

CITY OF ORILLIA

TO: Council Committee
FROM: Andrew Schell, Manager, Environmental Services
Peter Dance, Director of Public Works
REPORT NO.: PW-06-001
DATE: January 3, 2006
SUBJECT: **CROSS-CONNECTION CONTROL AND BACKFLOW PREVENTION**

Recommendation

THAT the attached Cross-Connection Control and Backflow Prevention Policy be adopted.

THAT Item 16 of the 2006 Water & Wastewater rates, "New water meter with backflow prevention up to 20 mm and its associated cost", be adopted by Council.

AND THAT the Policy and the new fee become effective February 1, 2006.

Background

A cross-connection is defined as "any actual or potential connection between a potable water system and any source of pollution or contamination" (CSA, 2003). Cross-connections are present in every water supply system. Any cross-connections that are not protected against backflow are potentially a dangerous source of contamination. When backflow (a flowing back or reversal of the normal direction of flow) occurs through an unprotected cross-connection, pollutants or contaminants can enter the municipal water system. Due to the resulting health hazards, it is important for the municipality to have an effective cross-connection control program (CCCP) in place.

In the 2005 Orillia Water Supply Municipal Inspection Report, the Ministry of Environment noted in the "Distribution" analysis section:

- No bylaw in place to prohibit cross-connections
- Backflow preventers are not installed at each lateral connection to major industries

In the "Summary of Best Practices Issues" section of the report, the above two comments were again noted.

In the “Recommended Actions” section of the report, it was noted:

- A bylaw to prohibit cross-connections in the distribution system should be developed

This report provides information regarding present status and future expectations with respect to a cross-connection control program.

In a previous report dated September 17, 2005, “Water and Sewer Fees and Rates”, a provisional item “16” was added to the 2006 rates. The previous report read as follows:

“New Water Meter with Backflow Prevention up to 20 mm

This is a provisional item. It will only be effective if the City adopts proposed standards for backflow protection. Staff is forwarding a fee item now so that the fee process does not have to be repeated if the recommendations of a subsequent report are adopted.

The City may require the installation of a water meter in each new domestic service connection, which will include a backflow prevention device to protect the distribution system from contamination. The arrangement will also require a thermal expansion tank in the same unit to eliminate problems associated with the hot water heater. The cost of the new water meter with check valve and expansion tank all in one unit is \$215.00.”

Analysis and Options

In April 2005, the National Guide to Sustainable Municipal Infrastructure Innovations and Best Practices (Infraguide) published “Methodology for Setting a Cross-Connection Control Program”. This document outlines the best practice for setting up a new program.

The National Plumbing Code of Canada (NRG1995b) requires connections to potable water systems be designed and installed so non-potable water or substances that may make the water non-potable cannot enter the potable water system. CAN/CSA B64.10-01 (CSA, 2003) Manual for the Selection and Installation of Backflow Prevention Devices provides detailed information about backflow, back siphonage and cross-connections and the potentially dangerous source of contamination.

The CSA 2003 standard defines the health hazard levels as:

- a) minor hazard - a nuisance, with no possibility of health hazard
- b) moderate hazard- minor hazard with low probability of becoming a severe hazard
- c) high or severe hazard- any potential cross-connection involving any substance that could be a danger to health.

For example, a flexible shower head with a hose connection may be considered a minor hazard, swimming pools and laundry machines may be considered a moderate hazard, and many industries may be considered a severe hazard. The CCCP policy and bylaw that will be presented to Council later in 2006 will follow the methodology set out by Infraguide. This best practice addresses cross-connection control programs for all Canadian municipalities. This is a 15 step program starting with establishing authority and administrative responsibility, establishing budgets, public relations, training and completing the program with performing quality control and program assurance, just to name a few.

The program will be phased in over time as suggested by Infraguide. The phasing will address severe risk connections and municipal facilities first. The severe risk needs to be addressed as a priority since they involve substances that could be an immediate danger to public health. City facilities will be addressed as well to “lead by example” and gain information to improve the program as it progresses through its initial phases. CAN/CSA B64.10-01 provides a guide to the Assessment of Hazards, which will be used to assess all service connections to the city potable water supply to assign the degree of hazard potential as minor, moderate or severe. Moderate hazards will be phased in after the severe potential hazards have been addressed. While the minor hazard is the lowest of concern, it is best to implement on all new construction and renovations as it provides the most cost effective approach at the start of a new project rather than retrofitting after the fact.

The request to Council at this time is to approve residential backflow prevention which is considered a minor health hazard. This will only apply to new construction at this time. As part of the meter package, a backflow device and an expansion tank will be provided. The unit to be provided will be an approved (CSA) Dual Check Valve Backflow Preventer (DuC), which consists of two independently active, internally loaded check valves in series. The packages will also include a Water Expansion tank which is designed to absorb the increased volume of water created when water is heated. The DuC backflow preventer is used to prevent backflow due to back siphonage and back pressure where a minor hazard exists. This device is designed to be used on residential services. In addition to preventing damage due to hot water expanding and preventing contamination of the municipal supply, the package will prevent collapse of hot water tanks in the event of a major watermain failure.

It is felt that with the increased residential growth within the city that this program should start as soon as possible. Since it is the ultimate goal to have backflow prevention for all services, it is important to start now with new construction to minimize the costs.

Summary

With an effective program, the City of Orillia will provide increased potable water protection, which will reduce risks to public health, demonstrate due diligence and regulatory compliance, reduce liability and increase consumer confidence and heighten cross-connection awareness.

Prepared and Recommended by:

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**CITY OF ORILLIA
CROSS-CONNECTION CONTROL AND BACKFLOW PREVENTION POLICY**

1. The goal of the City is for all service connections to the City's water distribution system to be equipped with appropriate backflow prevention devices.
2. For the existing residential connections, high costs to retrofit with backflow protection and limited risk to the system is recognized.
3. Backflow devices shall be provided and maintained at the owner's expense for all new construction effective for water connection applications after February 1, 2006. For these services, this will be a condition of continued connection to the City's distribution system.
4. An implementation, reporting and inspection bylaw will be developed for existing connections to phase in backflow prevention starting with the highest risk connections.

January 3, 2006