

What's New? Ontario Watermain Disinfection Procedure

Course Overview

- **Introduction**
- **How it all started**
- **Why make a change?**
- **Revisions to the procedure.**
- **Group brainstorming session**
- **Discussion and review**

Course Learning Objectives

Participants will have the ability to:

- ✓ Be able to identify improvements made to the disinfection procedure
- ✓ Be able to implement the necessary changes to their operational plan or SOP's in order to meet the new requirements
- ✓ Understand the Operating Authorities responsibilities under the standard

Introduction

- ✓ Updated Watermain Disinfection Procedure released for use August 1, 2020.
- ✓ Operating Authorities must implement in accordance with timing of DWWL Renewal
- ✓ Operating Authorities may implement early (with approval)

How it all Started

BACKGROUND, 2015 WATERMAIN DISINFECTION PROCEDURE

Ontario Developed 2015 Watermain Disinfection Procedure

- ✓ Categorization of watermain breaks based on risk of contamination
- ✓ Requirement for OIC to determine category and document
- ✓ Agency Notification and reporting of observation of improper disinfection, Sch. 16-4
- ✓ Watermain Break Common Disinfection Procedures
- ✓ Documentation requirements for maintenance and repair activities for appurtenances and fittings, and emergency repairs (Section 4)

Categorization Watermain Disinfection Procedures for Emergency Repairs

- Categorization of watermain breaks based on risk of contamination, before or after flow reduction following break:
- Category 1, no “evident or suspected contamination intrusion”
- Category 2, there is “evident or suspected contamination intrusion”

Why Make A Change?

225 comments from 32 municipalities Identified for Changes to Ministry's Watermain Disinfection Procedure (WDP), since 2015

Focus of previous document was watermain breaks/emergency repairs, proposed revisions more focused on new watermain construction/replacement

Proposed exceptions to ANSI/AWWA C651 for new watermains to address public safety and constructability issues in transportation corridors

Proposed clarification of disinfection, sampling, certified operator requirements for new watermain commissioning

Proposed clarification of main break categorization, and disinfection requirements

Proposed addition of documentation requirements for new/replacement watermains, and amendments to watermain break documentation

Revisions to Procedure

- Sections have been edited and moved for ease of use
- Definitions
- Backflow Prevention
- Microbiological sampling
- Final Connections
- Planned Maintenance, cleaning, Inspection
- Return to Service of Isolated Watermains
- Categorization and Post Repair Flushing
- Documentation and Appendix's
- Note: not all changes reflected as noted above

Examples of Definition Amendments

“Directly Supervised” (NEW) means directly supervised within the meaning of Section 5.1.1 of the Certification Guide for Operators and Water Quality Analysts of Drinking Water Systems, as amended, but it does not expressly refer to the definition of supervisor under the Occupational Health and Safety Act.

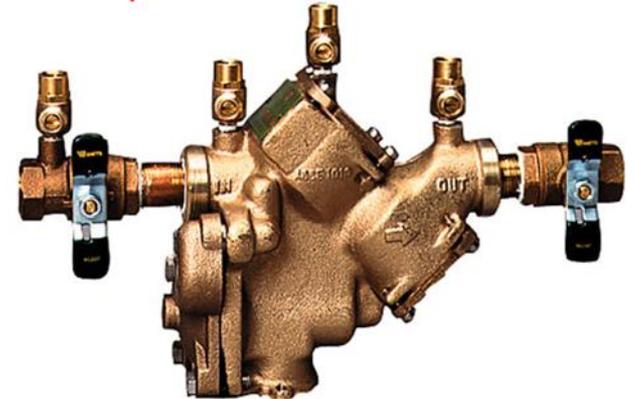
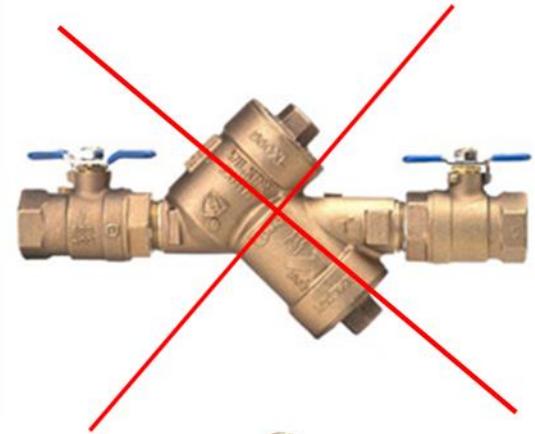
“Flushing” (2015 Version) means post repair valve operation to restore secondary disinfection and discharge suspended materials by flowing water through the repaired section of watermain and out of the system. This definition does not include recharging the watermain or a requirement to achieve scouring velocity within the watermain.

“Flushing” NEW means flowing water through a section of watermain/appurtenances and out of the system until the water appears visibly free from discoloration and particulates with an *Acceptable Disinfectant Concentration*. This definition does not include recharging a watermain.

1.1.1. Backflow Prevention for New Watermains

Backflow Prevention shall be accomplished as per CSA **B64.10** Selection and Installation of Backflow Preventers:

- An air gap or reduced pressure (**RP**) backflow preventer selected, installed and tested in accordance with B64.10
- Double check valve assembly (**DCVA**) no longer accepted
- **RP** device must be field tested in accordance with **B64.10**
 - **(NEW) Exception: if device relocated within the same day, testing only required for the first installation of the day**
- **Tester's Licence** shall be **OWWA** Certified Cross Connection Control Specialist, include certified operator or water quality analyst with tester's licence



1.1.3. Microbiological Samples for New Watermains (New/Revised)

- The Operating Authority shall ensure that the *Microbiological Samples* taken in accordance with ANSI/AWWA Standard C651 include as a minimum *Escherichia coli* and Total Coliforms **and are tested by a licensed and accredited laboratory.** When *Microbiological Samples* are taken from new watermains that have not been placed into service, **Operating Authorities shall ensure that additional samples are taken at the same time from the same location and are tested immediately for:**
 - **(a) free chlorine residual, if the system provides chlorination and does not provide chloramination; or**
 - **(b) combined chlorine residual, if the system provides chloramination.**
- These *Microbiological Samples* and disinfectant residual tests are **not considered *Drinking Water* tests for the purpose of the Safe Drinking Water Act (SDWA), and are, therefore, not reportable. Any person authorized by the owner or Operating Authority can collect *Microbiological Samples* from watermains that have **not been placed into service** and perform the associated disinfectant residual tests.**

1.1.4.1 Connections Equal to or Less than One Pipe Length (Generally ≤ 6 m) (NEW)

- *The Operating Authority shall ensure that Connections equal to or less than one pipe length (generally ≤ 6 m) are undertaken in accordance with Section 4.10.1 of ANSI/AWWA Standard C651 and that the Connection remain Isolated from the existing Drinking Water System, except while being flushed or sampled, **until satisfactory results are received from one Microbiological Sample**, taken by a Certified Operator or Water Quality Analyst, from water that has been directed through the Connection.*
- *Exception: If a Certified Operator is present to witness the installation and disinfection of the Connection to ensure that the sanitary construction practices and disinfection requirements of Sections 4.10 and 4.10.1 of ANSI/AWWA Standard C651 were met, then the Connection can be placed into service with no Microbiological Sample required.*

1.1.4.2 Connections Greater than One Pipe Length (Generally > 6 m) (NEW)

- *Connections greater than one pipe length (generally > 6 m) shall be undertaken in accordance with Section 4.10.2 of ANSI/AWWA Standard C651.*
- **Exception: The procedure described below may be used at the discretion of the Operating Authority for the installation and disinfection of Connections greater than one pipe length and up to a total length of 40 m if the Connection:**
 - a. Crosses a transportation corridor, the extended closure of which could result in significant community impacts (e.g., traffic congestion, loss of emergency vehicle access, safety concerns), or
 - b. Cannot be constructed to within one pipe length of the existing watermain due to the potential for destabilizing an existing thrust block.

1.1.4.3 Placing New Watermains into Service(NEW)

- **Valves** opened to place a new watermain into service shall, in all cases, be operated by a **Certified Operator**. As part of placing a watermain into service, Flushing through the Connection shall be performed until a Certified Operator or a Water Quality Analyst verifies that an Acceptable Disinfectant Concentration is present in the new watermain. If Microbiological Samples are taken and/or disinfectant residual tests are performed after a watermain is placed into service, they are considered as Drinking Water tests for the purpose of the SDWA and adverse test results are reportable.

1.3. Planned Watermain Inspection and Cleaning (REVISED)

- **All equipment used for the inspection of watermains shall be dedicated for that purpose only, and shall be suitable for disinfection. Sanitary practices shall be followed to prevent the introduction of Contaminants into the watermain. All inspection equipment inserted into a watermain (e.g., electromagnetic, acoustic, or video inspection equipment) shall be cleaned and disinfected using a minimum 1% sodium hypochlorite solution immediately prior to insertion. Drinking Water shall be used for equipment cleaning and/or preparation of hypochlorite solutions. Disinfectant residual testing shall be performed upon removal of the inspection equipment. Flushing shall be performed if an Acceptable Disinfectant Concentration was not maintained.**

1.5. Tapping of Watermains

- **(NEW)** The live tapping (i.e., “wet” tapping) of a watermain that is part of the Drinking Water System must be performed by a Certified Operator; however, a person or contractor who is not a Certified Operator may perform wet taps provided they are being Directly Supervised by a Certified Operator. The Operating Authority shall maintain records of the name of the Certified Operator present for the wet taps.

1.7 Return to Service of Watermains Isolated from the Distribution System (NEW)

- Where a section of watermain has been Isolated from a Drinking Water System and a concentration of 0.05 mg/L of free chlorine residual in a chlorinated system (or 0.25 mg/L of combined chlorine residual in a chloraminated system) **was not maintained within the Isolated section** (e.g., a valved-off stub), the Operating Authority shall develop and implement a **re-commissioning plan that reflects the duration of isolation and the associated risks**. The plan may include the implementation of Sections 1.1.2, 1.1.3, and/or 1.1.4 of this procedure. At a minimum, the plan must include:
 - Flushing through the Isolated section of watermain; and
 - Satisfactory test results to be received from at least one Microbiological Sample prior to the Isolated watermain being placed into service.
- The Operating Authority shall keep a copy of the **re-commissioning plan and maintain records** showing that all items required by the re-commissioning plan were satisfactorily completed.
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2.1 Categorization Watermain Disinfection Procedures for Emergency Repairs (Revised)

- Categorization of watermain breaks based on risk of contamination, before or after flow reduction following break:
- Category 1, no “evident or suspected contamination”
- Category 2, there is “evident or suspected contamination”
 - Repairs of more than 6 metres of replaced pipe classified as Category 2



All watermain breaks shall be classified as **Category 2** as per Section 2.1.2 of this procedure **unless** an Operator-in-Charge (OIC) conducts a visual inspection upon completion of the excavation to determine the nature of the watermain break and classifies it as a Category 1 as per Section 2.1.1.

The OIC shall assess the evidence of Contamination or suspected Contamination of the watermain **throughout** the repair procedure and shall reclassify if required.



Documentation for New Watermains

- Now applies to **new watermain/planned replacement** installation, **s3.1**
- Record keeping requirements of Reg. 128/03, and Condition 13, Sch. B of MDWL
 - Not all information has to be on single form
- Documentation overview:
 - *Backflow Prevention* (Air gap, RP, testing as per 1.1.1)
 - Swabbing and/or flushing completed
 - Disinfection process
 - Method of disinfection (Table 1, s1.1.2 of WDP)
 - Date/time started/ended
 - Chlorine residual at start/end



Documentation for New Watermains

- *Microbiological Sampling*
 - **Schematic** showing location of sample
 - Microbiological and disinfectant residual sample results
 - **Staged sampling**
 - **Flowrate, time of each sample and calculated length**

- **Content**



Documentation for New Watermain

- ***Connections*** referred to in Section 1.1.4:
 - **Length of *Connection***;
 - **Confirmation whether sanitary construction practices were followed**;
 - **Confirmation that proper disinfection was performed**;
 - **Name of *Certified Operator* present for the installation of the *Connection* if required**;
 - **Results of *Microbiological* and disinfectant residual samples if required**;
 - **Reason for using the exception under s. 1.1.4.2 (if used)**;
 - **Disinfectant residual after watermain is flushed and put in service; and**
 - **Date and time watermain was placed into service.**

Documentation for Watermain Maintenance and Repair

- No evident or suspected *Contamination* of the watermain was observed before or during the repair process.
- Name of *Operator-in-Charge* who classified the watermain break as **Category 1 (if applicable)**.
- Post-repair *Flushing* undertaken (if applicable).
- For Category 2 – Special Cases, include site-specific plan. If chlorine disinfection was used, indicate initial concentration, contact time, final concentration and final concentration as percentage of initial concentration.

Appendix's

- Appendix A – Examples of BF prevention and Schematics for installation
- Appendix B – example of exception connection greater than one pipe length
- Appendix C – Revised categorization flow chart
- Appendix E – Revised Cat 1 Flowchart
- Appendix F – Revised Cat 2 Flowchart
- Appendix G– Revised Special Case Flowchart
- Appendix H – Revised Definitions

Responsibility

- The owner and operating authority must meet the minimum requirements
- Exceptions are at the discretion of owner and operating authority
- If you wish to implement the new procedure prior to renewing MDWL and updating DWWP you must complete request for early implementation form

Group Brainstorming



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