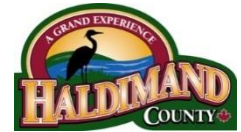

HALDIMAND COUNTY

Report PW-WW-03-2017 Drinking Water System Backflow Prevention Program



For Consideration by Committee of the Whole on December 7, 2017

OBJECTIVE:

To provide information to Council and obtain support to implement a Drinking Water System Backflow Prevention Program in Haldimand County.

RECOMMENDATIONS:

1. THAT Report PW-WW-03-2017 Drinking Water System Backflow Prevention Program and accompanying presentation be received;
2. AND THAT Council authorize the implementation of a Backflow Prevention Program for industrial, commercial and institutional properties connected to Haldimand County drinking water systems.

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EXECUTIVE SUMMARY:

Backflow can occur in a municipal drinking water system where potable water delivered to private plumbing, flows backwards into the municipal system. The water can be contaminated by cross connections located on private property. To protect municipal drinking water systems from backflow, backflow prevention devices are installed.

Currently, under the Ontario Building Code, new buildings must install the appropriate device for the intended use of the building. Industrial, institutional and commercial properties erected prior to the Ontario Building Code requirements coming into effect, may not have adequate protection installed. To address these properties, as well as ensuring proper maintenance of all installed backflow preventers, a Backflow Prevention Program is required.

Upon Council authorization of a Backflow Prevention Program, the last physical barrier identified in a multi-barrier approach will be in place. The program will support public health protection by protecting the distribution system from potential contamination. The County will also address outstanding Ministry of the Environment and Climate Change recommendations and new Drinking Water Quality Management requirements.

BACKGROUND:

The Safe Drinking Water Act, S.O., 2002 requires municipal water systems to supply water that meets prescribed regulatory standards. Through the Walkerton Inquiry, Justice O'Connor recommended that drinking water is best protected by taking an approach that uses multiple barriers to prevent contamination from affecting drinking water. As the potable (drinking) water provider, Haldimand County is committed to providing safe, reliable drinking water to the users of the County's municipal drinking water systems and has adopted a multi-barrier approach.

The multi-barrier approach attempts to address real and potential threats from source to tap, by ensuring barriers are in place to either eliminate or minimize their impact. This holistic approach recognizes that each barrier may not be able to completely remove a contaminant, but by working together, the barriers provide a high-level of protection.

Water Purveyors and Provincial Ministry Officials have identified industrial, commercial and institutional (ICI) cross connections as a potentially significant risk to distribution system integrity.

A cross connection is any actual or potential connection between a potable water system and any source of pollution or contamination. A connection between a municipal water system and a private cistern supply is an example of a cross connection. Every cross connection has the potential to contaminate the distribution system if a backflow incident occurs.

Backflow is the reversal of the normal direction of flow. There are two types of backflow.

- **Back-Siphonage** is the reversal of normal flow caused by a reduction in the municipal water system's pressure. This can be caused by fire fighting activities or watermain breaks.
- **Backpressure** is the reversal of normal flow due to the private water system pressure being higher than the municipal water system's pressure. This can be caused by service pumps or temperature increases in boiler systems.

Since 1989, the Ontario Building Code required all new buildings to install backflow prevention devices in the plumbing where it was deemed that the occupancy function within the building presents a risk of contamination to the distribution system. This was not retroactive and did not affect pre-existing buildings. It is suspected that there are a number of ICI properties in Haldimand County which do not have backflow prevention devices installed.

Many Ontario municipalities have passed by-laws and implemented programs to address risks associated with cross connections and backflow. The main objective of a Backflow Prevention or Cross Connection Program is to establish a method by which a municipality can identify private source cross connections and protect the municipal water system through the installation of backflow prevention devices.

ANALYSIS:

The Ministry of Environment and Climate Change (MOECC) has recommended through annual drinking water system inspections that Haldimand County take steps to identify all high risk ICI facilities within the distribution system and ensure backflow prevention devices are installed at these facilities. At the time of this report, there is no provincial regulatory requirement for a Backflow Prevention Program, however municipalities are asked to be proactive with respect to backflow prevention. Annually, Haldimand County is required to provide information on any cross connection control programs and identify all high risk users.

County staff updated the Water Use By-law in 2014 to include a section on backflow prevention and cross connections, which was approved by Council on January 20, 2014. These changes were important as they were a proactive step towards implementing a Backflow Prevention Program within Haldimand County.

On April 6, 2017 the MOECC approved revisions to Ontario's Drinking Water Quality Management Standard (DWQMS) which requires municipalities to consider specified hazardous events, including distribution system backflow, as part of their next mandatory risk assessment. Through the risk assessment, the County must identify control measures to address these potential hazardous events. Haldimand County must complete a risk assessment in 2018.

To address MOECC recommendations and DWQMS requirements, Water and Wastewater Operations Division staff are proposing to implement a Backflow Prevention Program in Haldimand County. The proposed program will also support continued public health protection by reducing the risk of distribution system contamination.

The proposed program will apply to all ICI buildings connected to municipal water in Haldimand County, including properties owned by the County. Through the program, property owners identified as posing a high risk to the municipal water system, will be required to have adequate backflow prevention devices installed at the property line or a point where the water service pipe enters the building or facility. This is known as **premise isolation**.

To ensure effective delivery of the program, Water and Wastewater Operations are proposing an approach consisting of three phases.

Phase 1 – Property Review

Water and Wastewater Operations obtained a list of all ICI properties connected to the municipal drinking water system that are currently billed for water. According to the Canadian Standards Association (CSA), cross connections are classified into three hazard levels:

- **Minor Hazards** are cross connections or potential cross connections that involve a substance that constitutes only a nuisance and that results in a reduction in only the aesthetic qualities of the water.
- **Moderate Hazards** are any minor hazard connections that have a low probability of becoming a high hazard. Examples include potential back siphoning or back pressure from high rise apartment buildings, commercial premises, irrigation systems, or schools.
- **High/Severe Hazards** are any cross connections or potential cross connections involving water that has additives or substances that, under any concentration, can create a danger to health. Examples include potential back siphoning or back pressure from chemical plants, car washes, food processing plants, hospitals, mortuaries or morgues.

A desktop analysis was conducted using the CSA standards "Guide to Degree of Hazard – Premises" and the ICI property list. One hundred and twenty-six (126) properties were determined to be potentially high hazard. The Water and Wastewater Operations Division is responsible for twenty-one (21) of these properties and has completed the backflow review internally. As will be discussed, the remaining 105 properties are privately owned with the backflow review to be completed by an external consultant pending approval from Council.

Phase 2 – Cross Connection Surveys

An essential component of a Backflow Prevention Program are cross connection control surveys. The survey assesses each water service connection and identifies any hazards and control measures for each hazard. Control measures can include installing a backflow prevention device or creating a physical separation between the water connection and hazard.

Phase 2 of the proposed County program involves verification of the previously completed desktop analysis to confirm the hazard level of each property. To support this project phase, staff have identified a project in 2018 to fund the cross connection control surveys.

Staff will procure a certified contractor to complete a cross connection control survey on all properties deemed potentially high hazard. The County will also provide project oversight during the duration of this activity, as there is a duty of care to ensure project success. A cross connection survey report and recommendations will be provided for each property, which will be used to determine which properties require a backflow prevention device or may already have a backflow prevention device installed.

To show due diligence for County water and wastewater infrastructure, Water and Wastewater Operations had cross connection surveys completed on all water and wastewater facilities. The inspector was asked to review the property hazard level, existing backflow devices and provide a summary of any deficiencies. Deficiencies identified through the surveys have been noted and a plan to address them has been developed using recommendations provided by the inspector.

Phase 3 – Backflow Prevention Program

Using information obtained from the cross connection control surveys, staff will confirm which properties have been deemed high hazard. Properties will either be required to have their existing backflow device tested to ensure it is functioning properly or to install a new backflow prevention device. Property owners will be contacted and provided an information package identifying their requirements through the program.

During this phase of the program, facility operators and/or property owners will be responsible to purchase and install a backflow prevention device and/or have their backflow prevention device tested and certified. The cost will vary depending on the size and complexity of the installation and needs to be completed by a certified, licensed contractor. Test reports will need to be submitted to Water and Wastewater Operations staff upon completion.

Once phase three has been completed and all high hazard properties have been adequately protected with a backflow prevention device, it will be the owner's responsibility to ensure that the device is maintained according to the manufacturer's specifications. Water and Wastewater Operations will require proof that each backflow prevention device has passed an annual inspection. This will ensure that each device is functioning properly and providing adequate protection from backflow.

LEGAL IMPLICATIONS:

A legal services review was obtained from Sullivan Mahoney LLP to provide recommendations regarding the proposed Backflow Prevention Program. The following was noted in their feedback to the County:

- There is a potential for both civil liability and regulatory charges if a backflow incident were to occur. Risk of liability will be significantly minimized if a program is implemented.
- Phase 2 of the program does not constitute municipal bonding.
- Haldimand County must exercise reasonable care in hiring a contractor and ensure that the work is carried out without negligence.

- The County should not be involved, physically or financially in backflow prevention device installations due to a greater liability risk.

FINANCIAL IMPLICATIONS:

Program management will be administered by the Water and Wastewater Operations Division. In addition to staff time required to answer questions and concerns regarding the implementation of the program, staff time will be required for program follow-up. It is expected that the existing complement of staff can absorb this additional workload without a reduction in service levels.

In consultation with contractors certified to perform cross connection control surveys, typical contractor rates range from \$100 to \$150 (not including non-rebateable HST) to complete a premise isolation cross connection control survey. This fee will vary depending on the complexity of the property. There will also be costs for postage, printing and scheduling. To support cross connection control surveys for the one hundred and five (105) privately owned potentially high hazard properties, a budget of \$25,000.00 has been identified in the 2018 Draft Rate Supported Capital Budget.

Property owners impacted by Phase 3 of the proposed program will be responsible for all costs associated with the purchase, installation and annual inspection and/or maintenance of their backflow prevention device(s). These costs will vary depending upon the size and complexity of the installation.

STAKEHOLDER IMPACTS:

Not applicable.

REPORT IMPACTS:

Agreement: No

By-law: No

Budget Amendment: No

Policy: No

ATTACHMENTS:

None.