SUBJECT: The Status of the City of Hamilton’s Drinking Water Quality Management System - (PW07095) - (City Wide)

RECOMMENDATION:

(a) That Council endorse Option 2 in Report PW07095 for submission of the Operational Plan as per the licensing requirements under the Safe Drinking Water Act, 2002;

(b) That Council endorse the Drinking Water Quality Management Policy Statement attached as Appendix B to report PW07095;

(c) That the Manager, Compliance and Regulations be designated as Systems Management Representative for the Drinking Water Quality Management System as defined under the Safe Drinking Water Act, 2002.

Scott Stewart, C.E.T.
General Manager
Public Works

EXECUTIVE SUMMARY:

The Water and Wastewater Division of Public Works (W- WW) is developing a Drinking Water Quality Management System (DWQMS) to meet Ontario’s legislative requirements under the Safe Drinking Water Act, 2002 and Ontario Regulation (O.Reg.) 188/07 entitled “Licensing of Municipal Drinking-Water Systems”. The Ministry of the Environment’s Drinking Water Quality Management Standard prescribes the requirements of the DWQMS, which identifies 21 elements for which the Quality
Management System is to be implemented following the framework of the ISO management system standards thorough the adoption of the ‘Plan-Do-Check-Improve” cycle. The legislation and DWQMS Standard have specific requirements for the “owner” of a drinking-water system which includes endorsement of the Operational Plan and DWQMS Policy. Following the DWQMS Guidance document, the “Owner” of a drinking water system is defined as the Mayor and Council. “Top Management” of the operating authority is defined as the General Manager of the Public Works Department and the Senior Director of the Water and Wastewater Division. The operating authority is required to submit an “Operational Plan” and for its preparation it has three options, as follows:

**Option 1:** Submit a scoped Operational Plan covering “Plan” and “Do” activities for select elements as an “Option 1” submission;

**Option 2:** Submit a scoped Operational Plan covering only “Plan” activities for all 21 elements as an “Option 2” submission;

**Option 3:** Submit a full operational plan as an "Option 3" submission, covering “Plan” and “Do” activities for all 21 elements.

As required by the Guidance Document, Top Management for the DWQMS is seeking Council’s endorsement of the System Policy, submission Option 2 for the Operational Plan, and appointment of the Manager of Compliance and Regulations as the Systems Management Representative.

**BACKGROUND:**

**Introduction**

The Water and Wastewater Division of Public Works is currently developing a DWQMS which conforms to the new Ministry of the Environment DWQMS Standard. It is a priority of the Public Works to provide effective, safe, sustainable drinking water, wastewater, and storm sewer services. Report PW07095 details the legislative background of the DWQMS Standard and the approach that staff is proposing to address this new legislative challenge.

**LEGISLATIVE BACKGROUND**

**Ontario’s Water and Infrastructure Legislation**

The Safe Drinking Water Act, 2002, was passed in response to the tainted-water tragedy at Walkerton, Ontario in May 2000. The Safe Drinking Water Act aims to protect the health of Ontario residents by applying stringent regulations to drinking-water systems in the province, and is part of a multi-pronged approach to water management in Ontario. In all, three pieces of legislation: the Safe Drinking Water Act, the Clean Water Act and the Sustainable Water and Sewage Systems Act, work together to protect the province’s water resources along with water treatment and distribution infrastructure.

The purpose of the Safe Drinking Water Act is to protect human health by controlling and regulating drinking-water systems and drinking-water testing in the province. Through its supporting regulations and standards, the Safe Drinking Water Act defines requirements for the treatment and distribution of drinking water and for the competency of operators and analysts in the industry. The accreditation and licencing of the City’s
Environmental Laboratory for drinking water testing was one of the earlier requirements of the Safe Drinking Water Act. Our City’s Environmental Laboratory has fulfilled this requirement since 1995. The accreditation process for drinking water systems was approved with the release of Ontario Regulation 188/07 on May 19, 2007. As a result, an Operating Authority will need to be accredited by a third-party Accreditation Body through the establishment and maintenance of the DWQMS. In addition, Certificates of Approvals will be replaced with a Drinking Water System Permit.

Licensing and Regulation of Drinking-Water Systems

Currently, the Ministry of the Environment is revising its process for licensing and regulating drinking-water systems in the Province of Ontario. The revisions will see the current “Certificate of Approval” process replaced with a more comprehensive “Drinking Water Licence” process. In order to successfully achieve licensed status, a municipal drinking water system will be required to:

- obtain a Permit to Take Water (currently in place);
- develop a management system compliant to the Drinking Water Quality Management Standard;
- obtain a Drinking Water Works Permit;
- develop and submit an Operational Plan for approval;
- develop and submit a Financial Plan for approval; and
- complete the Accreditation Process to register the DWQMS.

The Drinking Water Quality Management Standard

The DWQMS Standard provides a framework for the development and implementation of a quality management system for drinking-water systems. Created by the MOE and released in October 2006, the DWQMS follows the framework of the ISO management system standards through the adoption of the “Plan-Do-Check-Improve” cycle and brings a strong focus to the concepts of internal auditing, measurement, monitoring, and maintenance. The key requirements of the DWQMS Standard are as follows:

- Establish and endorse a DWQMS policy;
- Complete a risk assessment and implement adequate controls;
- Define roles, responsibilities, and authorities including owners, top management, and the DWQMS Management System Representative;
- Establish competency and training requirements for personnel whose work affects water quality;
- Establish procedures for communication;
- Ensure reliable, consistent procurement of supplies and services;
- Monitor water quality parameters and equipment performance;
- Conduct internal audits and annual reviews; and
- Establish emergency response procedures.

ANALYSIS/RATIONALE:

Operational Plan

The Operational Plan provides a summary of the organization’s DWQMS and addresses the requirements of the Standard elements in general terms, with references
SUBJECT: The Status of the City of Hamilton’s Drinking Water Quality Management System - (PW07095) - (City Wide) - Page 4 of 8

to more specific system procedures. The Operational Plan must be endorsed by the System Owner and Top Management of the Drinking Water System(s).

Typically, a municipality’s Council is defined as the “owner” of the Drinking Water System. In submitting its operational plan, an Operating Authority has three options:

**Option 1:** Submit a scoped Operational Plan covering “Plan” and “Do” activities for select elements as an “Option 1” submission;

**Option 2:** Submit a scoped Operational Plan covering only “Plan” activities for all 21 elements as an “Option 2” submission;

**Option 3:** Submit a full operational plan as an “Option 3” submission, covering “Plan” and “Do” activities for all 21 elements.

Top Management of the DWQMS are recommending that the City submit their Operational Plan under Option 2 which requires the DWQMS documentation (“Plan”) for all elements and a subsequent year to complete the implementation of the DWQMS (“Do”). Based on the progress of the implementation of the DWQMS, its Top Management can recommend that the preferred submission option be modified. Option 2 is the recommended option because Hamilton has a large and complex drinking water system; the implementation of a DWQMS requires a significant amount of effort and is linked to other water programs related to source water protection and asset management. As an example, staff are currently completing an asset management program for both water and wastewater infrastructure which will be completed over the next year or longer. The annual review of the adequacy of water infrastructure is a requirement of the DWQMS Standard and relies on the completion of the asset management program. The subsequent year will provide the City with adequate time to complete other related programs and also provide staff with an opportunity to continually improve the DWQMS.

**The Audit Process**

Once the Operational Plan has been submitted to the Ministry of the Environment, the Operating Authority must apply to the Ministry’s designated Accreditation Body\(^1\) to request an audit of its DWQMS. For Option 2, the auditor conducts a **Systems Audit**, reviews the Operational Plan, the System Policy, and other DWQMS documentation to ensure that they meet all applicable requirements of the Standard. This step allows the auditor to verify that the “Plan” component of the Standard has been completed. After 12 months the Accreditation Body conducts an on-site Verification Audit to ensure procedures are implemented as required by the DWQMS Standard and the Operational Plan. Once accreditation is achieved, the auditor will conduct annual surveillance audits on a three-year cycle with a full re-accreditation audit to be completed every third year.

**The DWQMS Policy**

The DWQMS Standard has requirements that must be contained within a DWQMS Policy and must be endorsed by the “Owner”. The Operational Plan shall document a DWQMS Policy that provides the foundation for the Quality Management System, and:

a) is appropriate for the size and type of the subject system,

---

\(^1\) At present, the MOE has not identified who will serve as the third-party Accreditation Body.
b) includes a commitment to the maintenance and continual improvement of the Quality Management System,

c) includes a commitment to the consumer to provide safe drinking water,

d) includes a commitment to comply with applicable legislation and regulations, and

e) is in a form that provides for a ready communication to all Operating Authority personnel, the Owner and the public.”

The DWQMS Policy will be a cornerstone of the system. Top Management of the DWQMS has developed a draft DWQMS Policy for Council’s review and endorsement. A copy of the draft DWQMS Policy is included in Appendix B of this Report. Once endorsed, the DWQMS Policy will be communicated to meet the DWQMS Standard requirements.

**DWQMS Implementation Schedule**

The DWQMS “Plan” and “Do” components will be completed over the next 24 months. Staff have initiated the DWQMS implementation due to its internal and external resource requirements. The target for submission of the Operational Plan will be on the mandated date of January 1, 2009.

**City of Hamilton’s Divisional Approach**

Public Works is undertaking a unique approach to complying with Ministry of the Environment’s DWQMS Standard. It is a priority of Public Works to provide effective, safe, sustainable drinking water, wastewater, and storm sewer services. Staff are applying Division-wide strategic planning and program-based solutions to legislative changes and operational issues. As a result, the Water and Wastewater Division’s approach to the DWQMS Standard is a DWQMS supported by a Division-wide “Beyond Compliance Operating System” or BCOS System.

The Beyond Compliance Operating System integrates the DWQMS, Biosolids Quality Management System, Environmental Laboratory Quality Management System and conforms to environmental (ISO 14001:2004) and health and safety (OHSAS 18001/CSA Z1000) standards. A recent example of a Beyond Compliance Operating System initiative is the Division’s new Confined Space Program. Appendix A identifies the Beyond Compliance Operating System as an “umbrella” system that supports other scoped management systems of the Water and Wastewater Division.

The legislative aspect of the DWQMS places a higher priority on its requirements; as such, the DWQMS will likely drive the development of the Divisional Beyond Compliance Operating System Program. The proposed implementation approach is to concurrently develop the Beyond Compliance Operating System and DWQMS procedures or “Plan” requirements. However, it is anticipated that the implementation (or “Do”) stage of the Beyond Compliance Operating System will take longer to implement due to its expanded Divisional and Environmental Quality Health and Safety scope. The DWQMS implementation will take precedence where required, especially for elements that require significant internal and external resources.

**BCOS/DWQMS Organizational Structure**

The DWQMS Standard requires that a “Management Representative” be appointed to oversee and guide the implementation of the quality system. This parallels the
Division’s requirement for a “Beyond Compliance Operating System Management Representative”. To facilitate continued success in system implementation and in integration of common elements, staff will be appointing a single “Systems Management Representative” to oversee the Beyond Compliance Operating System and DWQMS. Top Management is recommending that the Manager of Compliance and Regulations be identified as the Systems Management Representative.

The DWQMS Standard explicitly defines a Drinking Water System “Owner” as “every person who is a legal or beneficial owner of...the system”. Since the City’s Public Works Department is a publicly-owned organization, the Mayor and Council (as representatives of the public) act as Owners for the City’s Drinking Water System. Similarly, the DWQMS Standard defines “Top Management” as a “group of people at the highest management level within an Operating Authority”. Within the Public Works Department (i.e. the Operating Authority), the “Top Management” group members include the General Manager of Public Works and the Senior Director of the Water and Wastewater Division.

**ALTERNATIVES FOR CONSIDERATION:**

- **Alternatives to Recommendation A – DWQMS Policy as Enclosed in Appendix B**
  The DWQMS Policy contains the information required by the Standard. The Policy has to be supported by documented actions and known by all affected staff as well as the Owner and Top Management during the audits by the Accreditation Body.

  1) An alternatively worded Policy would need to contain all the minimum requirements contained within the recommended document and lend itself to easy recollection by all staff within the City’s water systems, including the owner (Mayor and Council).

  2) Another alternative to the Policy could be the change in graphical display of the information contained therein.

- **Alternatives to Recommendation B – Adoption of Option 2 for Implementation of AND Submission of Operational Plan by January 1, 2009**
  The two other options offered by the MOE under the DWQMS are as follows:

  **Option 1:** Submit a scoped Operational Plan covering “Plan” and “Do” activities for select elements as an “Option 1” submission. This alternative is not recommended by staff. This option offers a partial implementation of only select elements and for purposes of cultural changes across the Division and minimal disruption of vital operations alternative 2 would be a more realistic goal. Some of the elements singled out in this option would not be met with the current resources.

  **Option 2:** Submit a full operational plan as an “Option 3” submission, covering “Plan” and “Do” activities for all 21 elements. This is not recommended by staff. The City’s operations are large enough that staff do not feel that this option is possible with the existing, proposed, and even increased resource component, without significantly increased cost or without jeopardizing other vital City water operations.
Alternative to Recommendation C – Designation of the Manager of Compliance and Regulations Section in WWW Division of Public Works, as the Senior Management Representative for the DWQMS

An alternative to this designation could be other staff with equal or similar qualifications, with the skills, knowledge, and experience, position and support in the organization such as that of the current Manager of Compliance and Regulations. The choice of another member for this responsibility is not recommended by staff, as the infrastructure already created for the position of Manager of Compliance and Regulations, her position’s current responsibility and staff already specifically in place to support the implementation of the DWQMS lend itself to a smooth and efficient effort and best results.

**FINANCIAL/STAFFING/LEGAL IMPLICATIONS:**

**Financial**
The planning and implementation of the DWQMS will require internal and external resources. The Water and Wastewater Division has retained a consultant to manage the DWQMS project and assist the City in meeting the January 1, 2009 submission deadline for the Operational Plan. The consultant will assist the Manager of Compliance and Regulations and act as an overall Program Manager. Based on the Division’s review of the elements of the DWQMS Standard, additional external expertise will likely help to meet the specific requirements of some of the DWQMS elements. The DWQMS Program Manager will assist the City in scoping out the additional work required and ensuring the product meets the requirements of the DWQMS Standard. The overall “Plan” and “Do” external costs could be in the range of $250,000 to $300,000 over a 2.5 year timeframe which includes development of Operational Plan and procedures, a drinking water system risk assessment, internal audits, and the third-party Verification Audit by the Accreditation Body. The cost estimate is preliminary based on final/draft upcoming Ministry of the Environment regulations and estimated staffing levels within the Water and Wastewater Division. At this point, the Ministry of the Environment is not offering any support funding for DWQMS projects, and therefore this will be funded from the Rate Budget.

**Staffing**
The Water and Wastewater Division has been allocating internal resources to support the DWQMS project. The Systems Management Representative will monitor resources needs of the DWQMS project on an ongoing basis and notify Top Management and the owner of the DWQMS if further internal staff resources are required.

**Legal Implications**
The DWQMS Standard was approved in October 2006. In addition, Ontario Regulation 188/07 entitled “Licensing of Municipal Drinking-Water Systems” is now prescribed by law (May 2007). Ontario Regulation 188/07 confirms that municipal drinking water systems will require a drinking water systems licence and that the prescribed submission date for the City’s Operational Plan is January 1, 2009.

**POLICIES AFFECTING PROPOSAL:**

N/A
RELEVANT CONSULTATION:

Ministry of the Environment

The City of Hamilton provided comments on the draft DWQMS standard and proposed regulations in 2006, when they were posted for comment on the Environmental Bill of Rights website. Some of the comments provided were addressed in the final DWQMS Standard and licensing regulation.

Other Large Ontario Municipalities

Public Works staff are networking with other Ontario Municipalities. This consultation provides an opportunity to facilitate the exchange of information related to implementation and compliance with DWQMS standard and other water related issues. Select municipalities have been working with the Ministry of the Environment as volunteers to develop their DWQMS and simultaneously test the draft DWQMS Standard. These municipalities have initiated their DWQMS projects over a year ago and have selected an Option 3 submission (full Plan & Do) due to this early start. Most Ontario municipalities are in the process of deciding on which option best meets their available resources and operational challenges.

CITY STRATEGIC COMMITMENT:

By evaluating the “Triple Bottom Line”, (community, environment, economic implications) we can make choices that create value across all three bottom lines, moving us closer to our vision for a sustainable community, and Provincial interests.

Community Well-Being is enhanced.  ☑Yes  ☐ No
The City will be in compliance with the Safe Drinking Water Act, 2002 and its DWQMS standard requirements and continue to provide safe, clean drinking water.

Environmental Well-Being is enhanced.  ☑ Yes  ☐ No
The City’s water treatment and distribution facilities will have a greater opportunity for continuous improvement through the implementation of the DWQMS.

Economic Well-Being is enhanced.  ☑ Yes  ☐ No
Adoption of legal requirements will ensure that the City can hold a licence to control and operate its own water facilities. There will also be no legal fines associated with lack of the DWQMS or last minute attempts to create one. As it is we are on the right track for success.

Does the option you are recommending create value across all three bottom lines?  ☑Yes  ☐ No

Please see comments above.

Do the options you are recommending make Hamilton a City of choice for high performance public servants?  ☑ Yes  ☐ No
The requirements set forth by the DWQMS will require a culture change in the staff working within the system. This is challenging work, requiring attention to quality of operations and pride in our accomplishments.
Beyond Compliance Operating System

Environmental, Quality, Health & Safety
Due Diligence System* (ISO 14001, CSA Z1000)

Environmental Lab QMS
• Quality of Laboratory Processes & Tests (ISO 17025)

Drinking Water QMS
• Quality of Water (MOE DWQMS Standard)

Biosolids QMS
• Quality of Biosolids (Ontario Biosolids Program)
The City of Hamilton owns, maintains and operates various drinking water systems.

The City is committed to:

- Safe, high quality, consistent supply of drinking water;
- Always improving the Drinking Water Quality Management System;
- Following and complying with applicable legislation;
- Effective and open communication with the community concerning matters of drinking water quality.