



WIARTON DRINKING WATER SYSTEM  
897 BAYVIEW ST, SOUTH BRUCE PENINSULA, ON, N0N  
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## Inspection Report

System Number: 220002681

Entity: ONTARIO CLEAN WATER  
AGENCY  
THE CORPORATION OF THE  
TOWN OF SOUTH BRUCE  
PENINSULA

Inspection Start Date: 01/10/2023

Inspection End Date: 02/10/2023

Inspected By: Robert Graham

Badge #: 1667



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(signature)

**NON-COMPLIANCE/NON-CONFORMANCE ITEMS**

The following item(s) have been identified as non-compliance/non-conformance, based on a "No" response captured for a legislative or best management practice (BMP) question (s), respectively.

**Question Group:** Other Inspection Findings

<b>Question ID</b>	MRDW1115001	<b>Question Type</b>	Legislative
<b>Question:</b>			
Were the inspection questions sufficient to address other non-compliance items identified during the inspection period?			
<b>Legislative Requirement</b>	Not Applicable		
<b>Observation/Corrective Action(s)</b>			
<p>The following instance(s) of non-compliance were also noted during the inspection:</p> <p>As identified previously in this report, the construction of new watermains, including the transfer of water service connections, occurred on Mary Street from Claude Street to Brown Street and on Mary Street from Brown Street to Issac Street during the inspection review time period, as documented in the Form 1 submitted by OCWA.</p> <p>Disinfection records for the above new watermain works were provided for review by OCWA and GM Blue Plan Engineering, who were retained by the Owner to commission the works, which identified that all parts of the drinking water system that came in contact with drinking water were disinfected in accordance with the ANSI/AWWA C651-14 and the MECP 2020 Watermain Disinfection Procedure (WDP). Section 3.1 of the 2020 WDP identifies minimum recordkeeping requirements for new watermains. The information shall be retained as per the record-keeping requirements of Section 27 of O. Reg. 128/04.</p> <p>Based upon an MECP review of the initially submitted documents, there was apparent missing recordkeeping information for the above works as required under the 2020 MECP WDP. The missing information was subsequently provided by GM Blue Plan Engineering, with exception of a schematic or drawing showing approximate location where Microbiological Samples were taken. OCWA has subsequently confirmed that an SOP entitled Watermain Commissioning was issued on 2021-02-01 which contains forms that would sufficiently document the above missing information.</p> <p>To ensure that minimum documentation requirements required under the 2020 WDP are met in the future, the Owner/OCWA are required to develop a procedure, a copy of which is to be provided to the aforementioned Provincial Officer on or before March 17, 2023, whereby contractors and consultants retained by the Owner to undertake disinfection works on behalf of the Owner/OCWA, are made aware of the SOP and 2020 WDP in</p>			

advance of undertaking watermain disinfection works thereby ensure that documentation of disinfection works are completed as required under the 2020 WDP.

## INSPECTION DETAILS

This section includes all questions that were assessed during the inspection.

**Ministry Program:** DRINKING WATER | **Regulated Activity:** DW Municipal Residential

Question ID	MRDW1001001	Question Type	Information
<b>Question:</b>			
What was the scope of this inspection?			
<b>Legislative Requirement</b>	Not Applicable		
<b>Observation</b>			
<p>The primary focus of this inspection is to confirm compliance with Ministry of the Environment, Conservation and Parks (MECP) legislation as well as evaluating conformance with ministry drinking water policies and guidelines during the inspection period. The ministry utilizes a comprehensive, multi-barrier approach in the inspection of water systems that focuses on the source, treatment, and distribution components as well as management practices.</p> <p>This drinking water system is subject to the legislative requirements of the Safe Drinking Water Act, 2002 (SDWA) and regulations made therein, including Ontario Regulation 170/03, "Drinking Water Systems" (O. Reg. 170/03). This inspection has been conducted pursuant to Section 81 of the SDWA.</p> <p>This inspection report does not suggest that all applicable legislation and regulations were evaluated. It remains the responsibility of the owner to ensure compliance with all applicable legislative and regulatory requirements.</p> <p>On January 10, 2023 Ministry of the Environment, Conservation and Parks (MECP) Provincial Officer Bob Graham conducted an unannounced focused inspection of the Warton Drinking Water System (DWS), which included the water treatment plant, the booster station and standpipe. The Warton DWS is a Large Municipal Residential System owned by the Town of South Bruce Peninsula (Owner) and operated by the Ontario Clean Water Agency (OCWA - OA). Assistance with the inspection was provided by Leo-Paul Frigault, OCWA Senior Operations Manager, Daniel Caesar, OCWA Operator and Karla Young, OCWA Process &amp; Compliance Technician. During the inspection review period, from January 7, 2022, the date following the previous inspection, to January 10, 2023, the date of the inspection, there were no Adverse Water Quality Incidents (AWQIs) reported to the MECP Spills Action Centre (SAC).</p> <p>The current Municipal Drinking Water Licence (MDWL) No. 094-102, Issue No. 4 and Drinking Water Works Permit (DWWP) No. 094-202, Issue No. 4 were issued on March 6, 2020 for the Warton DWS.</p>			

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<b>Question ID</b>	MRDW1000001	<b>Question Type</b>	Information
<b>Question:</b> Does this drinking water system provide primary disinfection?			
<b>Legislative Requirement</b>	Not Applicable		
<b>Observation</b>			
This Drinking Water System provides for both primary and secondary disinfection and distribution of water.			

<b>Question ID</b>	MRDW1018001	<b>Question Type</b>	Legislative
<b>Question:</b> Has the owner ensured that all equipment is installed in accordance with Schedule A and Schedule C of the Drinking Water Works Permit?			
<b>Legislative Requirement</b>	SDWA   31   (1);		
<b>Observation</b>			
The owner had ensured that all equipment was installed in accordance with Schedule A and Schedule C of the Drinking Water Works Permit.			
The equipment installed at the Warton DWS plant compares favourably to the equipment listed in the DWWP issued for the Warton DWS. The process flow diagram included in Schedule D of the Permit also appears to be accurate. All equipment described in the Permit appeared to be installed and operating on the date of this inspection, with exception of the activated carbon feed system for taste and odour control (which is described as functional but typically not used). There were no reported alterations undertaken during this inspection review period which required a Form 2 – Record of Modification or Replacement document to be prepared, nor did the Municipality undertake any alterations to the works which required Director Notifications to be made under Condition 2.4, Schedule B of the Permit. Watermain additions or modifications were undertaken which necessitated the completion of a Form 1 document during this inspection review period. There have been no modifications undertaken or additions made which required the completion of any Form 3 documents.			

<b>Question ID</b>	MRDW1020001	<b>Question Type</b>	Legislative
<b>Question:</b> Is the owner/operating authority able to demonstrate that, when required during the			

inspection period, Form 1 documents were prepared in accordance with their Drinking Water Works Permit?	
<b>Legislative Requirement</b>	SDWA   31   (1);
<b>Observation</b>	
<p>The owner/operating authority was in compliance with the requirement to prepare Form 1 documents as required by their Drinking Water Works Permit during the inspection period.</p> <p>Form 1 documents were prepared in accordance with the DWWP as follows:</p> <p>Construction of new watermains to replace the existing 150 mm diameter watermain on Mary Street from Claude Street to Issac Street at the locations noted below including the transfer of water service connections. The work is being completed as part of Contract No. 21-17R in Wiarton, Town of South Bruce Peninsula:</p> <ul style="list-style-type: none"> <li>-New 250 mm diameter watermain on Mary Street from Claude Street to Brown Street.</li> <li>-New 150 mm diameter watermain on Mary Street from Brown Street to Issac Street.</li> </ul>	

<b>Question ID</b>	MRDW1025001	<b>Question Type</b>	Legislative
<b>Question:</b>			
Were all parts of the drinking water system that came in contact with drinking water (added, modified, replaced or extended) disinfected in accordance with a procedure listed in Schedule B of the Drinking Water Works Permit?			
<b>Legislative Requirement</b>	SDWA   31   (1);		
<b>Observation</b>			
<p>All parts of the drinking water system were disinfected in accordance with a procedure listed in Schedule B of the Drinking Water Works Permit. Construction of new watermains to replace the existing 150 mm diameter watermain on Mary Street from Claude Street to Issac Street at the locations noted below including the transfer of water service connections. The work is being completed as part of Contract No. 21-17R in Wiarton, Town of South Bruce Peninsula:</p> <ul style="list-style-type: none"> <li>-New 250 mm diameter watermain on Mary Street from Claude Street to Brown Street.</li> <li>-New 150 mm diameter watermain on Mary Street from Brown Street to Issac Street.</li> </ul>			

<b>Question ID</b>	MRDW1024001	<b>Question Type</b>	Legislative
<b>Question:</b>			
Do records confirm that the water treatment equipment which provides chlorination or chloramination for secondary disinfection purposes was operated as required?			
<b>Legislative Requirement</b>	SDWA   O. Reg. 170/03   1-2   (2);		

<b>Observation</b>
<p>Records confirmed that the water treatment equipment which provides chlorination or chloramination for secondary disinfection purposes was operated so that at all times and all locations in the distribution system the chlorine residual was never less than 0.05 mg/l free or 0.25 mg/l combined.</p> <p>Following completion of the intended chlorine contact time for primary disinfection purposes, free available chlorine residual is maintained out and into the distribution system for secondary disinfection purposes to reduce the potential for microbial re-growth within the distribution system, and in accordance with section 1-5 of Schedule 1, O.Reg.170/03. DWS data reviewed during the inspection review period identified that the free chlorine residuals sampled/tested in the distribution system exceeded the minimum distribution system chlorine residual regulatory limit of 0.05 mg/L.</p>

<b>Question ID</b>	MRDW1038001	<b>Question Type</b>	Legislative
<b>Question:</b>			
Is continuous monitoring equipment that is being utilized to fulfill O. Reg. 170/03 requirements performing tests for the parameters with at least the minimum frequency specified in the Table in Schedule 6 of O. Reg. 170/03 and recording data with the prescribed format?			
<b>Legislative Requirement</b>	SDWA   O. Reg. 170/03   6-5   (1)1-4;		
<b>Observation</b>			
Continuous monitoring equipment that was being utilized to fulfill O. Reg. 170/03 requirements was performing tests for the parameters with at least the minimum frequency specified in the Table in Schedule 6 of O. Reg. 170/03 and recording data with the prescribed format.			

<b>Question ID</b>	MRDW1035001	<b>Question Type</b>	Legislative
<b>Question:</b>			
Are operators examining continuous monitoring test results and are they examining the results within 72 hours of the test?			
<b>Legislative Requirement</b>	SDWA   O. Reg. 170/03   6-5   (1)1-4; SDWA   O. Reg. 170/03   6-5   (1)5-10;		
<b>Observation</b>			
Operators were examining continuous monitoring test results and they were examining the results within 72 hours of the test.			
Continuous monitoring report results are printed, reviewed/examined by operators and			

signed on a daily basis and within 72 hours of the tests.

<b>Question ID</b>	MRDW1037001	<b>Question Type</b>	Legislative
<b>Question:</b> Are all continuous monitoring equipment utilized for sampling and testing required by O. Reg. 170/03, or MDWL or DWWP or order, equipped with alarms or shut-off mechanisms that satisfy the standards described in Schedule 6?			
<b>Legislative Requirement</b>	SDWA   O. Reg. 170/03   6-5   (1)1-4; SDWA   O. Reg. 170/03   6-5   (1)5-10; SDWA   O. Reg. 170/03   6-5   (1.1);		
<b>Observation</b>			
All continuous monitoring equipment utilized for sampling and testing required by O. Reg. 170/03, or Municipal Drinking Water Licence or Drinking Water Works Permit or order, were equipped with alarms or shut-off mechanisms that satisfy the standards described in Schedule 6.			
The Warton water treatment plant is equipped with continuous analyzers and alarms for free chlorine and turbidity. The alarm set points for the clearwell water chlorine analyzer is low 0.75 mg/L and low/low 0.70 mg/L; when triggered the system locks out ceasing water production, ensuring the system meets their CT requirements and allows time for an operator to intervene. The turbidity set points on the two filter trains is high 0.30 NTU and high/high 0.8 NTU at which time the plant shuts down ceasing water production until rectified. In both instances, the alarms are sent to OCWA operators notifying of the plant shutdown.			

<b>Question ID</b>	MRDW1040000	<b>Question Type</b>	Legislative
<b>Question:</b> Are all continuous analysers calibrated, maintained, and operated, in accordance with the manufacturer's instructions or the regulation?			
<b>Legislative Requirement</b>	SDWA   O. Reg. 170/03   6-5   (1)1-4; SDWA   O. Reg. 170/03   6-5   (1)5-10;		
<b>Observation</b>			
All continuous analysers were calibrated, maintained, and operated, in accordance with the manufacturer's instructions or the regulation.			
The potable water plant is equipped with continuous analysers for pH, chlorine residual, turbidity, and temperature. Analyzer verifications are completed by operators a minimum of once per month, or as needed to meet the manufacturer's recommendations, to ensure effective operation and accuracy. The calibration results are recorded in facility log books and monthly process and compliance status reports. Annual analyzer accuracy verification			



checks and calibrations were performed by HACH on May 3, 2022. Annual flow meters accuracy verification checks and calibrations were performed by IndusControl Incorporated on June 14, 2022.

<b>Question ID</b>	MRDW1108001	<b>Question Type</b>	Legislative
<b>Question:</b>			
Where continuous monitoring equipment used for the monitoring of free chlorine residual, total chlorine residual, combined chlorine residual or turbidity, required by O. Reg. 170/03, an Order, MDWL, or DWWP issued under Part V, SDWA, has triggered an alarm or an automatic shut-off, did a qualified person respond in a timely manner and take appropriate actions?			
<b>Legislative Requirement</b>	SDWA   O. Reg. 170/03   6-5   (1)1-4; SDWA   O. Reg. 170/03   6-5   (1)5-10; SDWA   O. Reg. 170/03   6-5   (1.1);		
<b>Observation</b>			
Where required continuous monitoring equipment used for the monitoring of chlorine residual and/or turbidity triggered an alarm or an automatic shut-off, a qualified person responded in a timely manner and took appropriate actions.			

<b>Question ID</b>	MRDW1033001	<b>Question Type</b>	Legislative
<b>Question:</b>			
Is the secondary disinfectant residual measured as required for the large municipal residential distribution system?			
<b>Legislative Requirement</b>	SDWA   O. Reg. 170/03   7-2   (3); SDWA   O. Reg. 170/03   7-2   (4);		
<b>Observation</b>			
The secondary disinfectant residual was measured as required for the large municipal residential distribution system.			
<p>The Warton DWS provides chlorination for secondary disinfection purposes in accordance with Section 1-5, Schedule 1, Ontario Regulation (O.Reg.) 170/03. There is currently no continuous monitoring of secondary disinfectant occurring within the distribution system and the municipality is required to conduct secondary disinfection monitoring by grab samples. Subsection 7-2 (3), Schedule 7, O.Reg.170/03 requires the Owner to ensure that at least seven distribution samples are taken each week and that those samples be tested immediately for free chlorine residual. Where secondary disinfection chlorine testing is not being conducted on a daily basis or by continuous monitoring, Subsection 7-2 (4), Schedule 7, O.Reg.170/03 requires that:</p> <ol style="list-style-type: none"> <li>1. At least four of the samples must be taken on one day of the week, at least 48 hours after the last sample was taken in the previous week.</li> </ol>			

2. At least three of the samples must be taken on a second day of the week, at least 48 hours after the last sample was taken on the day referred to in paragraph 1.
3. When more than one sample is taken on the same day of the week under paragraph 1 or 2, each sample must be taken from a different location.

Records provided by OCWA and reviewed during the inspection indicate that OCWA complied with these requirements, typically testing free chlorine residual for secondary disinfection monitoring purposes from 2 locations 7 days a week. On the date of this inspection, OCWA operators measured the free available chlorine residual in the distribution system at three locations and found the free available chlorine residual to be adequate with results of 0.99 mg/L at the Jenny Flush Line, 1.29 mg/L at Pump Station No. 1 and 1.15 mg/L at the Filter Building.

Question ID	MRDW1099001	Question Type	Information
<b>Question:</b>			
Do records show that all water sample results taken during the inspection review period did not exceed the values of tables 1, 2 and 3 of the Ontario Drinking Water Quality Standards (O. Reg. 169/03)?			
Legislative Requirement	Not Applicable		
<b>Observation</b>			
Records showed that all water sample results taken during the inspection review period did not exceed the values of tables 1, 2 and 3 of the Ontario Drinking Water Quality Standards (O. Reg. 169/03).			

Question ID	MRDW1081001	Question Type	Legislative
<b>Question:</b>			
For LMR systems, are all microbiological water quality monitoring requirements for distribution samples being met?			
Legislative Requirement	SDWA   O. Reg. 170/03   10-2   (1); SDWA   O. Reg. 170/03   10-2   (2); SDWA   O. Reg. 170/03   10-2   (3);		
<b>Observation</b>			
All microbiological water quality monitoring requirements prescribed by legislation for distribution samples in a large municipal residential system were being met.			
The owner of a large municipal residential drinking water system shall ensure that if the system serves a population of 100,000 or less, at least 8 distribution samples plus one for every thousand people served by the system are taken every month. At least one of the samples must be taken each week. As Wiarton's DWS population is estimated to be 2300			

residents, ten samples must be collected from the distribution system on a monthly basis at a minimum. These samples are required to be tested for E.Coli. and total coliform; and at least 25 percent of the samples are required to be tested for general bacteria populations expressed as colony counts on a heterotrophic plate count. Records obtained indicate that the Owner is routinely collecting three distribution samples each week in order to comply with, and exceed, the regulatory requirement. Each of those samples were tested for E. Coli., total coliform, and approximately one third of the samples were tested for general bacteria populations expressed as colony counts on a heterotrophic plate count. There were no concerns identified with the results obtained.

<b>Question ID</b>	MRDW1096001	<b>Question Type</b>	Legislative
<b>Question:</b> Do records confirm that chlorine residual tests are being conducted at the same time and at the same location that microbiological samples are obtained?			
<b>Legislative Requirement</b>	SDWA   O. Reg. 170/03   6-3   (1);		
<b>Observation</b> Records confirmed that chlorine residual tests were being conducted at the same time and at the same location that microbiological samples were obtained.			

<b>Question ID</b>	MRDW1086001	<b>Question Type</b>	Legislative
<b>Question:</b> Are all haloacetic acid water quality monitoring requirements prescribed by legislation conducted within the required frequency and at the required location?			
<b>Legislative Requirement</b>	SDWA   O. Reg. 170/03   13-6.1   (1); SDWA   O. Reg. 170/03   13-6.1   (2); SDWA   O. Reg. 170/03   13-6.1   (3); SDWA   O. Reg. 170/03   13-6.1   (4); SDWA   O. Reg. 170/03   13-6.1   (5); SDWA   O. Reg. 170/03   13-6.1   (6);		
<b>Observation</b> All haloacetic acid water quality monitoring requirements prescribed by legislation were conducted within the required frequency and at the required location.  Section 13-6.1 (1) of Schedule 13, O.Reg.170/03 requires the Owner/OCWA to ensure that at least one distribution sample is taken every 3 months from a point in the drinking water system's distribution system that is connected to the drinking water system, that is likely to have an elevated potential for the formation of Haloacetic Acids (HAA), and tested for HAAs. Section 6-1.1 of Schedule 6, O.Reg.170/03 requires that these samples be taken at least 60 days, and not more than 120 days, after a sample was taken for that purpose in the previous three month period. A drinking water quality standard of 80 micrograms per			

Litre (ug/L) for haloacetic acids took effect under O.Reg.169/03 "Ontario Drinking Water Quality Standards" (ODWQS) on January 1, 2020. It is expressed as a Running Annual Average (RAA), where the RAA is defined as the average for quarterly HAA results for a drinking water system. HAAs will generally form at the beginning of the distribution system. Sampling for the inspection period occurred on April 4 (15.50 ug/L), July 5 (17.0 ug/L) and October 3, 2022 (22.60 ug/L) and January 3, 2023 (19.20 ug/L). The inspection review period RAA concentration for HAAs in the Wiarton DWS is 18.57 ug/L. The Ontario Drinking Water Quality Standard is a RAA concentration of 80 ug/L.

<b>Question ID</b>	MRDW1087001	<b>Question Type</b>	Legislative
<b>Question:</b> Have all trihalomethane water quality monitoring requirements prescribed by legislation been conducted within the required frequency and at the required location?			
<b>Legislative Requirement</b>	SDWA   O. Reg. 170/03   13-6   (1); SDWA   O. Reg. 170/03   13-6   (2); SDWA   O. Reg. 170/03   13-6   (3); SDWA   O. Reg. 170/03   13-6   (4); SDWA   O. Reg. 170/03   13-6   (5); SDWA   O. Reg. 170/03   13-6   (6);		
<b>Observation</b>			
All trihalomethane water quality monitoring requirements prescribed by legislation were conducted within the required frequency and at the required location.			
Section 13-6 of Schedule 13, O.Reg.170/03 requires the Owner/OCWA (Operating Authority) to ensure that at least one distribution sample is taken every 3 months from a point in the drinking water system's distribution system, or in plumbing that is connected to the drinking water system, that is likely to have an elevated potential for the formation of Trihalomethanes (THMs), and tested for THMs. Section 6-1.1 of Schedule 6, O.Reg.170/03 requires that these samples be taken at least 60 days, and not more than 120 days, after a sample was taken for that purpose in the previous three month period. A drinking water quality standard of 100 micrograms per Litre (ug/L) for THMs is in effect under O.Reg. 169/03 "Ontario Drinking Water Quality Standards" (ODWQS) and it is expressed as a Running Annual Average (RAA), where the RAA is defined as the average for quarterly THM results for a drinking water system. Sampling for the inspection period occurred on April 4 (22.0 ug/L), July 5 (31.0 ug/L), October 3, 2022 (51.0 ug/L) and January 3, 2023 (31.0 ug/L). The inspection review period RAA concentration for THMs in the Wiarton DWS is 33.75 ug/L. The Ontario Drinking Water Quality Standard is a RAA concentration of 100 ug/L.			

<b>Question ID</b>	MRDW1094001	<b>Question Type</b>	Legislative
<b>Question:</b> Are all water quality monitoring requirements imposed by the MDWL and DWWP being			

met?	
<b>Legislative Requirement</b>	SDWA   31   (1);
<b>Observation</b>	
<p>All water quality monitoring requirements imposed by the MDWL or DWWP issued under Part V of the SDWA were being met.</p> <p>Wastewater from the backwash process for the chemically-assisted filtration system is discharged to a wastewater sedimentation tank where suspended solids are permitted to settle. MDWL Schedule C, Table 3 identifies that the annual average concentration of Backwash Wastewater Facility Suspended Solids discharged from the holding tank shall not exceed 25 mg/L and the annual average concentration of total chlorine residual shall not exceed 0.02 mg/L.</p> <p>Table 7 identifies that Backwash Wastewater Suspended Solids and total chlorine residual parameters shall be comprised of manual composite samples taken monthly at the point of discharge from the filter backwash tank. During the inspection review period this requirement was met. The annual average concentration of Backwash Wastewater Facility Suspended Solids discharged from the holding tank 7.41 mg/L and the annual average concentration of total chlorine residual was 0.00 mg/L.</p>	

<b>Question ID</b>	MRDW1113000	<b>Question Type</b>	Legislative
<b>Question:</b>			
Have all changes to the system registration information been provided to the Ministry within ten (10) days of the change?			
<b>Legislative Requirement</b>	SDWA   O. Reg. 170/03   10.1   (3);		
<b>Observation</b>			
All changes to the system registration information were provided within ten (10) days of the change.			

<b>Question ID</b>	MRDW1054001	<b>Question Type</b>	Information
<b>Question:</b>			
For stand alone connected distribution systems, if the receiving system is claiming the exemptions to O. Reg. 170/03 available under subsection 5(4), does the agreement with the donor satisfy the requirements prescribed by subsection 5(4)?			
<b>Legislative Requirement</b>	Not Applicable		
<b>Observation</b>			

The receiving system was claiming exemptions to O. Reg. 170/03 available under subsection 5(4), and the agreement with the donor satisfied the requirements prescribed by subsection 5(4).

On September 18, 2019 a Water Supply Agreement was adopted between The Corporation of The Town of South Bruce Peninsula (donor) and The Corporation of The Township of Georgian Bluffs (receiver) in Georgian Bluffs By-Law 2019-105 for the Oxenden Distribution System. The Water Supply Agreement replaces a previous expired agreement between The Town of Wiarton and The Township of Keppel (Keppel By-Law 455-97) dated April 14, 1997.

<b>Question ID</b>	MRDW1059000	<b>Question Type</b>	Legislative
<b>Question:</b>			
Do the operations and maintenance manuals contain plans, drawings and process descriptions sufficient for the safe and efficient operation of the system?			
<b>Legislative Requirement</b>	SDWA   O. Reg. 128/04   28;		
<b>Observation</b>			
The operations and maintenance manuals contained plans, drawings and process descriptions sufficient for the safe and efficient operation of the system.			

<b>Question ID</b>	MRDW1060000	<b>Question Type</b>	Legislative
<b>Question:</b>			
Do the operations and maintenance manuals meet the requirements of the DWWP and MDWL issued under Part V of the SDWA?			
<b>Legislative Requirement</b>	SDWA   31   (1);		
<b>Observation</b>			
The operations and maintenance manuals met the requirements of the Drinking Water Works Permit and Municipal Drinking Water Licence issued under Part V of the SDWA.			
Condition 16, Schedule B of the Licence prescribes that the operations and maintenance manual include at a minimum:			
<ul style="list-style-type: none"> <li>-the requirements of the licence and associated procedures;</li> <li>-the requirements of the drinking water works permit for the drinking water system;</li> <li>-a description of the processes used to achieve primary and secondary disinfection within the drinking water system, including where applicable a copy of the CT calculations that were used as the basis for primary disinfection under worst case operating conditions; -</li> <li>procedures for monitoring and recording the in-process parameters necessary for the control of any treatment subsystem and for assessing the performance of the drinking water</li> </ul>			

system;

- procedures for the operation and maintenance of monitoring equipment;
- contingency plans and procedures for the provision of adequate equipment and material to deal with emergencies, upset conditions and equipment breakdown; and,
- procedures for the dealing with complaints related to the drinking water system, including the recording of the nature of the complaint and any investigation and corrective action taken in respect of the complaint. Procedures necessary for the operation and maintenance of any alterations to the drinking water system must also be incorporated into the operations and maintenance manual prior to the alterations coming into operation. Operations and maintenance manuals are available to staff at the potable water plant. The Owner has also developed and maintains standardized SOPs for each of their drinking water systems, which are maintained and made fully available in an electronic format. The contents of the SOPs and manuals appear to be sufficient, enabling staff to safely operate the drinking water system. As it pertains to the CT provisions, operators are familiar with the operational criteria necessary to achieve primary disinfection.

Question ID	MRDW1061001	Question Type	Legislative
<b>Question:</b> Are logbooks properly maintained and contain the required information?			
Legislative Requirement	SDWA   O. Reg. 128/04   27   (1); SDWA   O. Reg. 128/04   27   (2); SDWA   O. Reg. 128/04   27   (3); SDWA   O. Reg. 128/04   27   (4); SDWA   O. Reg. 128/04   27   (5); SDWA   O. Reg. 128/04   27   (6); SDWA   O. Reg. 128/04   27   (7);		
<b>Observation</b>			
Logbooks were properly maintained and contained the required information.			

Question ID	MRDW1062001	Question Type	Legislative
<b>Question:</b> Do records or other record keeping mechanisms confirm that operational testing not performed by continuous monitoring equipment is being done by a certified operator, water quality analyst, or person who meets the requirements of O. Reg. 170/03 7-5?			
Legislative Requirement	SDWA   O. Reg. 170/03   7-5;		
<b>Observation</b>			
Records or other record keeping mechanisms confirmed that operational testing not performed by continuous monitoring equipment was being done by a certified operator, water quality analyst, or person who suffices the requirements of O. Reg. 170/03 7-5.			

<b>Question ID</b>	MRDW1071000	<b>Question Type</b>	BMP
<b>Question:</b> Has the owner provided security measures to protect components of the drinking water system?			
<b>Legislative Requirement</b>	Not Applicable		
<b>Observation</b>			
The owner had provided security measures to protect components of the drinking water system.			
The Warton water treatment plant has lockable doors and is equipped with an intruder alarm and signage restricting access to the site. The Warton Booster station and standpipe have perimeter fencing with a lockable gate restricting access to the site. At the time of inspection there were no reported issues of unauthorized access, vandalism and/or cyber security issues impacting the DWS during the inspection time period.			

<b>Question ID</b>	MRDW1073001	<b>Question Type</b>	Legislative
<b>Question:</b> Has the overall responsible operator been designated for all subsystems which comprise the drinking water system?			
<b>Legislative Requirement</b>	SDWA   O. Reg. 128/04   23   (1);		
<b>Observation</b>			
The overall responsible operator had been designated for each subsystem.			
The ORO for the Warton DWS is James Learn, with back-up being provided by Andrew Belamy.			

<b>Question ID</b>	MRDW1074001	<b>Question Type</b>	Legislative
<b>Question:</b> Have operators-in-charge been designated for all subsystems for which comprise the drinking water system?			
<b>Legislative Requirement</b>	SDWA   O. Reg. 128/04   25   (1);		
<b>Observation</b>			
Operators-in-charge had been designated for all subsystems which comprise the drinking			



water system.

<b>Question ID</b>	MRDW1075001	<b>Question Type</b>	Legislative
<b>Question:</b> Do all operators possess the required certification?			
<b>Legislative Requirement</b>	SDWA   O. Reg. 128/04   22;		
<b>Observation</b>			
All operators possessed the required certification.			

<b>Question ID</b>	MRDW1076001	<b>Question Type</b>	Legislative
<b>Question:</b> Do only certified operators make adjustments to the treatment equipment?			
<b>Legislative Requirement</b>	SDWA   O. Reg. 170/03   1-2   (2);		
<b>Observation</b>			
Only certified operators made adjustments to the treatment equipment.			

<b>Question ID</b>	MRDW1115001	<b>Question Type</b>	Legislative
<b>Question:</b> Were the inspection questions sufficient to address other non-compliance items identified during the inspection period?			
<b>Legislative Requirement</b>	Not Applicable		
<b>Observation</b>			
The following instance(s) of non-compliance were also noted during the inspection:  As identified previously in this report, the construction of new watermains, including the transfer of water service connections, occurred on Mary Street from Claude Street to Brown Street and on Mary Street from Brown Street to Issac Street during the inspection review time period, as documented in the Form 1 submitted by OCWA.  Disinfection records for the above new watermain works were provided for review by OCWA and GM Blue Plan Engineering, who were retained by the Owner to commission the works, which identified that all parts of the drinking water system that came in contact with drinking water were disinfected in accordance with the ANSI/AWWA C651-14 and the MECP 2020 Watermain Disinfection Procedure (WDP). Section 3.1 of the 2020 WDP			

identifies minimum recordkeeping requirements for new watermains. The information shall be retained as per the record-keeping requirements of Section 27 of O. Reg. 128/04.

Based upon an MECP review of the initially submitted documents, there was apparent missing recordkeeping information for the above works as required under the 2020 MECP WDP. The missing information was subsequently provided by GM Blue Plan Engineering, with exception of a schematic or drawing showing approximate location where Microbiological Samples were taken. OCWA has subsequently confirmed that an SOP entitled Watermain Commissioning was issued on 2021-02-01 which contains forms that would sufficiently document the above missing information.

To ensure that minimum documentation requirements required under the 2020 WDP are met in the future, the Owner/OCWA are required to develop a procedure, a copy of which is to be provided to the aforementioned Provincial Officer on or before March 17, 2023, whereby contractors and consultants retained by the Owner to undertake disinfection works on behalf of the Owner/OCWA, are made aware of the SOP and 2020 WDP in advance of undertaking watermain disinfection works thereby ensure that documentation of disinfection works are completed as required under the 2020 WDP.

<b>Question ID</b>	MRDW1009001	<b>Question Type</b>	Legislative
<b>Question:</b>			
Are measures in place to protect the groundwater and/or GUDI source in accordance with any MDWL and DWWP issued under Part V of the SDWA?			
<b>Legislative Requirement</b>	SDWA   31   (1);		
<b>Observation</b>			
Measures were in place to protect the groundwater and/or GUDI source in accordance with the Municipal Drinking Water Licence and Drinking Water Works Permit issued under Part V of the SDWA.			

<b>Question ID</b>	MRDW1011001	<b>Question Type</b>	BMP
<b>Question:</b>			
Does the owner have a harmful algal bloom monitoring plan in place?			
<b>Legislative Requirement</b>	Not Applicable		
<b>Observation</b>			
The owner had a harmful algal bloom monitoring plan in place.			
Condition 6.0, Schedule C of the MDWL requires the Owner to develop a Harmful Algal (Cyanobacteria) Bloom monitoring, reporting and sampling plan on or before November 16,			

2020. A Harmful Algal Bloom Monitoring, Reporting And Sampling Plan Standard Operating Procedure was implemented on 2013-07-02 and was subsequently revised on 2020-11-16, 2020-12-18 and 2020-12-22 to meet the above-referenced Licence.

<b>Question ID</b>	MRDW1012001	<b>Question Type</b>	Legislative
<b>Question:</b>			
Does the owner have a harmful algal bloom monitoring plan in place that meets the requirements of the MDWL?			
<b>Legislative Requirement</b>	SDWA   31   (1);		
<b>Observation</b>			
The owner had a harmful algal bloom monitoring plan in place.			

<b>Question ID</b>	MRDW1014001	<b>Question Type</b>	Legislative
<b>Question:</b>			
Is there sufficient monitoring of flow as required by the MDWL or DWWP issued under Part V of the SDWA?			
<b>Legislative Requirement</b>	SDWA   31   (1);		
<b>Observation</b>			
There was sufficient monitoring of flow as required by the Municipal Drinking Water Licence or Drinking Water Works Permit issued under Part V of the SDWA.			
The Warton DWS has the following control documents in place associated with maximum flow rate or the rated capacity conditions:			
Municipal Drinking Water Licence Number: 094-102 Issue Number: 4 issued March 6, 2020 with a rated capacity of 5,400 m <sup>3</sup> /d;			
Drinking Water Works Permit 094-202 Issue Number: 4 issued March 6, 2020;			
Permit to Take Water (PTTW) 5181-9DFR4C with a drinking water source from Colpoy's Bay, expiring November 14, 2023, with a maximum water taking of 5394 cubic metres/day (3764 Litres/minute). It's noted the owner can increase the maximum water taking to 4500 L/m for not greater than one hour for pump start up circumstances. The document holder shall document any readings greater than 3764 Litres/minute and the rationale for each exceedance.			
MDWL Schedule C Section 3.0 identifies that all flow meters that are required by regulation, by a condition in the drinking water works permit #094-202, or by a condition otherwise imposed by the Ministry, shall be checked and where necessary calibrated in accordance with the manufacturer's instructions. If the manufacturer's instructions do not indicate how			

often to check and calibrate a flow measuring device, the equipment shall be checked and where necessary calibrated at least once every 12 months during which the DWS is in operation, and not more than 30 days after the first anniversary of the day the equipment was checked and calibrated in the previous 12-month period. The Warton DWS flow meters were checked/verified, and where necessary calibrated, by IndusControl on June 14, 2022, and within 30 days of the 12-month period of the previous checks which occurred on June 8, 2021.

<b>Question ID</b>	MRDW1016001	<b>Question Type</b>	Legislative
<b>Question:</b>			
Is the owner in compliance with the conditions associated with maximum flow rate or the rated capacity conditions in the MDWL issued under Part V of the SDWA?			
<b>Legislative Requirement</b>	SDWA   31   (1);		
<b>Observation</b>			
The owner was in compliance with the conditions associated with maximum flow rate or the rated capacity conditions in the Municipal Drinking Water Licence issued under Part V of the SDWA.			
Table 1 in Schedule C of the MDWL identifies the maximum daily volume of treated water that flows from the treatment subsystem to the distribution system shall not exceed 5400 m <sup>3</sup> /day. The maximum daily volume of treated water flow that occurred during the inspection time period was 1792.56 m <sup>3</sup> on September 17, 2022, representing approximately 33% of the rated capacity.			

<b>Question ID</b>	MRDW1023001	<b>Question Type</b>	Legislative
<b>Question:</b>			
Do records indicate that the treatment equipment was operated in a manner that achieved the design capabilities required under Ontario Regulation 170/03 or a DWWP and/or MDWL issued under Part V of the SDWA at all times that water was being supplied to consumers?			
<b>Legislative Requirement</b>	SDWA   O. Reg. 170/03   1-2   (2);		
<b>Observation</b>			
Records indicated that the treatment equipment was operated in a manner that achieved the design capabilities required under O. Reg. 170/03 or a Drinking Water Works Permit and/or Municipal Drinking Water Licence issued under Part V of the SDWA at all times that water was being supplied to consumers.			
Treatment for a surface water source is required to achieve 2-log removal or inactivation of			

Cryptosporidium oocysts, a 3-log removal or inactivation of Giardia cysts and a 4-log removal or inactivation of viruses. These requirements are reportedly met by coagulation, clarification and filtration followed by UV disinfection and chlorination with sodium hypochlorite for both primary and secondary disinfection purposes. According to Schedule E of the MDWL, the direct filtration process is credited with 2 log Giardia cyst removal, 2 log Cryptosporidium oocyst removal and 1 log virus removal credits, if the filtration process meets the following criteria:

- a chemical coagulant is used at all times when the treatment plant is in operation;
- chemical dosages are monitored and adjusted in response to variations in raw water quality;
- effective backwash procedures are maintained, including filter-to-waste or an equivalent procedure during filter ripening to ensure that the effluent turbidity requirements are met at all times;
- filtrate turbidity is continuously monitored from each filter; and, -the performance criterion for filtered water turbidity of less than or equal to 0.3 NTU in 95% of the measurements each month are met for each filter. The UV disinfection process is credited with 3 log Giardia cyst removal, 2 log Cryptosporidium oocyst removal and 2 log virus removal credits, if the UV disinfection process meets Licence Schedule E UV treatment criteria. The Chlorination process is credited with 1+ log virus removal credits if the chlorination process meets MDWL Schedule E chlorination treatment criteria.

Records reviewed indicate that the Warton Water Treatment Plant was operated to achieve the necessary UV criteria, CT requirements and filter performance criteria for primary disinfection purposes during the inspection cycle.

<b>Question ID</b>	MRDW1026001	<b>Question Type</b>	Legislative
<b>Question:</b>			
If primary disinfection equipment that does not use chlorination or chloramination is provided, is the equipment equipped with alarms or shut-off mechanisms that satisfy the standards described in Section 1-6 (1) of Schedule 1 of Ontario Regulation 170/03?			
<b>Legislative Requirement</b>	SDWA   O. Reg. 170/03   1-6   (1);		
<b>Observation</b>			
The primary disinfection equipment was equipped with alarms or shut-off mechanisms that satisfied the standards described in Section 1-6 (1) of Schedule 1 of O. Reg. 170/03.			
Schedule E of the MDWL identifies that the UV disinfection system is credited with primary disinfection pathogen log removal/inactivation credits of 2 for Cryptosporidium Oocysts, 3 for Giardia Cysts and 2 for Viruses, provided that the treatment process is fully operational and log removal/inactivation credit assignment criteria is being met. Schedule C of the MDWL further identifies that the UV disinfection equipment at the Warton WTP shall maintain a minimum continuous pass-through UV dose of 40 mJ/cm <sup>2</sup> . To ensure that the			

above-referenced Schedule requirements are met, and that the UV disinfection system satisfies the standards described in Section 1-6 (1) of Schedule 1 of Ontario Regulation 170/03, a SCADA alarm set point of 40.0 mJ/cm<sup>2</sup>, if triggered, shuts down the DWS high lift pumps ceasing water production and notifies operators to attend the site.

<b>Question ID</b>	MRDW1030000	<b>Question Type</b>	Legislative
<b>Question:</b>			
Is primary disinfection chlorine monitoring being conducted at a location approved by MDWL and/or DWWP issued under Part V of the SDWA, or at/near a location where the intended CT has just been achieved?			
<b>Legislative Requirement</b>	SDWA   O. Reg. 170/03   7-2   (1); SDWA   O. Reg. 170/03   7-2   (2);		
<b>Observation</b>			
Primary disinfection chlorine monitoring was conducted at a location approved by Municipal Drinking Water Licence and/or Drinking Water Works Permit issued under Part V of the SDWA, or at/near a location where the intended CT has just been achieved.			

<b>Question ID</b>	MRDW1032001	<b>Question Type</b>	Legislative
<b>Question:</b>			
If the drinking water system obtains water from a surface water source and provides filtration, is continuous monitoring of each filter effluent line being performed for turbidity?			
<b>Legislative Requirement</b>	SDWA   O. Reg. 170/03   7-3   (2);		
<b>Observation</b>			
Continuous monitoring of each filter effluent line was being performed for turbidity.			
For large municipal residential systems that use surface water or GUDI as the source and are required to provide filtration, Reg.170/03, Schedule 7 section 7(3)(2) requires continuous monitoring equipment of each filter effluent line. Continuous monitoring for turbidity is required only for the filter effluent that is directed to the next treatment process/stage (and eventually to the distribution system). Gaps in data should correlate to times when the plant was not treating water, or for maintenance of the analyzer; this is being met. The filter train alarms are present to help ensure compliance with the Procedure for Disinfection of Drinking Water in Ontario effluent turbidity requirements of being less than or equal to 0.30 NTU in 95% of the measurements recorded each month on each filter effluent line.			

<b>Question ID</b>	MRDW1039000	<b>Question Type</b>	Legislative
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<b>Question:</b> If primary disinfection equipment that does not use chlorination or chloramination is provided, has the owner and operating authority ensured that the equipment has a recording device that continuously records the performance of the disinfection equipment?	
<b>Legislative Requirement</b>	SDWA   O. Reg. 170/03   1-6   (3);
<b>Observation</b>	
The owner and operating authority ensured that the primary disinfection equipment had a recording device that continuously recorded the performance of the disinfection equipment.	

<b>Question ID</b>	MRDW1109001	<b>Question Type</b>	Legislative
<b>Question:</b> If the system uses equipment for primary disinfection other than chlorination or chloramination and the equipment has malfunctioned, lost power or ceased to provide the appropriate level of disinfection, causing an alarm or an automatic shut-off, did a qualified person respond in a timely manner and take appropriate actions?			
<b>Legislative Requirement</b>	SDWA   O. Reg. 170/03   1-6   (1);		
<b>Observation</b>			
When failure(s) of primary disinfection equipment, other than that used for chlorination or chloramination, caused an alarm to sound or an automatic shut-off to occur, a certified operator responded in a timely manner and took appropriate actions.			

<b>Question ID</b>	MRDW1042001	<b>Question Type</b>	Legislative
<b>Question:</b> If UV disinfection is used were duty sensors and reference UV sensors checked and calibrated as per the requirements of Schedule E of the MDWL or at a frequency as otherwise recommended by the UV equipment manufacturer?			
<b>Legislative Requirement</b>	SDWA   31   (1);		
<b>Observation</b>			
All UV sensors were checked and calibrated as required.			
Records provided by OCWA identify that duty UV sensors were checked monthly against a reference UV sensor, with the calibration ratio (intensity measured with the duty sensor/intensity measured with the reference UV sensor) documented to be less than or equal to 1.2, in compliance with Schedule E of the MDWL. Reference UV sensors shall be checked against a Master Reference Assembly at a minimum frequency of once every three years or on a more frequent basis depending upon the recommendations of the			

equipment manufacturer.

<b>Question ID</b>	MRDW1083001	<b>Question Type</b>	Legislative
<b>Question:</b> For LMR systems, are all microbiological water quality monitoring requirements for treated samples being met?			
<b>Legislative Requirement</b>	SDWA   O. Reg. 170/03   10-3;		
<b>Observation</b>			
All microbiological water quality monitoring requirements prescribed by legislation for treated samples were being met. Section 10-3 of Schedule 10, O.Reg.170/03 requires the Owner to ensure samples are collected at least once every week from the system's treated water at the point of entry into the distribution system. The samples collected are required to be tested for E.Coli and total coliform, and general bacteria populations expressed as colony counts on a heterotrophic plate count. Records reviewed in the course of this inspection indicate that the Owner complied with these requirements. There were no concerns identified with the results obtained.			

<b>Question ID</b>	MRDW1084001	<b>Question Type</b>	Legislative
<b>Question:</b> Are all inorganic water quality monitoring requirements prescribed by legislation conducted within the required frequency?			
<b>Legislative Requirement</b>	SDWA   O. Reg. 170/03   13-2;		
<b>Observation</b>			
All inorganic water quality monitoring requirements prescribed by legislation were conducted within the required frequency.			
Sampling and testing for inorganic parameters has been conducted for the Warton DWS in accordance with Schedule 13-2 of Ontario Regulation 170/03. The regulation requires that samples are to be collected every 12 months and tested for each parameter listed in Schedule 23; this requirement has been met. The OA provided results for samples collected on January 4, 2022 (pre-dating the inspection review time period) and for samples collected on January 3, 2023. There were no concerns identified from the results obtained.			

<b>Question ID</b>	MRDW1088000	<b>Question Type</b>	Legislative
<b>Question:</b> Are all nitrate/nitrite water quality monitoring requirements prescribed by legislation			



conducted within the required frequency for the DWS?	
<b>Legislative Requirement</b>	SDWA   O. Reg. 170/03   13-7;
<b>Observation</b>	
<p>All nitrate/nitrite water quality monitoring requirements prescribed by legislation were conducted within the required frequency for the DWS.</p> <p>Section 13-7 of Schedule 13, O.Reg.170/03 requires the Owner/OCWA to ensure that at least one water sample is taken every three months and tested for nitrates and nitrites. Section 6-1.1 of Schedule 6, O.Reg.170/03 requires that these samples be taken at least 60 days, and not more than 120 days, after a sample was taken for that purpose in the previous three month period. The Owner complied with these requirements when they conducted the required monitoring on April 4, July 5, October 3, 2022 and January ,3, 2023. There were no concerns identified with the sample results obtained.</p>	

<b>Question ID</b>	MRDW1089000	<b>Question Type</b>	Legislative
<b>Question:</b>			
Are all sodium water quality monitoring requirements prescribed by legislation conducted within the required frequency?			
<b>Legislative Requirement</b>	SDWA   O. Reg. 170/03   13-8;		
<b>Observation</b>			
<p>All sodium water quality monitoring requirements prescribed by legislation were conducted within the required frequency.</p> <p>Section 13-8 of Schedule 13, O.Reg.170/03 requires that the Owner/OCWA to ensure that a water sample is taken every 60 months and tested for sodium. Records provided by the Owner indicate that OCWA conducted sampling for sodium on January 3, 2023 and achieved a result of 6.70 mg\L. The next sodium sample results are due in January 2028.</p>			

<b>Question ID</b>	MRDW1090000	<b>Question Type</b>	Legislative
<b>Question:</b>			
Where fluoridation is not practiced, are all fluoride water quality monitoring requirements prescribed by legislation conducted within the required frequency?			
<b>Legislative Requirement</b>	SDWA   O. Reg. 170/03   13-9;		
<b>Observation</b>			
All fluoride water quality monitoring requirements prescribed by legislation were conducted within the required frequency.			

Section 13-9 of Schedule 13, O.Reg.170/03 requires the Owner/OCWA to ensure that at least one water sample is taken every 60 months and tested for fluoride. Records provided by the Owner indicate that OCWA conducted sampling for fluoride on January 3, 2023 and achieved a result of 0.06 mg/L, below the Ontario Regulation 169/03 Ontario Drinking Water Quality Standard of 1.5 mg/L for fluoride. The next fluoride sample results are due in January 2028.

<b>Question ID</b>	MRDW1085001	<b>Question Type</b>	Legislative
<b>Question:</b>			
Are all organic water quality monitoring requirements prescribed by legislation conducted within the required frequency?			
<b>Legislative Requirement</b>	SDWA   O. Reg. 170/03   13-4   (1); SDWA   O. Reg. 170/03   13-4   (2); SDWA   O. Reg. 170/03   13-4   (3);		
<b>Observation</b>			
All organic water quality monitoring requirements prescribed by legislation were conducted within the required frequency.			
Sampling and testing for organic parameters has been conducted for the Warton DWS in accordance with Schedule 13-4 of Ontario Regulation 170/03. The regulation requires that samples are to be collected every 12 months and tested for each parameter listed in Schedule 24; this requirement has been met. The OA provided results for samples collected on January 4, 2022 (pre-dating the inspection review time period) and for samples collected on January 3, 2023. There were no concerns identified from the results obtained.			

Ministry of the Environment, Conservation and Parks - Inspection Summary Rating Record (Reporting Year - 2022-2023)

**DWS Name:** WIARTON DRINKING WATER SYSTEM  
**DWS Number:** 220002681  
**DWS Owner:** THE CORPORATION OF THE TOWN OF SOUTH BRUCE PENINSULA  
**Municipal Location:** SOUTH BRUCE PENINSULA

**Regulation:** O.REG. 170/03  
**DWS Category:** DW Municipal Residential  
**Type of Inspection:** Focused  
**Inspection Date:** Jan-10-2023  
**Ministry Office:** Owen Sound District Office

**Maximum Risk Rating:** 529

Inspection Module	Non Compliance Rating
Treatment Processes	0 / 39
Operations Manuals	0 / 28
Water Quality Monitoring	0 / 24
Reporting & Corrective Actions	0 / 4
Other Inspection Findings	0 / 434
<b>Overall - Calculated</b>	<b>0 / 529</b>

**Inspection Risk Rating:** 0.00%

**Final Inspection Rating:** 100.00%

Ministry of the Environment, Conservation and Parks - Detailed Inspection Rating Record (Reporting Year - 2022-2023)

**DWS Name:** WIARTON DRINKING WATER SYSTEM  
**DWS Number:** 220002681  
**DWS Owner Name:** THE CORPORATION OF THE TOWN OF SOUTH BRUCE PENINSULA  
**Municipal Location:** SOUTH BRUCE PENINSULA

**Regulation:** O.REG. 170/03  
**DWS Category:** DW Municipal Residential  
**Type of Inspection:** Focused  
**Inspection Date:** Jan-10-2023  
**Ministry Office:** Owen Sound District Office

Non-Compliant Question(s)	Question Rating
<b>Other Inspection Findings</b>	
Were the inspection questions sufficient to address other non-compliance items identified during the inspection period?	0
<b>Overall - Total</b>	<b>0</b>

Maximum Question Rating: 529

**Inspection Risk Rating: 0.00%**

**FINAL INSPECTION RATING: 100.00%**



**Ministry of the Environment, Conservation and Parks  
Drinking Water Inspection Report**

**APPENDIX B**

**REFERENCE GUIDE FOR STAKEHOLDERS**

# Key Reference and Guidance Material for Municipal Residential Drinking Water Systems

Many useful materials are available to help you operate your drinking water system. Below is a list of key materials owners and operators of municipal residential drinking water systems frequently use.

To access these materials online click on their titles in the table below or use your web browser to search for their titles. Contact the Ministry if you need assistance or have questions at 1-866-793-2588 or [waterforms@ontario.ca](mailto:waterforms@ontario.ca).

For more information on Ontario's drinking water visit [www.ontario.ca/drinkingwater](http://www.ontario.ca/drinkingwater)



PUBLICATION TITLE	PUBLICATION NUMBER
<b>FORMS:</b> Drinking Water System Profile Information Laboratory Services Notification Adverse Test Result Notification	012-2149E 012-2148E 012-4444E
Taking Care of Your Drinking Water: A Guide for Members of Municipal Councils	Website
Procedure for Disinfection of Drinking Water in Ontario	Website
Strategies for Minimizing the Disinfection Products Trihalomethanes and Haloacetic Acids	Website
Filtration Processes Technical Bulletin	Website
Ultraviolet Disinfection Technical Bulletin	Website
Guide for Applying for Drinking Water Works Permit Amendments, & License Amendments	Website
Certification Guide for Operators and Water Quality Analysts	Website
Guide to Drinking Water Operator Training Requirements	9802E
Community Sampling and Testing for Lead: Standard and Reduced Sampling and Eligibility for Exemption	Website
Drinking Water System Contact List	7128E01
Ontario's Drinking Water Quality Management Standard - Pocket Guide	Website
Watermain Disinfection Procedure	Website
List of Licensed Laboratories	Website

# Principaux guides et documents de référence sur les réseaux résidentiels municipaux d'eau potable

De nombreux documents utiles peuvent vous aider à exploiter votre réseau d'eau potable. Vous trouverez ci-après une liste de documents que les propriétaires et exploitants de réseaux résidentiels municipaux d'eau potable utilisent fréquemment. Pour accéder à ces documents en ligne, cliquez sur leur titre dans le tableau ci-dessous ou faites une recherche à l'aide de votre navigateur Web. Communiquez avec le ministère au 1-866-793-2588, ou encore à [waterforms@ontario.ca](mailto:waterforms@ontario.ca) si vous avez des questions ou besoin d'aide.



Pour plus de renseignements sur l'eau potable en Ontario, consultez le site [www.ontario.ca/eaupotable](http://www.ontario.ca/eaupotable)

TITRE DE LA PUBLICATION	NUMÉRO DE PUBLICATION
Renseignements sur le profil du réseau d'eau potable	012-2149F
Avis de demande de services de laboratoire	012-2148F
Avis de résultats d'analyse insatisfaisants et de règlement des problèmes	012-4444F
Prendre soin de votre eau potable - Un guide destiné aux membres des conseils municipaux	Site Web
Marche à suivre pour désinfecter l'eau potable en Ontario	Site Web
Stratégies pour minimiser les trihalométhanes et les acides haloacétiques de sous-produits de désinfection	Site Web
Filtration Processes Technical Bulletin (en anglais seulement)	Site Web
Ultraviolet Disinfection Technical Bulletin (en anglais seulement)	Site Web
Guide de présentation d'une demande de modification du permis d'aménagement de station de production d'eau potable	Site Web
Guide sur l'accréditation des exploitants de réseaux d'eau potable et des analystes de la qualité de l'eau de réseaux d'eau potable	Site Web
Guide sur les exigences relatives à la formation des exploitants de réseaux d'eau potable	9802F
Échantillonnage et analyse du plomb dans les collectivités : échantillonnage normalisé ou réduit et admissibilité à l'exemption	Site Web
Liste des personnes-ressources du réseau d'eau potable	Site Web
L'eau potable en Ontario - Norme de gestion de la qualité - Guide de poche	Site Web
Procédure de désinfection des conduites principales	Site Web
Laboratoires autorisés	Site Web

# Watermain Disinfection Procedure

## August 1, 2020

Ministry of the Environment, Conservation and Parks  
Environmental Assessment and Permissions Division



## VERSION HISTORY

Version	Details	Date
1.0	Initial publication of the 2015 Watermain Disinfection Procedure	November 2015
2.0	Initial publication of the revised 2020 Watermain Disinfection Procedure	August 1, 2020
2.1	Appendix F (pg. 24) – administrative correction to Public Agency Notification Requirements in the Category 2 Flowchart. Corrected wording: “Speak to a Ministry person as soon as reasonable possible by speaking to someone at the Ministry’s Spills Action Centre” (s.2.3.1.2)	December 9, 2020

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## Preface

This watermain disinfection procedure is a supporting document for Ontario legislation and regulations related to *Drinking Water*. Schedule B, Condition 2.3 of the Drinking Water Works Permit adopts this procedure by reference. Where this procedure makes reference to ANSI/AWWA Standard C651 “Disinfecting Water Mains” and “CSA Standards B64.10 and B64.10.1”, the most current versions of these standards shall be used. The section numbers mentioned in this document are based on the 2014 version of C651 and the March 2017 version of B64.10 and B64.10.1. When updated versions of these standards are released however, the corresponding section(s) and amended wording of the updated versions will supersede the requirements of the previous version. Definitions listed in Appendix H are capitalized and italicized throughout this procedure.

The requirements in this procedure apply to all watermains of any size, including temporary watermains. *Service Pipes* of 100 mm diameter and greater shall be considered as watermains for the purposes of this procedure.

Operating Authorities shall use *Certified Operators* for activities that must be performed by a *Certified Operator* or may use a *Water Quality Analyst* for sampling and testing if permitted through regulation. Watermains that form part of a *Drinking Water System* can only be *Isolated* and placed into service by *Certified Operators*. Activities performed on *Isolated* watermains are not required to be performed by *Certified Operators*.

Any water used for the purposes of, but not limited to, flushing, swabbing, disinfection, hydrostatic testing, and displacing water to obtain samples for testing, shall be *Drinking Water*. Any temporary water supply to a new watermain shall be *Flushed* prior to its use as a water source.

Chemicals used for disinfection shall meet the requirements of both the American Water Works Association (“AWWA”) and the American National Standards Institute (“ANSI”) safety criteria standards NSF/ANSI/CAN 60.

Operating Authorities may use best management practices that exceed the minimum requirements in this procedure.

Deviations from this procedure may be requested from the ministry’s Approval and Licensing office on a case-by-case basis.

# 1. Addition, Modification, Replacement, Extension and Planned Maintenance

## 1.1. New Watermains

For watermains, including temporary watermains, that are added to, modified, re-aligned, replaced or extended within a *Drinking Water System*, Operating Authorities shall ensure that the requirements of ANSI/AWWA Standard C651 are followed as modified by this procedure.

### 1.1.1. Backflow Prevention Requirements for New Watermains

The *Backflow Prevention* provisions within Section 4.8.9 of ANSI/AWWA Standard C651 shall be mandatory for the installation of new watermains except for *Connections* (see section 1.1.4).

Where required, *Backflow Prevention* for new watermains shall be accomplished by:

- an air gap as defined in CSA Standard B64.10 “Selection and Installation of Backflow Preventers”; or
- A CSA-certified reduced pressure principle (RP) backflow preventer that has been selected and field tested in accordance with CSA Standards B64.10 and B64.10.1. Examples of RP backflow preventer installations are shown in Figures A-1 and A-2, while schematic representations are shown in Figures A-3 and A-4, respectively, of Appendix A.

**Exception:** If a backflow preventer is relocated within the same day, testing is only required for the first installation of the day provided that the backflow preventer is relocated by a *Certified Operator* who will guard against damage during transit and re-installation.

For the purposes of CSA Standard B64.10, a backflow prevention tester’s licence shall be an Ontario Water Works Association (OWWA) Certified Cross Connection Control Specialist Certificate or a *Ministry*-approved equivalent. In addition to the list of professionals in Table 1 of Figure E.1. of CSA Standard B64.10, a *Certified Operator* or a *Water Quality Analyst* with a backflow prevention tester’s licence shall also be

authorized to test, install, relocate, repair or replace backflow preventers used in the installation and commissioning of new watermains.

### **1.1.2. Disinfection of New Watermains**

For preliminary flushing prior to disinfection referred to in Sections 4.4.2 and 4.5.2 of ANSI/AWWA Standard C651, if the requirements of ANSI/AWWA Standard C651 for a velocity of 3.0 ft/sec (0.91 m/sec) are not practical, alternative cleaning consisting of swabbing or flushing 2-3 pipe volumes can be used at the discretion of the Operating Authority.

Where a newly constructed watermain is disinfected using the tablet, continuous feed, slug, or spray chlorination method (not limited to large transmission mains) as per the procedures in ANSI/AWWA Standard C651, the minimum contact times, initial chlorine concentrations, and maximum allowable decreases in chlorine concentration as listed in Table 1 shall be used. The disinfection method used is at the discretion of the Operating Authority.

When using the Tablet or Continuous Feed Disinfection Method, if the Maximum Allowable Decrease in Chlorine Concentrations is exceeded at any of the sampling points, the disinfection procedure must be repeated.

When using the Slug Disinfection Method, the chlorine concentration shall be measured in the slug at the beginning of the disinfection process, as the slug moves through the watermain, and at the point of discharge. If the chlorine concentration decreases by more than 25 mg/L at any of the sampling points, the flow shall be stopped and additional chlorine shall be added to restore the chlorine concentration in the slug to not less than its original concentration.

**Table 1: Chlorine Concentrations\* and Contact Times for Disinfecting New Watermains**

Disinfection Method	Minimum Contact Time	Initial Chlorine Concentration	Maximum Allowable Decrease in Chlorine Concentration
Tablet or Continuous Feed	24 hours	≥ 25 mg/L	40% of the Initial Chlorine Concentration to a maximum of 50 mg/L**
Slug	3 hours	≥ 100 mg/L	25 mg/L
Spray	30 minutes	≥ 200 mg/L	Measurement Not Required

\* At concentrations over 10 mg/L, measurements of total chlorine and free chlorine shall be deemed equivalent.

\*\* **Exception:** Where copper pipe is used as a watermain, disinfection shall be performed using the continuous feed method, with an initial chlorine concentration of ≥ 50 mg/L and a minimum 24-hour contact time. Due to the chlorine demand exerted by the copper, the maximum allowable decrease requirement in Table 1 does not apply, and the effectiveness of the disinfection process shall be demonstrated by the Microbiological Sampling referred to in Section 1.1.3.

The following examples are provided to demonstrate the proper use of Table 1.

**Example 1**

When using the Continuous Feed Disinfection Method with an initial chlorine concentration of 50 mg/L, the maximum allowable decrease in chlorine concentration is 40% of 50 mg/L, or 20 mg/L. Therefore, at least 30 mg/L of chlorine must be present after 24 hours.

**Example 2**

When using the Continuous Feed Disinfection Method with an initial chlorine concentration of 150 mg/L, the maximum allowable decrease in chlorine concentration

is 50 mg/L, because 40% of 150 mg/L is greater than the maximum allowable decrease of 50 mg/L. Therefore, at least 100 mg/L of chlorine must be present after 24 hours.

### **Example 3**

When using the Slug Disinfection Method, if the initial chlorine concentration in the slug is 150 mg/L, then the chlorine concentration must not decrease below 125 mg/L (a decrease of > 25 mg/L). If the chlorine concentration were to fall below 125 mg/L, the flow shall be stopped and chlorine added to restore the chlorine concentration to at least 150 mg/L.

#### **1.1.3. Microbiological Samples for New Watermains**

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.

For new watermains with limited sampling points available, an alternative method of taking *Microbiological Samples* is called staged sampling. Staged sampling shall be performed as follows:

- A flow meter shall be installed to measure flow through the new watermain;
- A sampling point shall be installed at the end of the new watermain (additional sampling points may also be installed along the length of the watermain); and



- Flow shall be established, and samples shall be taken from the sampling point(s) at intervals that are calculated to represent the lengths of the watermain as required by Sections 5.1.1.2 and 5.1.1.3 of ANSI/AWWA Standard C651, based on the pipe size and the measured flow rate.

Operating Authorities shall endeavour to maintain an *Acceptable Disinfectant Concentration* until the new watermain is placed into service. If 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) is not maintained prior to placing into service, the microbiological sampling shall be repeated.

#### **1.1.4. Connecting New Watermains to the Existing System**

The provisions outlined in Section 4.10 of ANSI/AWWA Standard C651 are mandatory, along with the additional requirements prescribed below. The *Backflow Prevention* provisions within Section 4.8.9 of ANSI/AWWA Standard C651 are not mandatory for *Connections*.

When *Microbiological Samples* are taken from *Connections*, 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.

##### **1.1.4.1. Connections Equal to or Less than One Pipe Length (Generally $\leq 6$ m)**

The Operating Authority shall ensure that *Connections* equal to or less than one pipe length (generally  $\leq 6$  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)**

*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.

#### **Procedure:**

- The new watermain and *Appurtenances* forming the *Connection* shall be sprayed or hand swabbed with a minimum 1% sodium hypochlorite solution, aboveground or in the excavation, immediately prior to installation.
- A *Certified Operator* is required to witness the installation of the *Connection* to ensure that sanitary construction practices are followed, and proper disinfection is performed.
- The *Connection* shall remain *Isolated* from the existing *Drinking Water System*, except while being flushed or sampled, until satisfactory results are received from two *Microbiological Samples* taken by a *Certified Operator* or a *Water Quality Analyst* in accordance with Section 5.1.1.1 of ANSI/AWWA Standard C651.
- Where required by the Operating Authority, hydrostatic testing of the *Connection* shall not be undertaken against the isolating valve until satisfactory

results from the *Microbiological Samples* referred to above are received. *Drinking Water* shall be used for hydrostatic testing.

Figure B-1 in Appendix B provides an example to help understand this exception.

#### **1.1.4.3. Placing New Watermains into Service**

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.

### **1.2. Relining of Watermains**

For relining of existing watermains, the conditions of Sections 1.1.2, 1.1.3 and 1.1.4 of this procedure will apply.

**Exception:** The Operating Authority may allow return to service prior to receiving all satisfactory *Microbiological Sample* results if all the following conditions are met:

- The watermain is physically *Isolated* from the remainder of the *Drinking Water System* through *Backflow Prevention*;
- The local Medical Officer of Health is consulted prior to the commencement of the project and their advice is documented and followed; and
- *Flushing* of the watermain has been completed and an *Acceptable Disinfectant Concentration* has been restored.

### **1.3. Planned Watermain Inspection and Cleaning**

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.

For planned watermain cleaning by swabbing or *Higher Velocity Flushing*, the system can be returned to normal service, defined as having all valves returned to normal operating position, after an *Acceptable Disinfectant Concentration* is achieved at the point of flushing.

For all other types of cleaning (e.g., air scouring, ice pigging, etc.), the Operating Authority shall develop and implement a site-specific plan for cleaning, disinfection, and sampling in agreement with the local *Ministry* office in consultation with the local Medical Officer of Health.

#### **1.4. Planned Maintenance of *Appurtenances* and Fittings**

Section 2 of this procedure for Category 1 watermain breaks shall apply to the installation/replacement/repair of *Appurtenances* and/or fittings. If *Contamination* is evident or suspected, the procedures prescribed under Section 2 of this procedure for Category 2 watermain breaks shall apply.

#### **1.5. Tapping of Watermains**

Where existing watermains are tapped, the pipe surface at the location of the tap shall be cleaned and disinfected using a minimum 1% sodium hypochlorite solution. Where applicable, the drill/cutting/tapping bits and all surfaces of mainstops, service saddles, tapping sleeves and valves which will come into contact with *Drinking Water* shall likewise be cleaned and disinfected using a minimum 1% sodium hypochlorite solution immediately prior to installation. If any of the disinfected surfaces come into contact with the soil and/or water in the excavation prior to use, the cleaning and disinfection procedure shall be repeated.

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.

## **1.6. Service Pipes**

*Service Pipes* of 100 mm diameter and greater shall be considered as watermains for the purposes of this procedure and shall be disinfected and tested in accordance with the requirements of ANSI/AWWA Standard C651 as modified by this procedure. For *Service Pipes* of diameter less than 100 mm, Operating Authorities shall ensure that sanitary conditions are maintained during installation/repair, and that *Flushing* is conducted before they are placed into service.

## **1.7. Return to Service of Watermains *Isolated* from the Distribution System**

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.

## 2. Watermain Disinfection Procedures for Emergency Repairs

This procedure uses a risk management approach to categorize watermain breaks based on the potential for *Contamination*. The objective of this procedure is to set minimum disinfection requirements to minimize the potential for *Drinking Water Health Hazards* during emergency/unplanned repairs resulting from the physical failure of a watermain and/or *Appurtenance* (a “watermain break”).

### 2.1. Categorization and Public Agency Notification of Watermain Breaks

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.

Refer to Appendices C (flowchart) and D (pictures) to better understand the criteria for categorizing watermain breaks.

#### 2.1.1. Category 1

An OIC may classify watermain breaks with no evident or suspected *Contamination* as Category 1. The steps described in Sections 2.2 and 2.3 of this procedure shall be followed for Category 1 watermain break repairs.

*Contamination* is typically not suspected for circumferential breaks or small leaks where flow is maintained from the break until an *Air Gap* is established and where the *Air Gap* is maintained during the repair procedure. If, at any time, *Contamination* is evident or suspected, the watermain break shall be reclassified as Category 2.

#### 2.1.2. Category 2

Watermain breaks with evident or suspected *Contamination* shall remain classified as Category 2. Watermain repairs involving more than one pipe length (generally  $\geq 6$  m) of replaced pipe are also classified as Category 2. The steps described in Sections 2.2 and 2.4 of this procedure shall be followed for Category 2 watermain break repairs.

### **2.1.3. Public Agency Notification**

#### **2.1.3.1. Category 1**

Category 1 watermain breaks are not deemed to be observations of improper disinfection in accordance with Section 16-4 of Schedule 16 of *O. Reg. 170/03*, and are not reportable to the Spills Action Centre.

This procedure does not require that the local Medical Officer of Health be notified of Category 1 watermain break repairs; however, the local Medical Officer of Health may exercise their option to require such notification. Operating Authorities may choose to provide notification to, or seek advice from, the local Medical Officer of Health at any time.

#### **2.1.3.2. Category 2**

Category 2 watermain breaks are not reportable unless an Operating Authority believes that contaminated water was directed to users. If an Operating Authority believes that contaminated water was directed to users, this will constitute an observation of improper disinfection in accordance with Section 16-4 of Schedule 16 of *O. Reg. 170/03*, and the reporting and corrective actions of Schedule 16 and the applicable Schedule 17 or 18 of *O. Reg. 170/03* shall apply.

This procedure does not require that the local Medical Officer of Health be notified of Category 2 watermain break repairs unless an observation of improper disinfection has been reported as noted above; however, the local Medical Officer of Health may exercise their option to require such notification. Operating Authorities may choose to provide notification to, or seek advice from, the local Medical Officer of Health at any time.

Notification to the Ministry is not required for Category 2 watermain breaks however if a Water Advisory is declared or a watermain break is assessed to be a Special Case as described in sections 2.4.4 and 2.4.5, the Operating Authority shall verbally notify the Ministry as soon as reasonably possible by speaking in person or on the telephone with a person. The notification shall be made to the Spills Action Centre during and after business hours.

## **2.2. Watermain Break Disinfection Procedure Common to Categories 1 and 2**

The following steps must be performed for all emergency watermain repairs (Category 1 and Category 2). Examples of typical steps for Category 1, 2 and special cases are provided in Appendices E, F and G of this procedure, respectively.

### **2.2.1. Maintenance of Flow**

The Operating Authority shall determine if flow can be maintained to the watermain break site until the watermain is excavated. This determination shall be based on risks to worker and public safety, the possibility of property damage, and/or adverse impact to the natural environment.

The Operating Authority will attempt to maintain flow from the watermain break, where possible, until an *Air Gap* is established. Flow may be reduced by throttling valves while maintaining sufficient flow from the watermain break to minimize the potential for *Contamination*. Flow may be discontinued after an *Air Gap* has been created.

If flow from the watermain break is not maintained before an *Air Gap* is established, the watermain break shall remain Category 2.

### **2.2.2. Excavation Dewatering**

Excavation dewatering shall be continued for the duration of the repairs such that the *Air Gap* between the location of the watermain break and the water in the excavation is maintained. If the water level in the excavation rises such that the *Air Gap* is not maintained after flow from the watermain break has been discontinued, then the watermain break shall be classified as Category 2.

### **2.2.3. Disinfection of Pipe and Repair Parts**

All surfaces of pipe and repair parts which will come into contact with *Drinking Water* shall be disinfected using a minimum 1% sodium hypochlorite solution immediately prior to installation. If any of the disinfected surfaces come into contact with the water and/or soil in the excavation prior to installation, the surfaces shall be cleaned and the disinfection procedure shall be repeated.



If cutting out a section of pipe, the interior surfaces of the cut ends of the existing watermain shall be disinfected using a minimum 1% sodium hypochlorite solution, swabbed or sprayed as far as can be practically reached.

#### **2.2.4. Installation of Repair Parts**

The repair parts shall be installed while ensuring that *Contaminants* do not enter the watermain.

#### **2.2.5. Post-Repair *Flushing* and Return to Normal Service**

*Flushing* shall be conducted following repairs by creating a temporary dead end downstream of the watermain break through valve operation, and *Flushing* through the location of the repair to a discharge point. Flushed water may be discharged from a hydrant, plumbing or *Appurtenances*. Where there is no discharge point to allow for *Flushing*, the Operating Authority shall tap the watermain on the downstream side of the watermain break and discharge from that point.

*Flushing* shall continue until the discharged water is visibly free from discoloration and particulates, and an *Acceptable Disinfectant Concentration* has been restored; whereupon the system can be returned to normal service, defined as having all valves returned to normal operating position.

**Exception:** Where the repair was performed using a repair sleeve and flow was maintained from the watermain break until an *Air Gap* was established, *Flushing* is not required.

Dechlorination is required for any water that is directly discharged into surface water or if the discharge into the natural environment is likely to cause an adverse effect, as per Condition 10.0 of Schedule B of the Municipal Drinking Water Licence. The discharged water is deemed to be a Class II spill for the purposes of *O. Reg. 675/98* (Classification and Exemption of Spills and Reporting of Discharges) made under the *Environmental Protection Act*. Discharges of flushed water are also regulated under Condition 5.5 of Schedule C of the Municipal Drinking Water Licence.

## **2.3. Additional Information for Category 1 Watermain Break Repairs**

### **2.3.1. Microbiological Samples (Optional)**

There is no requirement for *Microbiological Samples* to be taken following Category 1 watermain break repairs. Where the Operating Authority chooses to perform *Microbiological Sampling*, the samples shall be deemed *Drinking Water* samples within the meaning of *O. Reg. 170/03*, and the reporting/corrective actions of Schedule 16 and the applicable Schedule 17 or 18 of *O. Reg. 170/03* shall apply.

## **2.4. Additional Requirements for Category 2 Watermain Break Repairs**

In addition to the requirements described in Section 2.2 of this procedure, the following steps are required for Category 2 watermain break repairs.

### **2.4.1. Removal of *Contaminants* from Watermain**

Appropriate additional steps shall be undertaken to remove *Contaminants* from the watermain, such as:

- Physical removal of *Contaminants*;
- *Flushing* into the excavation;
- *Higher Velocity Flushing* after repairs where practical and feasible.

### **2.4.2. Additional Disinfection Procedures**

In addition to the steps in Section 2.2.3 of this procedure, site-specific disinfection procedures may also be used depending on the severity or nature of the *Contamination*. The steps may include the disinfection procedures for new watermains as per ANSI/AWWA Standard C651.

### **2.4.3. Microbiological Samples (Mandatory)**

After the completion of *Flushing*, at least one *Microbiological Sample* shall be taken and submitted as soon as reasonably possible, taking into consideration laboratory working hours and transportation timeframes.

The flow shall be directed to ensure that the sample represents water that has passed through the location of the repair. The sampling will typically occur at the point of *Flushing*, and may take place from sampling ports, hydrants, blow-offs, or premise plumbing. All samples shall be considered *Drinking Water* samples, taken and tested in accordance with *O. Reg. 170/03* requirements. The reporting and corrective actions of Schedule 16 and the applicable Schedule 17 or 18 of *O. Reg. 170/03* shall apply.

The watermain may be returned to normal service, defined as having all valves returned to normal operating position, prior to receipt of *Microbiological Sample* results.

#### **2.4.4. Special Case—Sewage Contamination**

If there is evident or suspected sewage *Contamination* of a watermain, in addition to the steps in Sections 2.2 and 2.4 of this procedure, the Operating Authority shall develop and implement a plan with site-specific procedures for disinfection and sampling. The sampling plan shall include as a minimum taking two sets of *Microbiological Samples* at least 24 hours apart.

Return to normal service is contingent upon the corrective actions and sampling plan being completed to the satisfaction of the local *Ministry* office (in consultation with local Medical Officer of Health). The affected watermain(s) may not be placed into service before the corrective actions and sampling plan are completed unless a *Water Advisory* is declared.

The disinfection requirements for new watermains as per Section 1.1.2 of this procedure may be used based on agreement between the Operating Authority and the local *Ministry* office, in consultation with the local Medical Officer of Health.

#### **2.4.5. Special Case—Chemical Contamination**

If there is evident or suspected chemical *Contamination* of a watermain, in addition to the steps in Sections 2.2 and 2.4 of this procedure, the Operating Authority shall develop and implement a plan with site-specific procedures for disinfection and/or decontamination and sampling. The Operating Authority shall finalize the plan in agreement with the local *Ministry* office, in consultation with the local Medical Officer of Health.

Return to normal service is contingent upon the corrective actions and sampling plan being completed to the satisfaction of the local *Ministry* office, in consultation with the local Medical Officer of Health. The affected watermain(s) may not be put back in service before the corrective actions and sampling plan are completed unless a *Water Advisory* is declared.

## 3. Documentation

### 3.1. Documentation for New Watermains

When installing new watermains as per Section 1.1 of this procedure, the Operating Authority shall maintain records of the following information as a minimum. The information shall be retained as per the record-keeping requirements of Section 27 of O. Reg. 128/04. This section does not require that all of the information be recorded on a single form:

- *Backflow Prevention*:
  - Air gap (as defined in CSA Standard B64.10 “Selection and Installation of Backflow Preventers) or Reduced Pressure Principle Backflow Preventer installed as per Section 4.8.9 of ANSI/AWWA Standard C651; and
  - Backflow preventer tested as per Section 1.1.1 of this procedure.
- Pre-disinfection swabbing and/or flushing have been completed.
- Disinfection Process:
  - Method of disinfection;
  - Disinfection chemical meets the requirements of both the AWWA and NSF/ANSI/CAN 60 Standards.
  - Date and time disinfection started and ended;
  - Chlorine concentration at start and end of contact time at each sampling point; and
  - Decrease in chlorine concentration in mg/L and/or percentage as applicable.
- *Microbiological Sampling* referred to in Section 1.1.3:
  - Schematic or drawing showing approximate location where *Microbiological Samples* were taken;
  - *Microbiological* and disinfectant residual sample results; and
  - For staged sampling: flow rate, time each sample was taken and calculated length.
- *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.

### 3.2. Documentation for Watermain Maintenance and Repair

When performing maintenance and repair activities as per Sections 1.4 and 2 of this procedure, the Operating Authority shall maintain records of the following information as a minimum. The information shall be retained as per the record-keeping requirements of Section 27 of *O. Reg. 128/04*. This section does not require that all of the information be recorded on a single form:

- Date.
- Location (e.g., a municipal address).
- Flow maintained at the site until *Air Gap* created.
- Watermain size and material (e.g., 150 mm cast iron).
- No evident or suspected *Contamination* of the watermain was observed before or during the repair process.
- If watermain break, indicate type of watermain break (e.g., circumferential, longitudinal, split bell, spiral, rupture, blow-out, hole, leak at main stops/tapping valves, etc.).
- If planned maintenance, indicate type of planned maintenance (e.g., valve replacement)
- *Air Gap* maintained, once established, throughout the repair process.
- Name of *Operator-in-Charge* who classified the watermain break as Category 1 (if applicable).
- Type of repair (e.g., clamp, cut out, etc.).
- Pipe and repair parts disinfected.
- Post-repair *Flushing* undertaken (if applicable).
- For Category 2, where additional steps were required under 2.4.1 and 2.4.2, describe these steps.
- 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.
- Disinfectant residual following final post-repair *Flushing*. If final disinfectant residual is less than 0.2 mg/L free chlorine in a chlorinated system or 1.0 mg/L combined chlorine in a chloraminated system, then provide the location and results of upstream disinfectant residual(s) or documented benchmarks for the area.
- *Microbiological Samples* taken (If applicable).

- Date and location(s) of sample(s) (e.g., Chain of custody).
- Date and time of return to normal service.
- *Water Advisory* declared (if applicable): Date and Time.
- Public Agency Notification (if applicable): local *Ministry* office (Date and Time).
- Public Agency Notification (if applicable): Spills Action Centre (Date and Time).
- Public Agency Notification/Direction (if applicable): local Medical Officer of Health (Date and Time).

## APPENDIX A: Examples of Reduced Pressure Principle Backflow Preventer Installations



Figure A-1: Temporary connection from a hydrant with *Backflow Prevention* using a CSA-certified reduced pressure principle backflow preventer.





Figure A-2: Temporary connection from a watermain with *Backflow Prevention* using a CSA-certified reduced pressure principle backflow preventer.

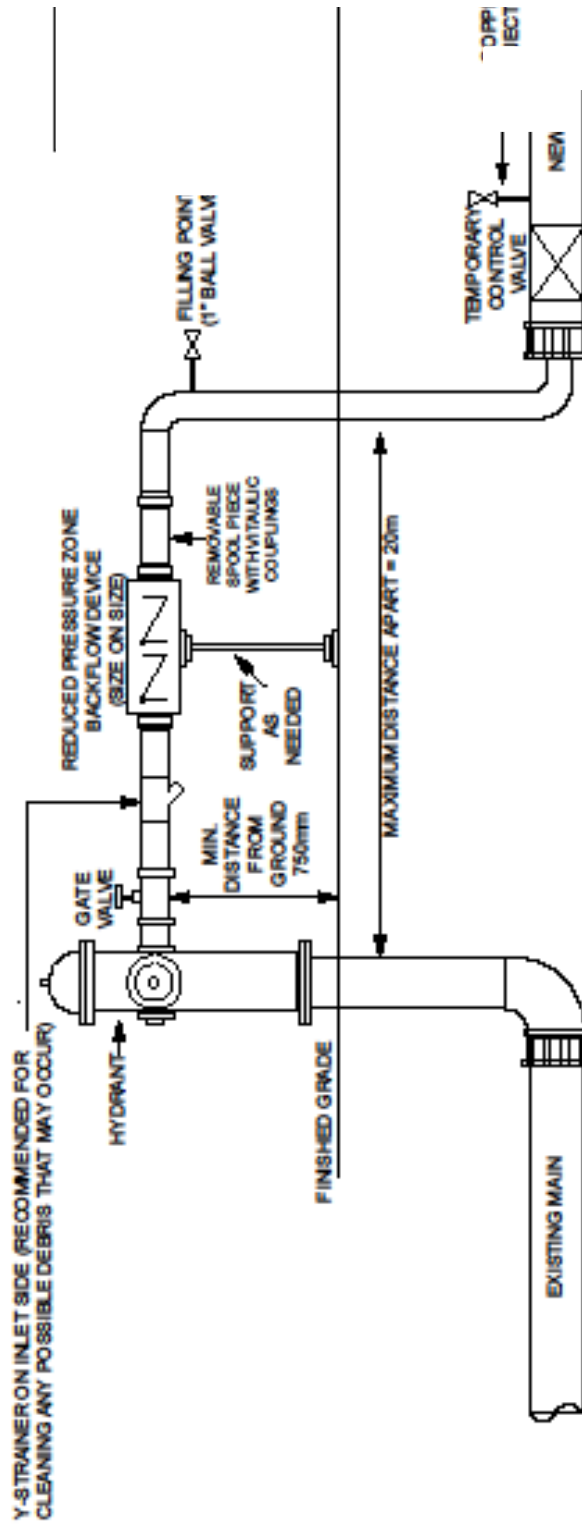


Figure A-3: Schematic of temporary connection from hydrant with Backflow Prevention using a CSA-certified reduced pressure principle backflow preventer.

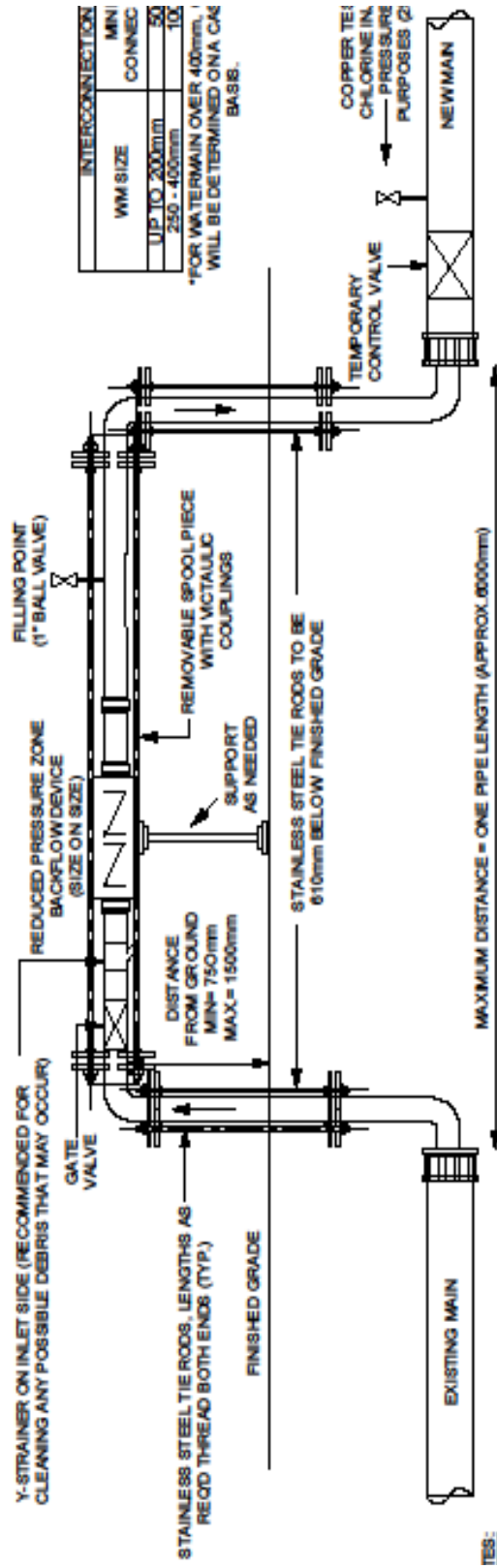


Figure A-4: Schematic of temporary connection from watermain with Backflow Prevention using a CSA-certified reduced pressure principle backflow preventer.

# APPENDIX B: 1.1.4.2. Exception for *Connections* Greater than One Pipe Length

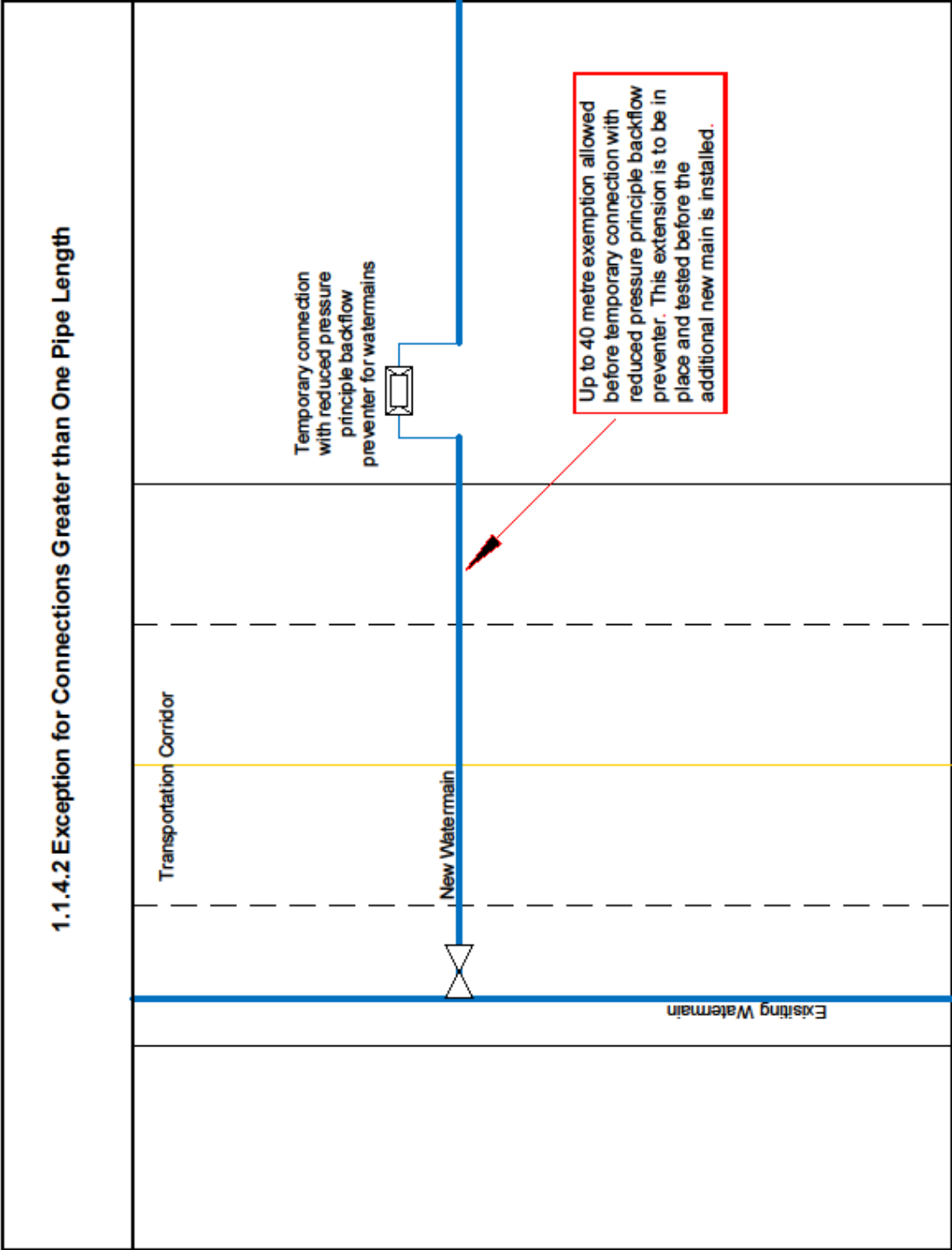
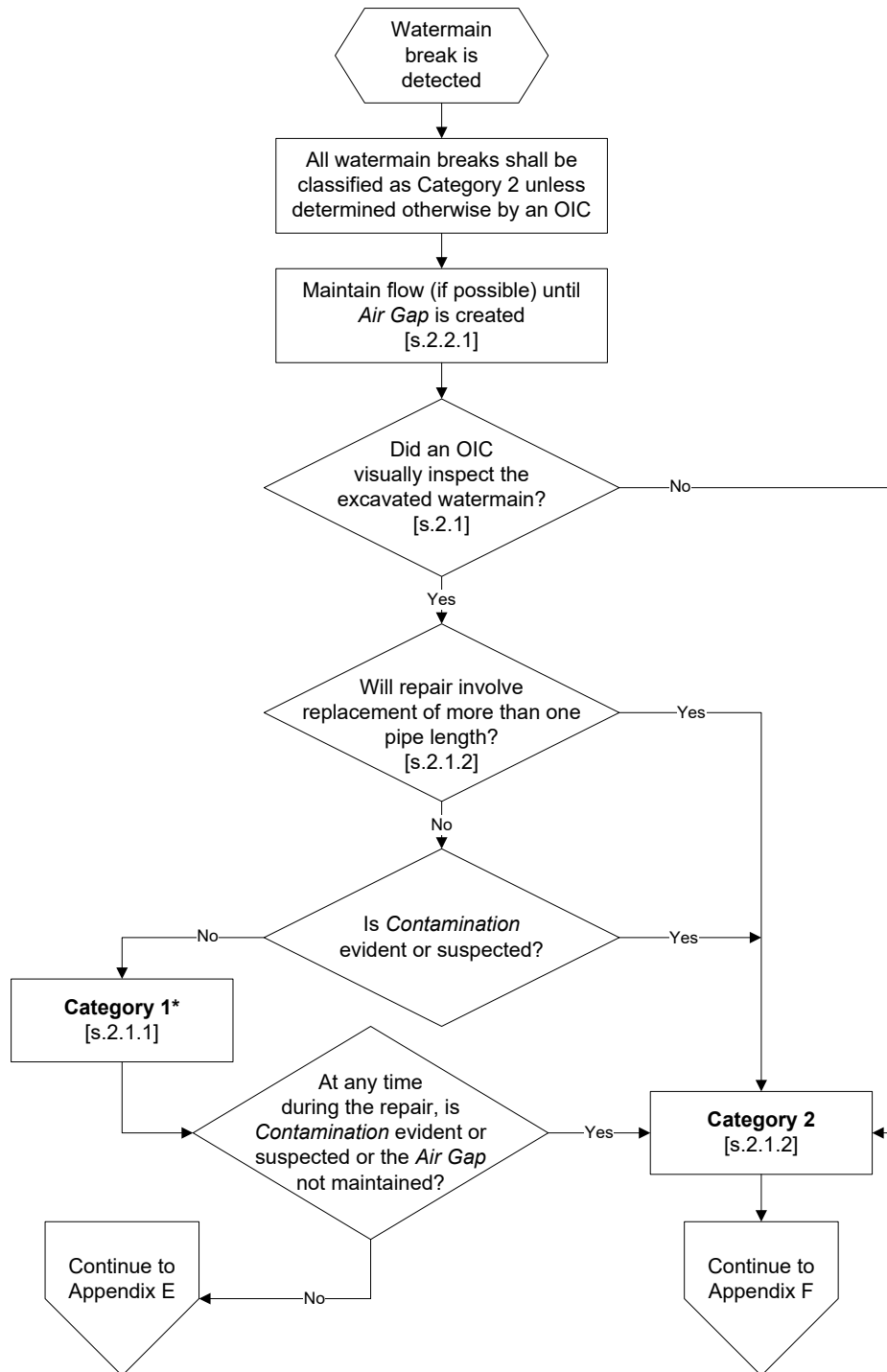


Figure B-1: Example of Exception in Section 1.1.4.2.

# APPENDIX C: Tools to Help Determine the Category of Watermain Break—Flowchart

The following flowchart will help determine the categories of watermain breaks.



\*An OIC must remain on-site throughout a Category 1 repair to assess the evidence of *Contamination* or suspected *Contamination*. If an OIC cannot be present for the duration of the repair, the watermain break shall remain as a Category 2.

## APPENDIX D: Tools to Help Determine the Category of Watermain Break—Pictures

Examples of watermain breaks that are typical of Category 1 are included below for illustrative purposes only:



Figure D-1: Circumferential watermain break with flow maintained until after an *Air Gap* was established.



Figure D-2: Corrosion hole leak in a watermain with flow maintained until after an *Air Gap* was established.

Examples of watermain breaks that are typical of Category 2 are included below for illustrative purposes only:



Figure D-3: Longitudinal watermain break with evident Contamination.

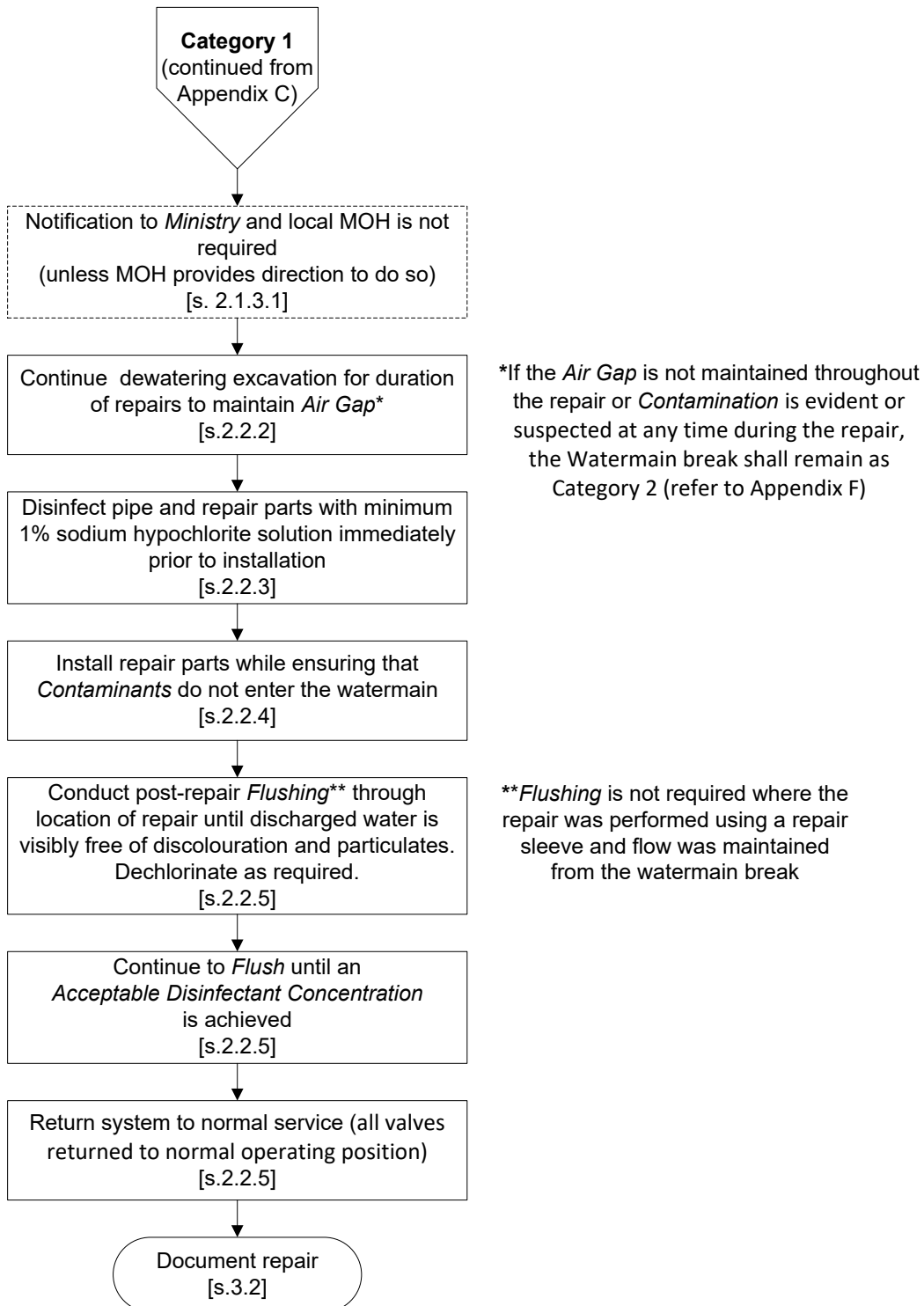


Figure D-4: Spiral watermain break with evident Contamination.



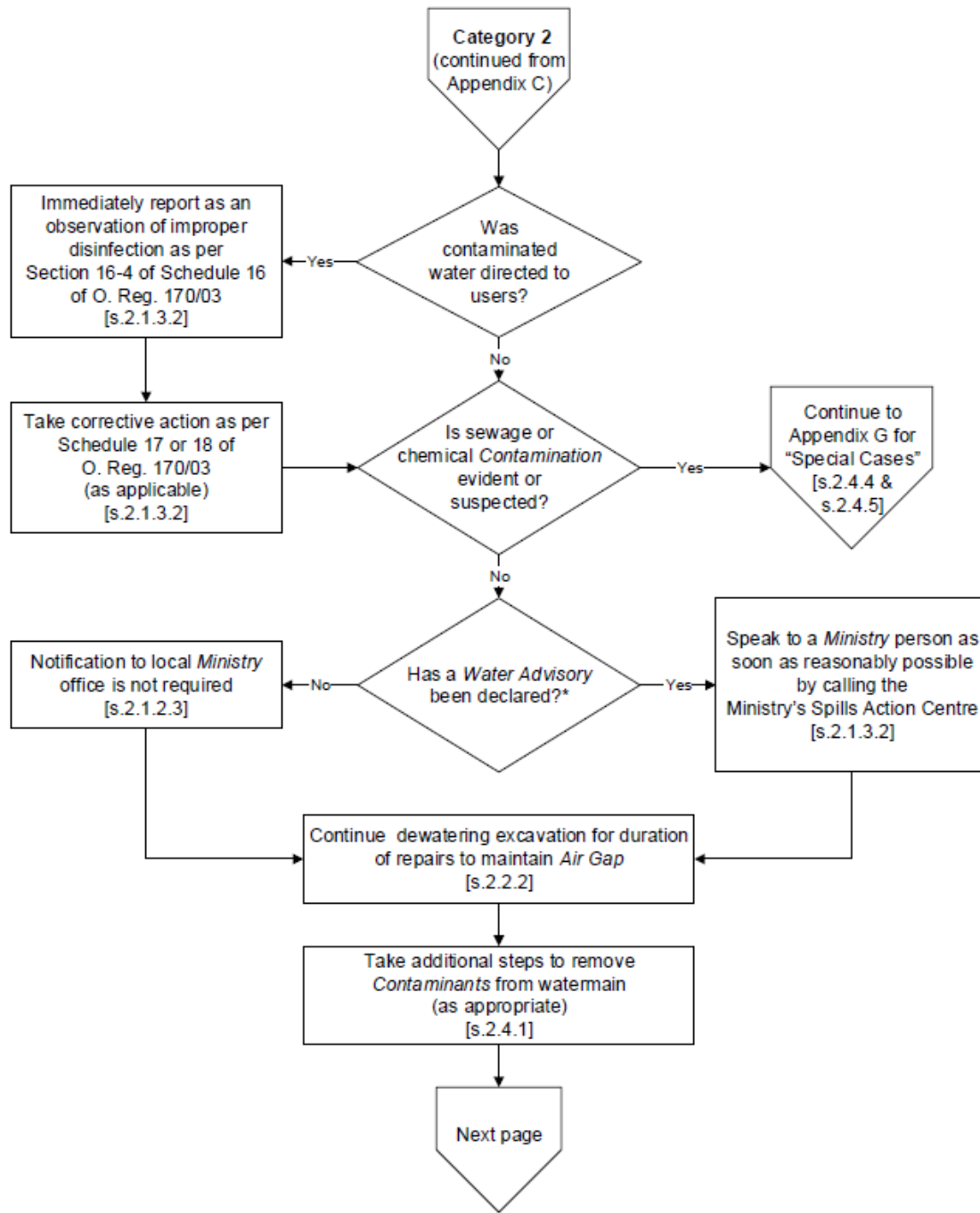
## APPENDIX E—CATEGORY 1 FLOWCHART

The following flowchart is an example of the typical steps required for **Category 1** watermain breaks. **Note:** These steps also apply to the planned maintenance of watermain *Appurtenances* and fittings (refer to Section 1.4). Any additional directions given by the *Ministry* and/or the local Medical Officer of Health must be followed.

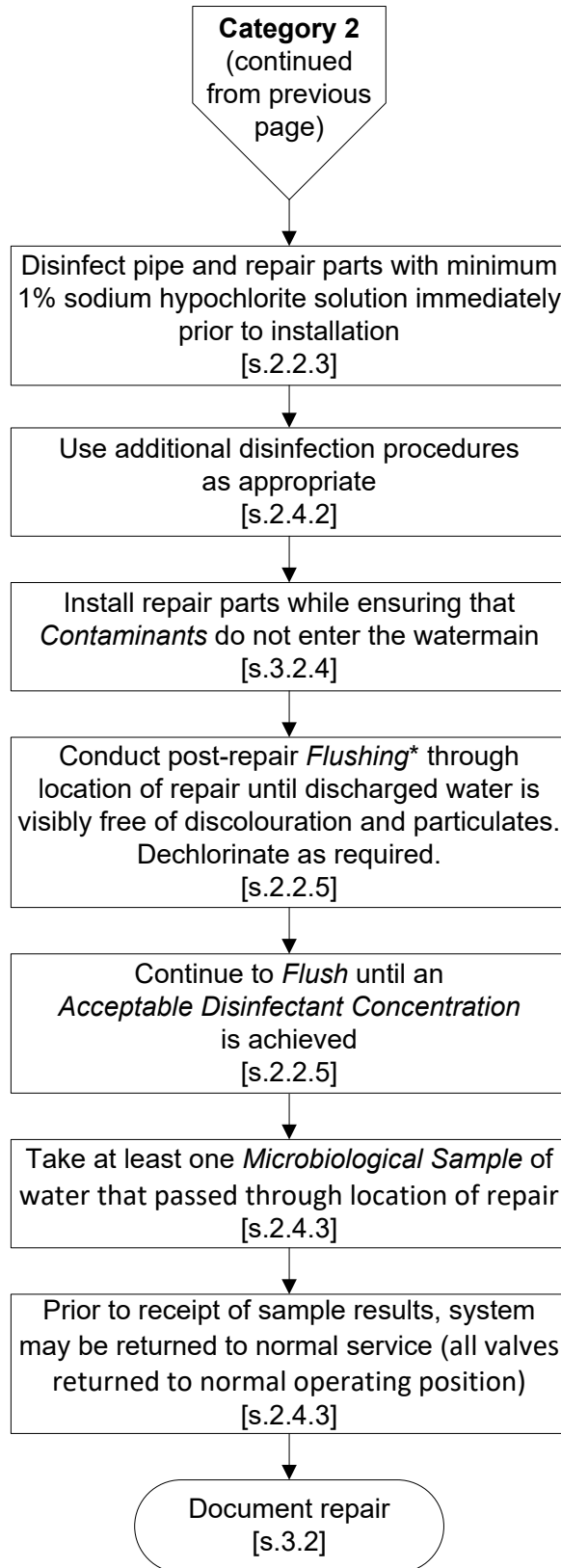


## APPENDIX F—CATEGORY 2 FLOWCHARTS

The following flowchart is an example of the typical steps required for **Category 2** watermain breaks. **Note:** The sequence of actions may be varied as appropriate for the specific situation. Any additional directions given by the *Ministry* and/or the local Medical Officer of Health must be followed.



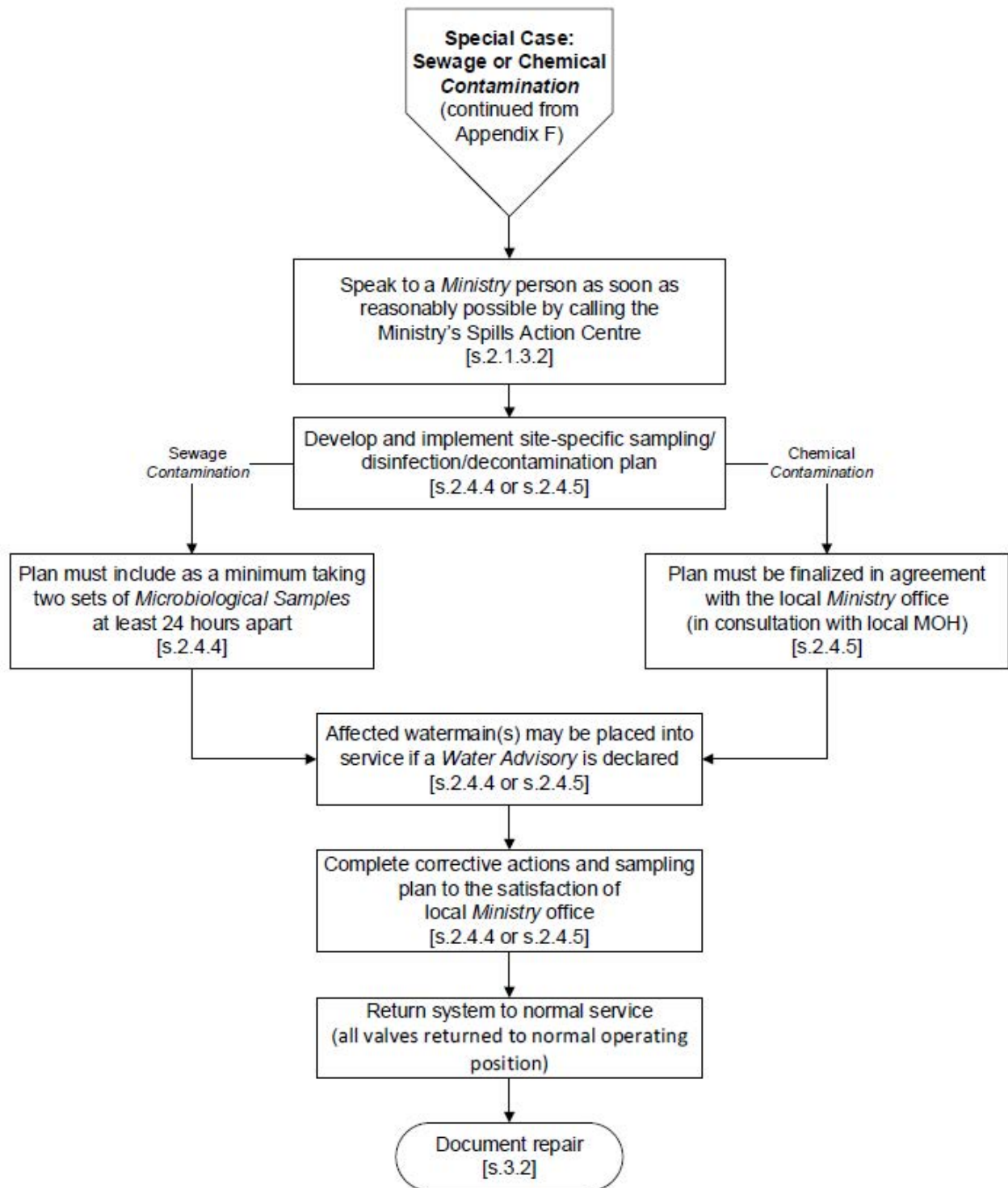
\*Local MOH may exercise their option to require notification for all Category 2 watermain breaks



\**Flushing* is not required where the repair was performed using a repair sleeve and flow was maintained from the watermain break

## APPENDIX G—SPECIAL CASE FLOWCHART

The following flowchart depicts the requirements for special case *Contamination* (sewage or chemical) as a result of a watermain break.



## APPENDIX H: Definitions

In this procedure,

**“Acceptable Disinfectant Concentration”** means:

- a) a disinfectant concentration of at least 0.2 mg/L free chlorine residual in a chlorinated system or 1.0 mg/L combined chlorine residual in a chloraminated system; or, if these disinfectant concentrations cannot be achieved,
- b) a disinfectant concentration that is representative of the residual in the area, determined by testing upstream and downstream from the testing location or by using documented benchmarks for the area, as long as free chlorine concentrations are at least 0.05 mg/L in a chlorinated system and combined chlorine concentrations are at least 0.25 mg/L in a chloraminated system.

**“Air Gap”** means a space at the location of the maintenance/repair between the exterior surface of the watermain and the interior surfaces of the excavation, including the water in the excavation, sufficient to prevent water, soil or any other *Contaminant* in the excavation from contacting the watermain, fittings, or *Appurtenances* throughout the maintenance/repair process.

**“Appurtenance”** means an appurtenance, within the meaning of *O. Reg. 170/03*, which is in contact with the *Drinking Water*.

**“Backflow Prevention”** means the prevention of a reversal of normal flow that could introduce *Contamination* to the *Drinking Water System*.

**“Certified Operator”** means certified operator within the meaning of *O. Reg. 170/03*.

**“Connection”** means all watermain and *Appurtenances* installed between an existing watermain and a new or future watermain/*Appurtenance*.

**“Contaminant”** means foreign matter that is not intended to enter a watermain.

**“Contamination”** means the introduction of a *Contaminant* into a watermain.

**“Directly Supervised”** 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*.

**“Drinking Water”** means drinking water within the meaning of the *Safe Drinking Water Act*.

**“Drinking Water Health Hazard”** means drinking water health hazard within the meaning of the *Safe Drinking Water Act*.

**“Drinking Water System”** means drinking water system within the meaning of the *Safe Drinking Water Act*.

**“Flushing”** 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.

**“Higher Velocity Flushing”** means flushing of a watermain with sufficient velocity to discharge settled materials.

**“Isolate”** means operate valves to ensure that there is no flow of water to or from a specific section of watermain.

**“Microbiological Samples”** means water samples taken and tested for *Escherichia coli* and Total Coliforms by a licensed and accredited laboratory.

**“Ministry”** means the Ministry of the Environment, Conservation and Parks.

**“Operator-in-Charge”** means an operator-in-charge within the meaning of *O. Reg. 128/04*.

**“Service Pipe”** means a service pipe within the meaning of *O. Reg. 170/03*.

**“Water Advisory”** means a boil or drinking water advisory for the area being serviced by the affected watermain declared by the local Medical Officer of Health.

**“Water Quality Analyst”** means a water quality analyst within the meaning of *O. Reg. 128/04*.