

REPORT TO COUNTY COUNCIL

2023 Drinking Water Quality Management System Update

To: Warden and Members of County Council

From: Director of Public Works

RECOMMENDATION

1. That County Council receive Report PW 2024-14 entitled “2023 Drinking Water Quality Management System Update” as information.

REPORT HIGHLIGHTS

- In accordance with provincial legislation, this report presents County Council, recognized as the Owner responsible for all municipal drinking water systems in Oxford County, with a summary of key processes and activities undertaken in 2023 to evaluate the continuous improvement, suitability, adequacy and effectiveness of the water Quality Management System (QMS) against the provincial Drinking Water Quality Management Standard (DWQMS).
- Of note, the water QMS processes and programs chosen for internal auditing in 2023 included the review of current training and certification processes and the QMS representatives’ programs and processes.
- The recent proposed consolidation of the water QMS and Operational Plan was determined to successfully meet the DWQMS requirements following a third-party external audit in 2023. Full transition to the consolidated Operational Plan will be complete in 2024.

IMPLEMENTATION POINTS

The County and its contracted service providers (Town of Tillsonburg, City of Woodstock) continue to follow the County directed water QMS policies and procedures to meet the requirements of the DWQMS (V2.0, February 2017) and to comply with the requirements of subsection 16(2) of the *Safe Drinking Water Act, 2002*.

The County's QMS coordinator will continue to review and reaffirm coverage and oversight of the County's 17 municipal drinking water systems under the transition to the consolidated Operational Plan. In addition, the County QMS representative and professionally trained internal auditors will perform a planned internal audit of the same in 2024.

Through these undertakings, the refinements to the consolidated Operational Plan currently underway will be assessed to ensure continued conformity to the DWQMS prior to the final transitional audit and full reaccreditation audit by the County's Accreditation Body (SAI Global) in 2024. Reaccreditation audits occur once every three years to reaffirm an organization as an approved Operating Authority which serves as one of the required components of the Municipal Drinking Water License (refer to Figure 1).

All 17 Municipal Drinking Water System Licences in Oxford County are due for renewal beginning in November 2024. The renewal of the Municipal Drinking Water License is required by the MECP every five years. Staff will be reporting to Council later this year regarding proposed Financial Plans for all County Drinking Water Systems as a legislated requirement to renew the County's Drinking Water Licence over the period from 2025 to 2030.

Financial Impact

The total operating budget for the County-wide QMS in 2023 included expenses of \$83,000 related to the development and ongoing maintenance of the water QMS for all municipal residential drinking water systems in the County. This also included expenses related to the external audits and limited scope transitional audits to confirm compliance of the consolidated Operational Plan and water QMS.

There are no financial impacts as a result of this report. Any required actions that will result in expenditures have been accounted for in the 2024 Operating or Capital Budgets of the respective drinking water systems.

Communications


This report (PW 2024-14) along with Report [PW 2024-06](#) (2023 Drinking Water System Performance) serve to meet the DWQMS requirements of reporting the results of the water QMS Annual Management Review to the drinking water system Owner representatives (Oxford County Council/Chief Administrative Officer).

This report also serves to communicate back to Council that County staff have fulfilled the resolution from Report [PW 2023-26](#) and processed the subsequent administrative updates to the municipal water Quality Management System, which institutes a consolidated Operational Plan that governs the oversight of Oxford's 17 municipal drinking water systems.

2023-2026 STRATEGIC PLAN

Oxford County Council approved the [2023-2026 Strategic Plan](#) on September 13, 2023. The Plan outlines 39 goals across three strategic pillars that advance Council's vision of "Working together for a healthy, vibrant, and sustainable future." These pillars are: (1) *Promoting community vitality*, (2) *Enhancing environmental sustainability*, and (3) *Fostering progressive government*.

The recommendations in this report supports the following Strategic Plan pillars and goals:

		
Promoting community vitality	Enhancing environmental sustainability	Fostering progressive government
Goal 1.3 – Community health, safety and well-being		Goal 3.1 – Continuous improvement and results-driven solutions Goal 3.2 – Collaborate with our partners and communities Goal 3.4 – Financial sustainability

See: [Oxford County 2023-2026 Strategic Plan](#)

DISCUSSION

Background

Oxford County Drinking Water Systems

Under the *Municipal Act, 2001*, the County of Oxford holds exclusive municipal authority and responsibility for all water and wastewater services. Accordingly, Oxford County is a recognized municipal water authority which owns all municipal drinking water system assets, including water treatment and distribution system assets in all 17 municipal drinking water systems.

The owner of the municipal drinking water system, represented by County Council and the Chief Administrative Officer (CAO), must uphold the Statutory Standard of Care when executing decision making related to the municipal drinking water system. The Statutory Standard of Care provisions of the *Safe Drinking Water Act, 2002* make individuals with oversight responsibilities for municipal drinking water systems legally responsible for decisions made regarding the system.

Oxford County operates and maintains all 17 municipal drinking water systems, with the exception of a limited portion of its linear water distribution systems in Tillsonburg and Woodstock. For the County's water systems located in Woodstock and Tillsonburg, Oxford County operates and maintains all water treatment system assets (raw water supply wells, water treatment plants, high lift pumping stations) and part of the water distribution system assets (water transmission mains, water booster pumping stations, water re-chlorination facilities/analyzers, water towers, water reservoirs). The remaining limited portion of the water distribution system linear assets (distribution watermains, valves, fire hydrants, water meters) are operated and maintained by Tillsonburg and Woodstock, respectively, on behalf of Oxford County, under service contract agreements (as permitted under the *Municipal Act, 2001*).

Through a collective effort and mutual participation, all parties updated the service agreements as per the resolution from Report PW 2023-26. The new agreements came into affect January 1, 2024 and reflect the collective agreement to continue to provide enhanced service delivery with an emphasis on continuous improvement and implementation of industry best management practices.

Water Quality Management Systems (QMS)

The water QMS contains elements of both the ISO 9001 standard with respect to management systems and the Hazard Analysis and Critical Control Points (HACCP) standard with respect to product safety. The water QMS also incorporates the HACCP approach to risk assessment and reflects the multi-barrier approach for municipal drinking water system safety.

The water QMS must be fully documented in an Operational Plan that satisfies the requirements of the 21 best practice elements which are comprehensively prescribed in the MECP's DWQMS. The Operational Plans are intended to reflect fully implemented water QMS with a focus on continual improvement. An MECP accepted Operational Plan is just one part of the regulatory components that must be satisfied by the County, as the responsible owner, to maintain each of its 17 Municipal Drinking Water Licenses as shown in Figure 1.



Figure 1 – Municipal Drinking Water License Regulatory Components

Oxford County maintains the Operational Plan and the water QMS policies and procedures that govern the operations and maintenance performed by the County and its contracted service providers on all 17 drinking water systems.

As shown in Figure 2, each stage of the annual water QMS review process (as documented in the Operational Plan) is undertaken to ultimately identify opportunities for improvement (OFIs) and improvement and corrective action records (ICARs) on the municipal drinking water system. Following the review process, the County's QMS coordinator subsequently incorporates any updates or new water QMS policies and procedures within.



Figure 2 – Annual Water QMS Review and Continuous Improvement Process

Each of these components is discussed in greater detail in the comments section below.

Comments

Internal Audit Findings

As required by the MECP's DWQMS, Oxford County and its contracted service providers undergo internal auditing of the water QMS documented in the Operational Plan against the MECP's DWQMS at least once every calendar year. The audit is conducted by the County's QMS Coordinator and professionally trained internal auditors to assess the conformance of the Operational Plan and associated QMS processes/procedures against the DWQMS (V2, Feb. 2017), under the *Safe Drinking Water Act, 2002*.

Each year, internal audits are performed as complete system audits, broken out into process audits or audits of specific individual DWQMS elements. Each of the 21 DWQMS elements must be audited once per audit cycle (completed on a rotational basis once every 36 months).

The water QMS processes and programs chosen for internal auditing in 2023 included review of current training and certification processes and the QMS representatives' programs and processes. Site audits were conducted in eight different drinking water systems in 2023. The internal audit findings were minor in nature:

- One non-conformance was noted as the Operational Plan did not contain a written endorsement of its contents by Top Management and the Owner (actioned following revisions made to the Operational Plan per new service contract agreements); and

- Five OFIs were noted to:
 - Improve the process to track status on ICARs, OFIs and Action Items;
 - Better secure PDF versions of controlled documents;
 - Standardize the tracking of training and certification records;
 - Improve the process for ensuring new position titles are updated in the water QMS operational plan and procedures; and
 - Improve access to QMS documents at operational sites.

Internal audit findings are addressed through the water QMS Continual Improvement Process. At the time of this report, there is one active ICAR from the OFI above, all others have been closed are being monitored for effectiveness.

2023 Emergency Response Plan Testing

Annual testing of the Emergency Response Plan can take the form of training sessions, mock incidents or debriefing the response to an actual emergency. In the last case, an incident debrief is recommended to point out opportunities for improvement.

An emergency response mock incident was conducted in September 2023. This was the first emergency scenario to incorporate staff from multiple municipalities, involving 25 staff participants from many levels of Oxford County Water Services, Town of Tillsonburg Water Distribution, and Oxford County Communications.

The mock scenario was instigated via email to assess participant's identification and response to a hypothetical emergency scenario with the goal of defining and refining participant's roles and responsibilities under the Emergency Response Plan (ERP) and the associated policies or procedures. All participants were invited to participate on a feedback survey following the mock event.

The feedback gained was primarily positive for practicing the ERP in a consolidated mock scenario and three OFIs were identified as improvements for the Water Services Emergency Response Plan and associated Procedures. The results of the ERP testing were communicated in a newsletter to all participants and water services staff. The OFIs identified were later implemented as ICARs and are being monitored for effectiveness.

Water QMS Risk Assessment

The water QMS Risk Assessment Process ensures all potential hazards, associated hazards or hazardous events associated with drinking water quality are properly identified, ranked and assessed. The assessment results provide Oxford County and its contracted service providers with guidance to identify critical events, control measures, critical control points and procedures to adequately manage risk while safeguarding the municipal drinking water quality and performance.

The Risk Assessment Process is required every 36 months for each of the County's drinking water systems (completed in 2023), with complementary risk assessment reviews to be completed at 12 (to be completed in 2024) and 24 months (to be completed in 2025) between the assessments to verify the currency of the information and the validity of the assumptions used in the risk assessment.

During the 2023 Risk Assessment the following are some of the updates that were made:

- New hazard added for unauthorized water access via fire hydrants (a reoccurring best management practice recommendation noted in various MECP audits in both 2022 and 2023);
- Several previously assessed hazards were further split or defined from existing identified hazards (i.e. loss of communications, transmission main breaks where only a single feed exists or the transmission main is under a waterway);
- A distribution main break with the potential to impact private property was added;
- Threats determined to be similar in nature and that share the same likelihood, detectability and risk were consolidated into a single threat; and
- Pressure tank failures and extreme water temperatures in elevated storage (Woodstock) were both reduced in risk, based on improvements in detectability and reductions in likelihood, respectively.

One OFI was identified during the Risk Assessment in 2023 to investigate the viability of using the County water models to assess the benefits gained by adding transmission main redundancy. This OFI has since become an ICAR and is currently in progress.

The 2023 Risk Assessment also directly ties in infrastructure review and budgetary considerations by identifying planned capital projects or operational enhancements that could be made to manage hazardous events. Some examples include:

- The Water Capacity Buy Back Program as a component of the County's overall water efficiency plan to manage water supply sustainability and/or water system capacity limitation;
- The SCADA Master Plan which will increase the detectability rating of various hazardous events; and
- Filtration upgrades to address parameters of concern.

External Audit Findings

The County's Accreditation Body (SAI Global) completed the required annual surveillance audit in 2023. Based on the results of this audit it was determined that the quality management system is effectively implemented and maintained to meet the requirements of the DWQMS. No non-conformances to the DWQMS were noted but four OFIs were identified all of which have since been addressed and closed under the continuous improvement process.

As well, in preparation for the updated service agreements which came into effect January 1, 2024, the County completed a detailed review and update of its water QMS and Operational Plan. In October 2023, a limited scope transitional audit by the County's Accreditation Body (SAI Global) was performed which assessed and confirmed that the proposed changes (i.e. consolidation of operational plans into a single operational plan) met the key elements of the DWQMS. No non-conformances to the DWQMS were noted and the consolidated Operational Plan was issued January 1, 2024, in concert with the updated service agreements.

Management Review

Under legislation, the DWQMS requires that a Management Review meeting be held annually by Oxford County to review findings of the annual QMS review and continual improvement process (refer to Figure 2). The Management Review process ensures that all levels of the organization (Owner, Top Management, Operations) are kept informed and aware of the performance of the DWQMS (as documented in the Operational Plan) which governs the operations and maintenance performed by the County and its contracted service providers across all 17 drinking water systems.

The DWQMS lists 16 specific information items that must be part of the annual Management Review including, but not limited to, incidents of regulatory non-compliance, incidents of adverse drinking water tests, raw water supply and drinking water quality trends, operational performance and results of the infrastructure review. These items formed part of the overall performance review of the County's 17 drinking water systems (Report PW 2024-06).

The annual Management Review conducted in February 2024 also included the review of:

- Discussion and follow up on action items from previous management reviews as well as any new items identified since the last review;
- Operational considerations and challenges as part of operational performance;
- Effectiveness of the risk assessment process and deviations from critical control points and responses;
- Results of MECP drinking water system inspections;
- Results of internal and external audits;
- Results of emergency response testing and training;
- Changes that could affect the water QMS;
- Resources needed to maintain the water QMS;
- Customer feedback;
- Suggestions brought forward by Operations and Compliance staff; and
- A summary of ongoing continual improvement efforts.

One new OFI was identified in the 2023 Management Review to improve the current process for tracking of customer feedback across all County owned water systems to better identify trends in customer complaints. This and other action items will be addressed through the QMS Continual Improvement process in 2024.

Summary of Overall Continuous Improvement

Considerable changes were made related to the procedure for how continual improvement items, OFIs, and ICARs are tracked, implemented, and monitored. The improvements in this workflow allowed the County QMS Coordinator to better facilitate the continual improvement process and reduce the total active continual improvement items by nearly half in 2023 (24 open/active corrective actions by 2023 year end). A comparison of the continual improvement status for ICAR and OFI is shown in Table 1.

Table 1 – Overall summary of Outstanding Water QMS Corrective Actions

	2022	2023
Outstanding OFI <i>(as of January 1)</i>	18	41
New OFI <i>(created during reporting year)</i>	44	20
<i>Implemented OFI (Closed)</i> <i>(as of December 31)</i>	21	49
Total OFI Remaining	41	12
Outstanding ICAR <i>(as of December 31)</i>	3	11
New ICAR <i>(created during reporting year)</i>	15	12
<i>Implemented ICAR (Closed)</i> <i>(as of December 31)</i>	7	11
Total ICAR Remaining	11	12
TOTAL CORRECTIVE ACTIONS <i>(active / open)</i>	52	24

Some of the outstanding OFI relate to:

- Long term implementation plans to streamline the Asset Management software used across all County water systems;
- Integrating work order requests through the billing service provider (ERTH) into the Asset Management Software; and
- Improvements to the workflow and standardization of the GIS for all water systems to the same platforms.

Some of the outstanding ICARs relate to the development or refinement of policies for:

- Power failure;
- Alterations to the drinking water system documentation;
- Sampling plans for offline plants prior to return to service;
- Standardizing operator training documentation; and
- Responding to low pressure events in small distribution systems.

Outstanding implementation of these key items will continue to be monitored by County staff and the City of Woodstock and Town of Tillsonburg staff to complete this critical work.

The QMS Coordinator will continue to prioritize and close active/open OFI and ICARs. In many cases an updated action plan and follow up system has already been established. This is in addition to any new OFIs and ICARs identified through the Annual QMS Review and Continuous Improvement Process which will restart again in 2024.

CONCLUSIONS

The results of the annual Management Review of the County's DWQMS demonstrates continued compliance with drinking water regulations and the County's ongoing commitment to continual improvement in the provision of safe, reliable and sustainable supply of municipal drinking water for its residents and businesses.

Managing the County's water QMS within one consolidated Operational Plan will afford the ability to harmoniously undertake all quality management tasks for all 17 drinking water systems in a singular (versus triplicate) fashion while achieving associated efficiencies and cost savings. The consolidated Operational Plan reflects and ensures that the same approach for care and control is consistently applied across all 17 drinking water systems from source to tap.

SIGNATURES

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