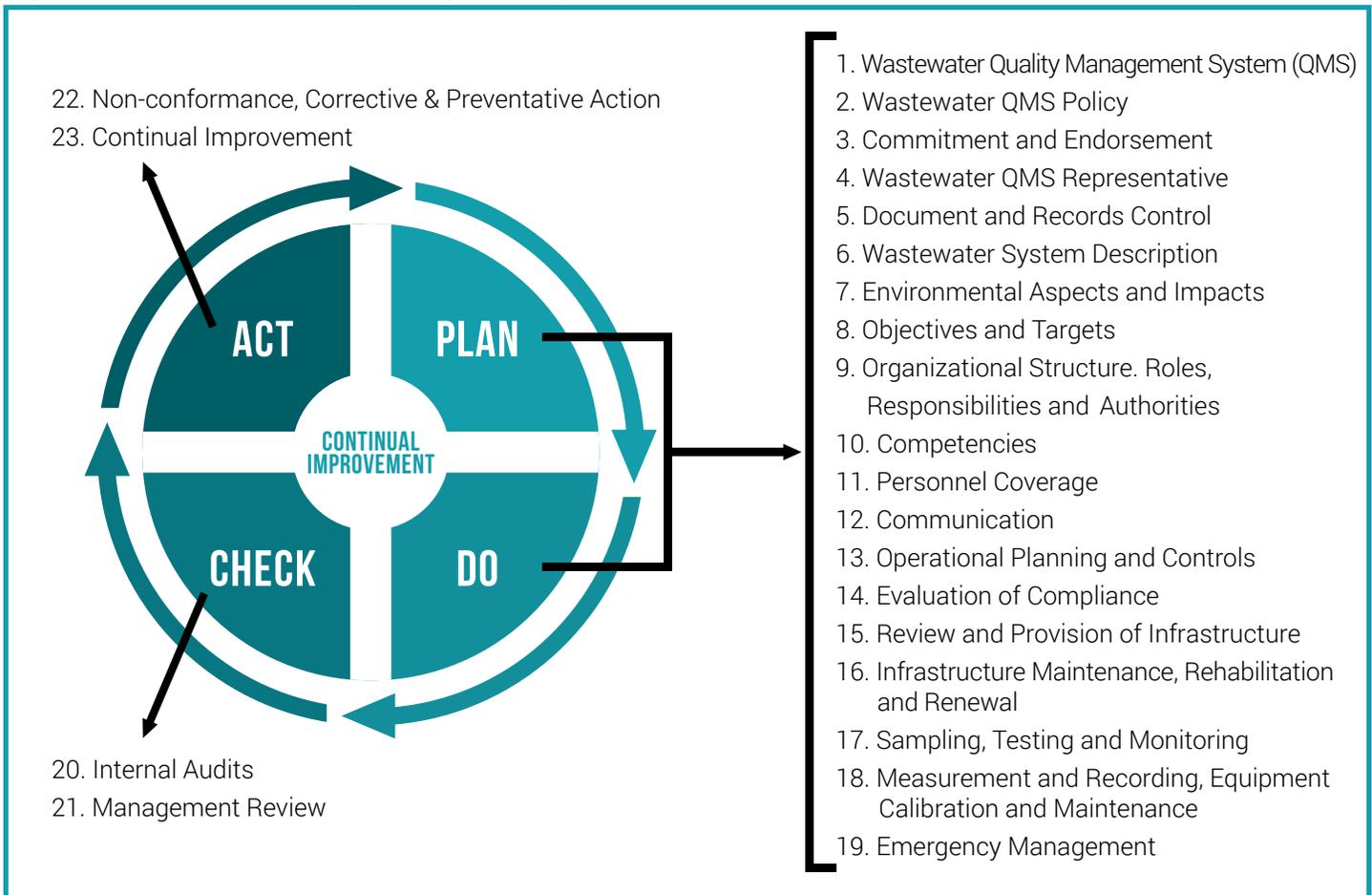
Section 4 – **Element 14 Evaluation of Compliance**

Section 5 – **Element 15 Review and Provision of Infrastructure**

Section 6 – **Element 20 Internal Audits**

Section 7 – **Element 21 Management Review**

Figure 2: Wastewater Quality Management System Standard Elements



1.5 LEGAL AND OTHER REQUIREMENTS

In 2022, no new Environmental Compliance Approvals for pumping stations were received. The construction of the First Street (DC014) sewage pumping station was completed and the Old Dundas Road (HC005) sewage pumping station was brought into service.

The Substantial Performance for Contracts 1 and 2 of the Woodward Upgrades Project was reached. Start-up of flow through the new tertiary treatment facility for Contract 3 at the Woodward Avenue Wastewater Treatment Plant began on October 17, 2022. Substantial Performance is anticipated to be achieved in Q2 2023. The new process conveys tertiary treated effluent through a new outfall and into Red Hill Creek and supports efforts in

delisting Hamilton Harbour as an area of concern as part of the Hamilton Harbour Remedial Action Plan.

An application for a new sanitary sewer system Consolidated Linear Infrastructure Environmental Compliance Approval was submitted by the deadline of January 21, 2022. An application for a new stormwater system Consolidated Linear Infrastructure Environmental Compliance Approval was also submitted, however, stormwater is outside the scope of the Wastewater Quality Management System. Under the terms and conditions of these new consolidated approvals for our sanitary sewer systems, low risk routine projects that meet design criteria and other ministry approved conditions may be reviewed internally and pre-authorized by the City. Hamilton Water staff and the Ministry of the Environment, Conservation and Parks (MECP) are currently working to finalize the terms and conditions of the Consolidated Linear Infrastructure Environmental Compliance Approvals, with the expectation that they will be issued in Q2 2023.

All legal reports were submitted by the required deadlines and there were no self declared non-compliances. The MECP inspected the following wastewater outstations in 2022:

- HCS01 – Greenhill combined sewage overflow tank
- HCG03 – 340 Wentworth Street North and Rosemary Avenue sluice gate
- HCG14 – Both Wellington East and Wellington West sluice gates
- HCG04 – Strathearne sluice gate
- HCS04 – Main and King combined sewage overflow tank
- HC001 – Parkdale sewage pumping station
- Plymouth combined sewage overflow – Both East & West combined sewer outfalls

2. ENVIRONMENTAL ASPECTS AND IMPACTS

2.1 OVERVIEW

The Wastewater Quality Management System Standard requires that an Environmental Aspects and Impacts Assessment be conducted in its entirety every three (3) 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 2022, 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 (8) significant environmental aspects of the Wastewater System were identified:

- Hazardous 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 additions to the significant aspects identified through the 2022 review.

2.2 KEY UPDATES

As part of the Environmental Aspects and Impacts Assessment, process changes, including capital upgrades in the wastewater system, 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 2022 Assessment:

- Changes in wastewater system capacity due to upgrades to pumping stations
- Bypasses at the treatment plants and overflows of combined sewage overflow tanks
- Upgrades and maintenance at the Woodward Avenue Wastewater Treatment Plant
- Instances of incidents and complaints related to the processing of biosolids

In 2023, a full review of the Environmental Aspects and Impacts Assessment process and outcomes will be completed in accordance with the Wastewater Quality Management System Standard. Hamilton Water staff continue to work to integrate the Wastewater Quality Management System 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 Wastewater Quality Management System Environmental Aspects and Impacts Assessment and Infrastructure Review will be updated to incorporate any new related processes or requirements.

3. OBJECTIVES AND TARGETS

3.1 OVERVIEW

The Wastewater Quality Management System Standard requires that Objectives and Targets be established to avoid or minimize environmental impacts from the City's Wastewater System. The Objectives and Targets were set based on evaluation criteria identified in the Wastewater Quality Management System Standard. The following are the list of evaluation criteria:

- Significant aspects
- Wastewater Quality Management System 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 properties
- To meet all Environmental Compliance Approvals and Hamilton Harbour Remedial Action Plan requirements for final effluent quality for the Dundas and Woodward Avenue Wastewater Treatment Plants

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

In 2022, the Objectives were reviewed to ensure that they were still appropriate based on evaluation criteria outlined in the Wastewater Quality Management Standard. No changes were made to the three Objectives for the City's wastewater system.

In 2022, the City's performance to targets was reviewed. The following are the outcomes of the review of targets:

- Although dry weather flow capture rate was 100%, wet weather flow capture rate was 78.2%. Thus, F-5-5 requirements (i.e. over 90% of wet weather flow was captured; primary level of treatment was achieved for carbonaceous biochemical oxygen demand and total suspended solids removal in combined flows above the dry weather flow) were partially met. This review was conducted in September 2022 for the reporting period January 2021 to December 2021.
- 41% of industrial, commercial and institutional sewer discharge permits were processed within ninety (90) days. Fifteen (15) permits expired without a new permit in place. 71% of Notices of Violation were sent within three (3) weeks of being posted. Thirty four (34) properties were assessed. This review was conducted in September 2022 for the reporting period July 2021 to July 2022.
- Woodward and Dundas wastewater treatment plants were in 100% compliance with their Environmental Compliance Approvals. However, Hamilton Harbour Remedial Action Plan limits for total suspended solids, total phosphorous and total ammonia nitrogen were not met. This review was conducted in September 2022 for the reporting period July 2021 to July 2022.

The Management Programmes were updated throughout the year to add new projects or reflect changes in project status.

4. EVALUATION OF COMPLIANCE

4.1 EXTERNAL WASTEWATER SYSTEM COMPLIANCE AUDIT

The Operating Authority voluntarily retained the services of Wood PLC in March 2020 to evaluate the compliance of the wastewater system with legal and other requirements. Due to the COVID-19 pandemic, the audit was conducted off-site virtually. There were ten (10) non-compliances, nine (9) recommendations and four (4) best practices identified.

4.2 STATUS OF FINDINGS

Of the ten (10) non-compliances from the 2020 audit, four (4) were closed in 2020, three (3) were closed in 2022, and three (3) remain open in 2023. The three (3) open non-compliances are tied to maintenance projects and corrective actions are ongoing. The recommendations and best practices were considered for future action as required.



5. REVIEW AND PROVISION 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 Wastewater Quality Management System 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. An Infrastructure Review Coordination meeting was held with the Management Team of Hamilton Water to discuss the outcomes of both the horizontal and vertical infrastructure reviews. This Wastewater Quality Management System Annual Summary Report (2022) includes a brief summary of the results of the Wastewater Quality Management System Infrastructure Review.

5.2 PROCESS

Teams were assembled from across relevant sections of Hamilton Water, Engineering Services and Planning and Economic Development to conduct the review of wastewater infrastructure. A coordination meeting was held on August 29, 2022 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 Operations & Maintenance	<ul style="list-style-type: none"> • Linear Sewer Inspections and Condition Assessments including Sewer Age Profiles, Closed-Circuit Television and Cured in Place Pipe Lining • Wastewater Collection Maintenance Program • Sewer Maintenance, Repair and Replacement Program • Inspection Programs – Maintenance holes, Sewer Booms, Combined Sewer Regulators, Air Valves, Combined Sewer Outfalls, Sewer Lateral Backups • Sewer Lateral Management Program • Mainline Sewer Blockages
Horizontal Infrastructure Capital	<ul style="list-style-type: none"> • Capital Maintenance Projects • Mainline Sewer Rehabilitation Projects • Asset Management Plan Updates • Master Plan Updates
Vertical Infrastructure Operations & Maintenance	<ul style="list-style-type: none"> • Preventative Maintenance Program • Inspection Programs by Enhanced City of Hamilton Outstations Team
Vertical Infrastructure Capital	<ul style="list-style-type: none"> • Large Capital Projects • Condition Assessments • Asset Management Plan Updates • Master Plan Updates

5.3 OVERVIEW OF RESULTS

The outcomes and recommendations from the Infrastructure Review Coordination meeting were documented in meeting minutes for the 2022 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 2022 Infrastructure Review at the Top Management Review meeting on September 15, 2022.

The 2022 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. INTERNAL AUDITS

6.1 WASTEWATER QUALITY MANAGEMENT SYSTEM AUDITS

The Operating Authority must conduct annual internal audits to evaluate the conformity of the wastewater system with the requirements of the Wastewater Quality Management System Standard and its procedures.

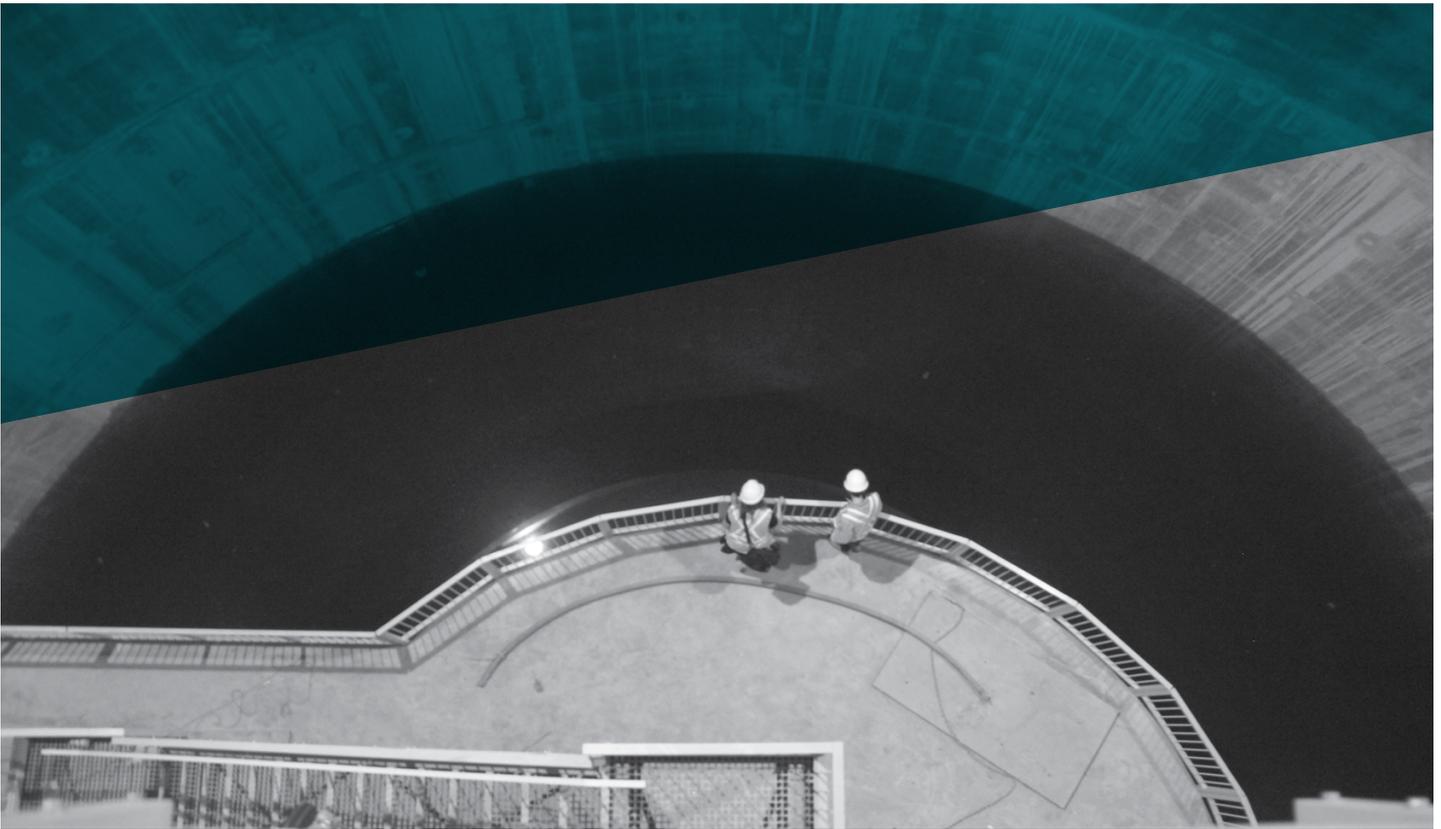
In 2022, the Wastewater Quality Management System Internal Audit was integrated with the Drinking Water Quality Management System audit. The results of the annual Wastewater Quality Management System Internal Audit of all twenty three (23) elements of the Wastewater Quality Management System Standard conducted in 2022 demonstrated that the City of Hamilton's Wastewater Quality Management System contains the required procedures and records to illustrate the establishment and continual improvement of the management system.

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

6.2 2023 WASTEWATER QUALITY MANAGEMENT SYSTEM AUDIT PLAN

The Compliance Support Group of the Compliance & Regulations Section developed an Audit Plan for the 2023 Wastewater Quality Management System Internal Audit. The audit is to take place between April and July 2023. The plan will include a number of process and element audits. The Audit Plan will be 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 Wastewater Quality Management System Standard requires a documented procedure to describe how the Operating Authority reviews the suitability, adequacy and effectiveness of the Wastewater Quality Management System. The “Check” component of the element requires that Top Management participate in a management review at least once per year to review the Wastewater Quality Management System 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 action items including responsibilities and timelines
- Report the results of the management review to the Owner

In 2022, the Wastewater Quality Management System Top Management Review was held on September 15, 2022. Attendees included Top Management (General Manager of Public Works and Director of Hamilton Water), Directors, Section Managers, Overall Responsible Operators 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 Wastewater Quality Management System is suitable, adequate and effective.

Action Items were assigned following the 2022 Wastewater Quality Management System Top Management Review that will result in operational improvements, improved communication and better coordination between Hamilton Water and other City departments.

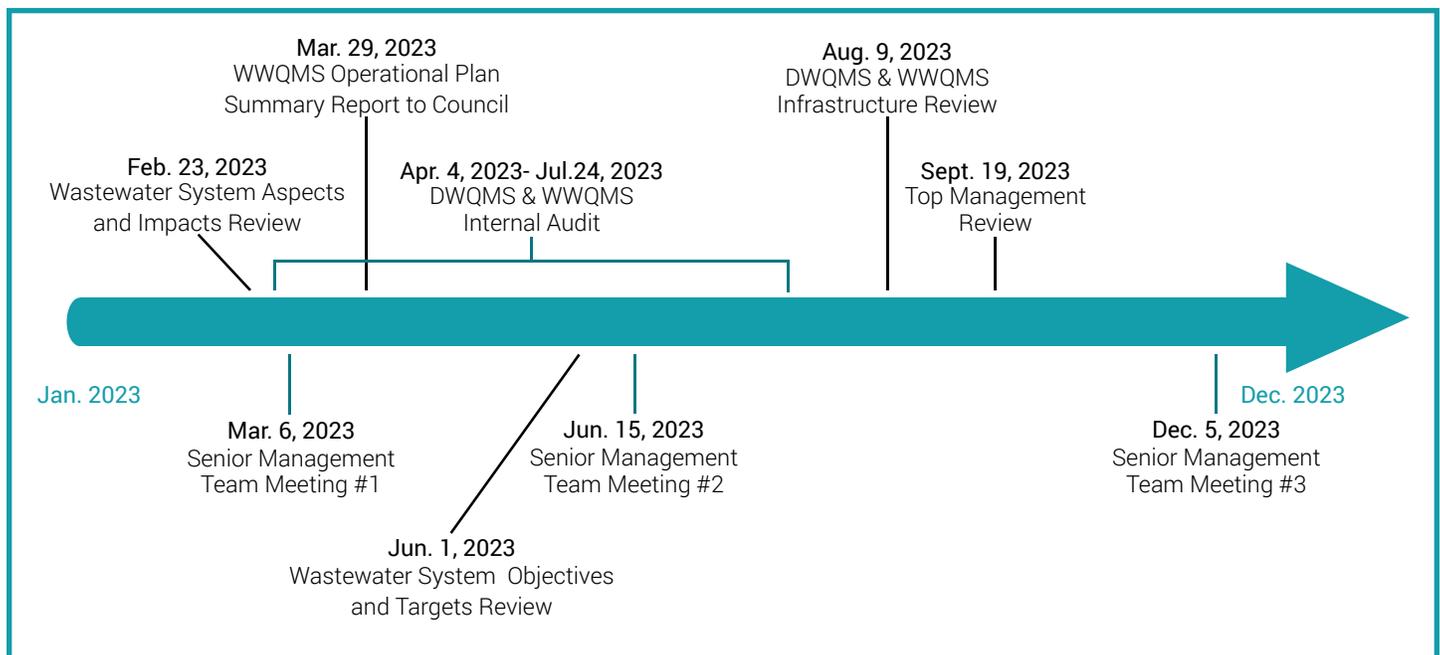
8. CONCLUSIONS

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

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 Wastewater Quality Management System in 2023 are detailed in [Figure 3](#).

Figure 3: 2023 Wastewater Quality Management System Milestones



DWQMS = Drinking Water Quality Management System & WWQMS = Wastewater Quality Management System

