

Water Treatment Plant Disinfection Procedure August 2026

Version 1.1

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

This *Water Treatment Plant Disinfection Procedure* (“this 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 refers to ANSI/AWWA Standard C653 - “Standard for Disinfection of Water Treatment Plants”, the current version of the standard shall be used. The section numbers in this procedure match the section numbers of the 2020 version of AWWA C653. When an updated version of the standard is released, its corresponding section(s) and amended wording will supersede the requirements of the previous version.

Definitions listed in Appendix A are capitalized and italicized throughout this procedure.

Table A (below) shows the applicable *Disinfection* procedure for each *Component* by location. Determine the proper *Disinfection* procedure for a particular *Component* by selecting its location from the “Location” column of Table A. Find the specific *Component* to be *Disinfected* within the rows for the selected location. Use the procedure named in the column heading above the selected *Component* to *Disinfect* that *Component*. Sampling and documentation shall be completed as per the identified procedure, unless otherwise indicated in Section 5 of this procedure.

Table A: Applicable *Disinfection* Procedures by Location and *Component*¹

Location	<i>Water Treatment Plant Disinfection Procedure</i>	<i>Water Storage Facility Disinfection Procedure</i>	<i>Watermain Disinfection Procedure</i>
Water Treatment Plant	Filters, Filter basins and contents	<i>Raw Water Tanks</i> ^{2,3,4}	<i>Raw Water Piping and Appurtenances</i> ^{2,3,4}
Water Treatment Plant	<i>Process Water Pumps</i> and Ultraviolet Units	<i>Process Water Tanks and Drinking Water Tanks</i> ⁴	<i>Process Water Piping and Appurtenances</i> ⁴
Water Treatment Plant	<i>Drinking Water Pumps</i>	<i>Raw</i> ^{2,3} , <i>Process</i> , and <i>Drinking Water Pressure Vessels</i> ^{4,5}	<i>Drinking Water Piping and Appurtenances</i> ⁴
Distribution System	<i>Drinking Water Pumps</i>	<i>Drinking Water Storage Facilities</i> ^{4,5}	<i>Drinking Water Piping and Appurtenances</i> ⁴

Footnotes Associated with Table A:

1. Any water used for the purposes of, but not limited to, flushing, cleaning, and *Disinfection* shall be *Drinking Water*. In a water treatment plant, if *Drinking Water* is not available, water that has received the highest level of treatment available may be used.
2. *Raw Water* of *Drinking Water Systems* that use chlorination prior to filtration as part of their *Log Removal/Inactivation Credit* calculations is not considered *Raw Water* for this procedure. It is considered *Process Water*. *Operating Authorities* who want this water considered as *Raw Water* for this procedure may seek approval from the *Director* for a deviation.
3. *Raw Water Piping/Tanks*:
 - For systems using a well as a *Raw Water* source, *Raw Water Piping* only includes the *Piping* from the well to the water treatment plant. *Piping* within the well is to be *Disinfected* as per the *Municipal Drinking Water Well Disinfection Procedure*.
 - *Raw Water Piping* and *Appurtenances* that convey the following shall be cleaned as per the *Watermain Disinfection Procedure*:
 - surface water
 - “Groundwater Under Direct Influence of Surface Water (GUDI) without adequate insitu filtrationNo *Disinfection* is required for these *Raw Water Piping* and *Appurtenances*.
 - *Raw Water Tanks* that contain surface water or “GUDI without adequate insitu filtration” shall be cleaned as per the *Water Storage Facility Disinfection Procedure*. No *Disinfection* is required.
 - *Raw Water Piping* and *Appurtenances* that convey non-GUDI groundwater or “GUDI with adequate insitu filtration” shall be cleaned, *Disinfected*, and sampled as per the following sections of the *Watermain Disinfection Procedure*:
 - Section 1 for addition, modification, replacement, extension, and planned maintenance. If applicable, *Microbiological Sampling* as per Section 1.1.3 of the *Watermain Disinfection Procedure* is required.
 - *Microbiological Sampling* of *Drinking Water* as per Section 1.1.4 of the *Watermain Disinfection Procedure* is not required. The *Operating Authority* may request additional *Treated Water Microbiological Samples* to verify that the *Piping* and *Appurtenances* have been adequately *Disinfected*. Samples should be collected from a *Treated Water* sampling point once water from the *Disinfected Piping* and *Appurtenances* is believed to have achieved “primary disinfection”.
 - Section 2 for emergency repairs of existing *Piping* and *Appurtenances*. *Microbiological Sampling* as per Section 2.4.3 of the *Watermain Disinfection Procedure* is optional.

- *Raw Water Tanks* that contain non-GUDI groundwater or “GUDI with adequate insitu filtration” shall be cleaned, *Disinfected* and sampled as per the *Water Storage Facility Disinfection Procedure*.
- 4. *Disinfection* as per the *Water Storage Facility Disinfection Procedure* is required for the *Isolated* portions of the *Storage Facility* inlet, outlet, washdown, recirculation and drain *Pipes*.
- 5. For *Disinfection of Pressure Vessels* that cannot withstand high chlorine concentrations, use one of the following methods:
 - chlorination method 1 of the *Water Storage Facility Disinfection Procedure* with 6 hours retention period even if chlorine was hand poured
 - chlorination method 2 of the *Water Storage Facility Disinfection Procedure*

Operating Authorities shall use *Certified Operators* for activities that must be performed by a *Certified Operator*. *Water Quality Analysts* may perform sampling and testing if permitted through regulation. *Components* may only be *Isolated* and placed into service by *Certified Operators*. Activities performed on *Isolated Components* are not required to be performed by *Certified Operators* (unless specified otherwise in this procedure). These activities, including taking *Microbiological Samples* and performing chlorine residual concentration testing, may be performed by any person authorized by the *Operating Authority*.

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

Deviations from the requirements of this procedure shall be requested and approved in advance by the *Director*.

1. Modifications to Section 1 of AWWA C653 – General

Operating Authorities shall ensure that the requirements of AWWA C653, as modified by this procedure, are followed. For clarity, where this procedure states no *Disinfection* is required for a *Component*, the *Microbiological Sampling* required after its *Disinfection* is also not required.

No *Disinfection* is required if a filter is emptied and no maintenance is performed, provided the *Operating Authority* is satisfied that sanitary practices were used. Examples of sanitary practices are:

- Cleaning observation hatches (or covers as applicable) and immediate area of loose dirt and debris prior to opening
- If applicable, cleaning boots and spraying with a minimum 1% chlorine solution immediately prior to entering the filter

Where an *Operating Authority* believes that *Contaminated* or improperly *Disinfected* water was directed to users, the reporting requirements from Schedule 16-4 of [Ontario Regulation 170/03](#) shall apply. The applicable corrective actions outlined in Schedules 17 or 18 of [O. Reg. 170/03](#) shall also apply.

2. Modifications to Section 2 of AWWA C653 – References

In addition to the standards referred to in Section 2 of AWWA C653, this procedure refers to these three *Ministry's* procedures:

- [Watermain Disinfection Procedure](#)
- *Water Storage Facility Disinfection Procedure*
- *Municipal Drinking Water Well Disinfection Procedure*

In their latest editions, these three documents form a part of this procedure to the extent specified within this procedure.

3. Modifications to Section 3 of AWWA C653 – Definitions

Appendix A of this procedure includes additional definitions, beyond those in Section 3 of AWWA C653. In case of conflict, the definitions from this procedure will supersede the definitions of AWWA C653.

Where AWWA C653 refers to *Potable Water*, the definition of *Drinking Water* in Appendix A shall be used.

4. Modifications to Section 4 of AWWA C653 – Requirements

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

4.1 Materials and Cleaning

No modification to this section.

4.2 Units Requiring *Disinfection*

This section applies to any *Component* requiring *Disinfection* using this procedure as per Table A and its associated footnotes. Prior to placing into service, *Operating Authorities* shall clean chemical feed system *Components*. *Components* of chemical feed system at or after the first inactivation process, other than a disinfectant feed system, shall be *Disinfected*. Examples of inactivation processes are chlorination, ultraviolet lights and ozone. The *Disinfection* shall be performed by rinsing with a solution at a minimum 200 mg/L chlorine concentration. *Operating Authorities* may require a retention time after the chlorine solution is applied. Spraying or swabbing are acceptable alternatives to rinsing.

When dealing with chemicals that are not compatible with chlorine, *Operating Authorities* shall consider rinsing with *Drinking Water* following the chlorine rinse.

4.3 Forms of Chlorine for *Disinfection* and Rinsing

Chemicals used for *Disinfection* shall meet the requirements of both of these standards:

- American Water Works Association ("AWWA")
- American National Standards Institute ("ANSI") safety criteria standard [NSF/ANSI/CAN 60](#).

The same requirements apply for the chlorine solution used for rinsing as per section 4.2 of this procedure. The equipment used to apply the chlorine solution is not required to meet the requirements of [NSF/ANSI/CAN 61](#). It shall however only be used for chlorine solution applications. Deviations allowing the use of alternate *Disinfection* chemicals (for example, hydrogen peroxide) shall be requested and approved in advance by the *Director*.

4.4 Plant *Disinfection* Procedures

Handling of Water Discharges to the Natural Environment

Operating Authorities shall take steps to ensure that discharges of water to the natural environment comply with Condition 10.0 of Schedule B of the Municipal Drinking Water Licence. This includes following the requirements of Section 4.4.3.6 of AWWA C653 for dechlorination. Follow ANSI/AWWA C655: Field Dechlorination, until the total chlorine residual concentration is no more than 0.02 mg/L in any of these situations:

- for any water that is directly discharged into surface water
- if the discharge into the natural environment is likely to cause an adverse effect

If the dechlorinated discharged water meets the requirements of Condition 5.5 of Schedule C of the Municipal Drinking Water Licence, the discharge is considered a Class I spill. Class I spills are defined in [Ontario Regulation 675/98](#) made under the [Environmental Protection Act](#).

Operating Authorities may allow the use of hydrogen peroxide in addition to the dechlorination chemicals mentioned in Section 4.2.3 of ANSI/AWWA C655: Field Dechlorination. Deviations allowing the use of other alternate dechlorination chemicals shall be requested and approved in advance by the *Director*.

4.4.1 Plant Piping

In lieu of Section 4.4.1 of AWWA C653, this procedure divides plant *Piping* into 3 categories: *Raw Water Piping*, *Process Water Piping*, and *Drinking Water Piping*. Refer to Table A and associated footnotes for the *Disinfection* requirements.

4.4.2 Tanks and Clearwells

Cleaning, *Disinfection*, and sampling for *Tanks* and clearwells shall be performed as per the *Water Storage Facility Disinfection Procedure*.

4.4.3 Filters

Operating Authorities shall follow the applicable *Disinfection* requirements in Sections 4.4.3.3 and 4.4.3.4 of AWWA C653. In addition, *Operating Authorities* shall spray all filter walls above normal operating water level (such as freeboard) that may come in contact with water. The spraying shall be performed using a minimum 200 mg/L chlorine solution. *Operating Authorities* may require a retention time after the 200 mg/L chlorine solution is applied.

The following sections include additional requirements to Section 4.4.3 of AWWA C653:

A – Filters with Granulated Activated Carbon (GAC)

For Granulated Activated Carbon (GAC) filters, the spraying of filter walls above normal operating water level mentioned above shall occur prior to adding the GAC to the filter.

When GAC is added to a filter, the *Operating Authority* shall ensure that sanitary practices are used when storing, handling, and installing the GAC. This includes the cleaning and *Disinfection* steps for equipment and workers from section 4.4.3.5 of AWWA C653.

B – Cartridge Filters

For clarity, this section is not intended for routine filter cartridge replacements. This section only applies to the following activities:

- the initial installation of cartridge filter units
- a situation in which these filter units are taken out of service for maintenance or repair
- any other activity or event that might lead to water being *Contaminated*

Filter cartridges shall be stored, handled and installed using sanitary practices. No *Disinfection* of the cartridge or housing is required if only replacing a cartridge and sanitary practices were followed.

Raw Water filter housings require cleaning as per Section 4.1 of AWWA C653, but do not require *Disinfection*.

Process Water filter housings require cleaning as per Section 4.1 of AWWA C653. *Disinfect* filter housings by one of these two methods:

- Spraying all surfaces that come in contact with water with a minimum 1% chlorine solution.
- Filling the filter housing with a chlorine solution of not less than 10 mg/L and retain for a minimum of 6 hours. If an *Operating Authority* cannot wait for the 6-hour retention period, the *Operating Authority* may:
 - use a chlorine solution of not less than 60 mg/L
 - retain the solution for a minimum of 1 hour

If a *Process Water* filter cartridge is temporarily removed during maintenance and sanitary practices are followed, no *Disinfection* of the cartridge is required.

C- Membrane Filters

When membrane units are submerged in a filter basin, the spraying of filter basin walls above normal operating water level mentioned above shall occur prior to installing the membranes.

If the *Operating Authority* ensures that sanitary practices are used during storage, handling, installation and repairs, polymer-based membranes do not require *Disinfection*. These membranes require:

- Flushing when deemed appropriate by the *Operating Authority*.
- Maintenance cleaning prior to placing into service. Maintenance cleaning is not required following pinning of membrane fibres contained in cylinders.

For other types of membranes (for example, ceramic), deviations from the requirements of this procedure shall be requested and approved in advance by the *Director*.

D - Greensand Filters

Raw Water greensand filters require cleaning as per Section 4.1 of AWWA C653, but no *Disinfection* unless requested by the *Operating Authority*.

Process Water greensand filters require cleaning as per Section 4.1 of AWWA C653 and *Disinfection* as per Section 4.4.3.3 of AWWA C653.

4.4.4 Water Pumps

Operating Authorities shall use the following steps for *Disinfection* of *Process Water* or *Drinking Water Pumps*:

1. Clean or flush the pump.
2. *Disinfect* by using one of these methods:
 - Spray all surfaces that come in contact with water with a minimum 1% chlorine solution.
 - Fill the pump with a chlorine solution of not less than 10 mg/L and retain for a minimum of 6 hours. If an *Operating Authority* cannot wait for the 6-hour retention period, the *Operating Authority* may:
 - use a chlorine solution of not less than 60 mg/L
 - retain the solution for a minimum of 1 hour
3. Where possible, flush the pump until both of the following conditions are met:

- the water appears visibly free from discoloration and particulates
- the chlorine residual concentration is acceptable to the Operating Authority

4.4.5 Ultraviolet Units

As long as sanitary practices are maintained, *Disinfection* is not required for Ultraviolet (UV) unit:

- bulb replacement
- sleeve cleaning or replacement
- sensor servicing or replacement

For new installation or replacement of UV units, the *Operating Authorities* shall follow the manufacturer's *Disinfection* procedures or instructions that pertain to the UV unit.

5. Modifications to Section 5 of AWWA C653 – Verification

5.1 Water Quality Sampling and Testing

The sampling and testing requirements in this section apply to any *Component* requiring *Disinfection* as per this procedure as per Table A and its footnotes.

5.1.1 General Requirements - Microbiological Sampling and Chlorine Testing

All *Microbiological Samples* shall be taken and handled as per the *Ministry's [Practices for the Collection and Handling of Drinking Water Samples](#)* document (as amended).

When *Microbiological Samples* are taken from an *Isolated Component*, additional samples shall be taken at the same time from the same location. These samples shall be tested immediately for one of the parameters below:

- free chlorine residual concentration if the system provides chlorination and does not provide chloramination
- combined chlorine residual concentration if the system provides chloramination

Any person authorized by the *Operating Authority* may take *Microbiological Samples* from *Isolated Components* and perform the associated chlorine residual concentration tests.

Operating Authorities shall use a *Chlorine Meter* to test the chlorine concentrations for compliance with the *Disinfection* requirements as per Section 4 of this procedure. The *Ministry* does not allow the use of test strips to measure the chlorine concentrations recorded to demonstrate compliance with this procedure.

Operating Authorities may allow the concentration to be calculated in these two situations where it is impractical:

- to measure the chlorine concentration of a solution used for *Disinfection*
- to take samples for chlorine concentration testing from the *Component* after it has been filled

Microbiological Sample results obtained from *Isolated* water treatment plant and/or *Component* shall be uploaded to the *Ministry's* database by the laboratory. Non-*Satisfactory* results from these samples are not reportable under Schedule 16 of [O. Reg. 170/03](#).

If non-*Satisfactory Microbiological Sample* results are received (show the presence of *Escherichia coli* or Total Coliforms), refer to the instructions in Section 5.1 of AWWA C653. When refilling a *Component* with *Raw* or *Process Water* after *Disinfection*, corrective actions after non-*Satisfactory Microbiological Samples* shall be at the discretion of the *Operating Authority*.

5.1.2 Plant Piping and Appurtenances

For clarity, *Operating Authorities* shall sample any *water Piping* and *Appurtenances* requiring *Disinfection* as per the following sections of the *Watermain Disinfection Procedure*:

- New *Piping* (including *Appurtenances*): Sections 1.1.3 or 1.1.4, as applicable, of the *Watermain Disinfection Procedure*.
- Planned maintenance of *Appurtenances* and fittings: Section 1.4 of the *Watermain Disinfection Procedure*.
- Emergency repairs of *Piping*: Section 2 of the *Watermain Disinfection Procedure* (if sampling is required).

5.1.3 Filters

A - Cartridge Filters

The sampling requirements in this section apply to any cartridge filter housings requiring *Disinfection* as per Section 4.4.3 of this procedure.

An *Operating Authority* may allow a cartridge filter to be placed into service with no *Microbiological Sample* if all the following criteria are met:

- a *Certified Operator* is present to witness the *Disinfection* of the cartridge filter housing
- this *Certified Operator* ensures that the sanitary practices and *Disinfection* requirements as per Section 4.4.3 B of this procedure are met

If no *Certified Operator* is present, the *Operating Authority* shall ensure that one *Microbiological Sample* is taken from water that has been directed through the cartridge filter.

B - Other Filters

The sampling requirements in this section apply to any filter basins, membranes, greensand filters and any other type of filters other than cartridge filters. For filters with GAC, *Operating Authorities* shall obtain the *Microbiological Samples* prior to adding the GAC.

After the *Disinfection* steps are completed, and before a *Disinfected* filter is placed into service, the *Operating Authority* shall take a minimum of two *Microbiological Samples*. The samples are to be taken a minimum of 30 min apart, from one location at the filter. The *Operating Authority* shall endeavour to have water flow continuously from the sample point between *Microbiological Samples*.

Although the *Microbiological Sampling* location is at its discretion, the *Operating Authority* shall endeavour to take the samples from the filter outlet *Piping*. The *Operating Authority* may also require taking additional *Microbiological Samples* at any other locations.

5.1.4 Water Pumps or UV Units

The sampling requirements in this section apply to any *Drinking Water* and *Process Water* pumps requiring *Disinfection* using this procedure as per Table A and its associated footnotes. The sampling requirements in this section apply to any UV units where *Disinfection* is performed. No sampling is required for work on UV units that do not require *Disinfection*.

An *Operating Authority* may allow a water pump or a UV unit to be placed into service with no *Microbiological Sample* if all the following criteria are met:

- a *Certified Operator* is present to witness the *Disinfection* of the water pump or UV unit
- this *Certified Operator* ensures that the sanitary practices and *Disinfection* requirements as per sections 4.4.4 or 4.4.5, as applicable, of this procedure are met

If no *Certified Operator* is present, the *Operating Authority* shall ensure that one *Microbiological Sample* is taken from water that has been directed through the pump or UV unit.

Operating Authorities shall endeavour to take *Microbiological Samples* and associated chlorine residual tests from water that came only from the new/repairs pump or UV unit. This is preferable to sampling from a combined header where the water from the pump or UV unit is mixed with other water.

5.1.5 Suggested Sampling in Section 5.1 of AWWA C653

Section 5.1 of AWWA C653 suggests testing for turbidity, pH, alkalinity, odour and specific conductance when a *Disinfected Component* is filled but not immediately placed into service. This testing shall be considered as optional and at the discretion of the *Operating Authority*. Determinations of acceptable values for these parameters and corrective action(s) shall be at the discretion of the *Operating Authority*.

5.1.6 Placing *Components* into Service

Operating Authorities shall endeavour to place *Disinfected Components* into service as soon as possible after receiving *Satisfactory Microbiological Sample* results. *Operating Authorities* shall ensure that sanitary practices are followed after *Disinfection* to prevent possible *Contamination* until *Components* are placed into service.

Determination of acceptable chlorine residual concentration(s) prior to placing the *Isolated Component* into service shall be at the discretion of the *Operating Authority*.

If a filter is filled **after being left empty** more than 5 days after the *Component* was *Disinfected*:

- The *Operating Authority* shall obtain one set of *Microbiological Samples* as per Section 5.1.1 of this procedure. These samples are not required for *Process Water* cartridge filters that do not provide *Log Removal/Inactivation Credits* or *Raw Water* cartridge filters.
- The *Operating Authority* shall wait for *Satisfactory Microbiological Sample* results prior to placing the *Component* into service. “Exception – Placing *Component* into Service Prior to Receiving *Microbiological Sample* Results” from Section 5.1.7 of this procedure does not apply.

If a *Process Water* filter was not placed into service within 5 days **after being filled** after *Disinfection*, the *Operating Authority* shall flush/backwash/backpulse, or any additional measures at the discretion of the *Operating Authority* until both conditions below are met:

- the filter effluent turbidity is below 1.0 NTU
- the *Operating Authority* deems the filter contents fit to be directed to the next treatment process

5.1.7 Exception – Placing *Components* into Service Prior to Receiving *Microbiological Sample* Results

The intent of this procedure is for *Operating Authorities* to keep *Disinfected Components* requiring *Microbiological Sampling Isolated* until *Satisfactory Microbiological Sample* results are received.

There are circumstances where it may be impractical to wait for the *Microbiological Sample* results before placing the *Disinfected Component* into service (meaning, water directed to users). The following are examples of acceptable circumstances:

- when the ability to meet *Drinking Water* demand may be compromised
- when stored *Drinking Water* levels may fall below acceptable limits

In these circumstances, the *Operating Authority* may place an *Isolated Component* into service prior to receiving *Satisfactory Microbiological Sample* results. Notification to the local *Ministry* Office and the local Medical Officer of Health is not required if an *Operator-in-Charge* confirms cleaning and *Disinfection* of the *Component* met this procedure.

Any *Drinking Water Microbiological Samples* and their associated chlorine residual concentration tests shall be deemed as *Drinking Water* samples within the meaning of [O. Reg. 170/03](#):

- these samples and tests shall be taken by a *Certified Operator* or a *Water Quality Analyst*
- *Microbiological Sample* results shall be uploaded to the *Ministry's* database by the laboratory
- the following shall apply to adverse Microbiological Sample and/or chlorine residual concentration test results:
 - the reporting requirements outlined in Schedule 16-3 of [O. Reg. 170/03](#)
 - the applicable corrective actions outlined in Schedules 17 or 18 of [O. Reg. 170/03](#).

For *Disinfected Raw or Process Water Components*, the *Operating Authority* shall arrange to take all the following samples:

- The *Microbiological Samples* from the *Isolated Component* as per Section 5.1.1 of this procedure.
- Additional *Microbiological Samples* and chlorine concentration tests from the *Treated Water* sampling point. These shall be taken at an estimated point in time when both of the following criteria are met:
 - the water from the *Disinfected Component* is believed to have achieved "primary disinfection"
 - the water has reached the *Treated Water* sampling point

5.2 Record of Compliance (Documentation)

When using this procedure, *Operating Authorities* 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](#) and Condition 13.0 of Schedule B of the Municipal Drinking Water Licence. This section does not require that all the information be recorded on a single form.

- Statement that all surfaces of *Components* requiring cleaning were cleaned as per Section 4.1 of AWWA C653.
- If applicable, statement that chemical system *Components* requiring cleaning and rinsing, as per Section 4.2 of this procedure, were:
 - rinsed (or alternatively sprayed or swabbed) with a solution at a minimum 200 mg/L chlorine concentration
 - rinsed with *Drinking Water* afterwards if necessary

- Type of water used for cleaning and/or *Disinfection* (*Raw, Process or Drinking Water*).
- For the chemical used for *Disinfection*, include all the following items:
 - name and form of chemical
 - concentrations as required
 - statement that it meets the requirements of both the AWWA and NSF/ANSI/CAN 60 Standards
- ***Disinfection Procedure:***
 - If *Disinfection* using the *Watermain Disinfection Procedure* was required, refer to Section 3 of the *Watermain Disinfection Procedure* for required documentation.
 - If *Disinfection* using the *Water Storage Facility Disinfection Procedure* was required, refer to Section 5.2 of the *Water Storage Facility Disinfection Procedure* for required documentation.
 - Statement whether a *Chlorine Meter* was used to measure chlorine residual concentrations used for *Disinfection*. If the concentrations were calculated, reason why it was impractical to use a *Chlorine Meter*.
 - If water was discharged to the natural environment,
 - description of handling of *Disinfection* water
 - if dechlorination was required, total chlorine residual concentration of water discharged after dechlorination, and name of chemical used for dechlorination
 - statement whether discharge met the requirements of Condition 5.5 of Schedule B of the Municipal Drinking Water Licence, including which sub-clause of Condition 5.5 was met
 - ***For Disinfection of Filters other than Cartridge Filters:***
 - Initial and final chlorine concentration results, including locations of samples.
 - Date and time *Disinfection* started and ended with calculation of retention period(s) in minutes or hours.
 - Statement that filter walls above normal operating water level were *Disinfected* by spraying all surfaces that may come in contact with water with a minimum 200 mg/L chlorine solution. For GAC and membrane filters, statement that the spraying of filter walls occurred prior to adding the GAC or membranes to the filter basins.

- When GAC is added to a filter, statement that sanitary practices were used when storing, handling, and installing the GAC.
- **For *Disinfection* of Cartridge Filters:**
 - Statement that the new or temporarily removed filter cartridge was stored, handled and installed using sanitary practices prior to placing into service.
 - Statement that filter housing was cleaned as per Section 4.1 of *AWWA C653*.
 - Statement that the *Process Water* filter housing was *Disinfected* by one of the following methods:
 - spraying all surfaces that come in contact with water with a minimum 1% chlorine solution
 - filling the filter housing with a chlorine solution, including concentration of chlorine solution and date/time *Disinfection* started and ended with calculation of retention period(s) in minutes or hours
- **For Polymer-Based Membranes:**
 - statement that membranes were stored, handled, installed, and repaired using sanitary practices
 - if deemed appropriate by the *Operating Authority*, statement that membranes were flushed
 - if required, statement that membranes underwent maintenance cleaning prior to placing into service
- **For *Disinfection* of Water Pumps:**
 - Statement that pump was cleaned or flushed.
 - Statement that the *Process Water* or *Drinking Water Pump* was *Disinfected* by one of the following methods:
 - spraying all surfaces that come in contact with water with a minimum 1% chlorine solution
 - filling the pump with a chlorine solution, including concentration of chlorine solution, dates and times *Disinfection* started and ended with calculation of retention period(s) in minutes or hours
- **For UV Units:**

- Statement that sanitary practices were maintained
 - If applicable, statement that the UV unit was *Disinfected* as per manufacturer's recommendations
- **Microbiological Sampling:**
 - date, time, and location of *Microbiological Samples*
 - *Microbiological Sample* and applicable chlorine residual concentration test results
 - if applicable, name of *Certified Operator* or *Water Quality Analyst* who took the *Microbiological Samples* and associated chlorine concentration residual tests
- **Placing into Service:**
 - Date and time of placing into service.
 - Statement that sanitary practices were maintained following *Disinfection* until the *Component* was placed into service.
 - If applicable, when a *Component* was placed into service:
 - Chlorine residual concentration test result(s)
 - Date, time and location of the test(s).
 - If no *Microbiological Samples* were taken after *Disinfection* of a water pump or a cartridge filter, name of *Certified Operator* who witnessed the *Disinfection*.
 - For a GAC filter, statement that *Microbiological Samples* were taken prior to adding the GAC.
 - If a filter was left empty more than 5 days after being *Disinfected*, statement that *Satisfactory Microbiological Sample* results were received prior to placing the filter into service.
 - If a *Process Water* filter was not placed into service within 5 days **after being filled** after *Disinfection*, statement that, prior to placing the filter into service:
 - the filter effluent turbidity was below 1.0 NTU
 - the filter contents were deemed fit to be directed to the next treatment process
 - **Exception as per Section 5.1.7 – Placing *Component* into service prior to receiving *Microbiological Sample* test results,**
 - Description of the circumstances requiring the early placing into service prior to receiving *Microbiological Sample* test results.
 - Name of *Operator-in-Charge* who verified that the cleaning and *Disinfection* of the *Component* met the requirements of this procedure.

6. Delivery

No modification to this section.

Appendix A – Definitions

In this procedure,

Appurtenance

means an appurtenance, within the meaning of [O. Reg. 170/03](#), that is in contact with water.

AWWA C653

means ANSI/AWWA Standard C653 - “Disinfection of Water Treatment Plants”, Version 2020, as updated.

Certified Operator

means certified operator within the meaning of [O. Reg. 170/03](#).

Chlorine Meter

means a calibrated electronic direct readout colourimetric or amperometric chlorine meter that has a readout that displays to at least two significant figures. Another method may be approved by the *Director*.

Component

means a part of a *Drinking Water System* that is normally in contact with *Raw Water*, *Process Water* or *Drinking Water*.

Contaminant

means foreign matter that is not intended to enter *Drinking Water*.

Contaminated/Contamination

means the presence of a *Contaminant* in *Drinking Water*.

Director

means a Director appointed pursuant to Section 6 of the [Safe Drinking Water Act \(SDWA\)](#) for the purposes of Parts V/VI of the Act.

Disinfected/Disinfection

means a process that inactivates pathogenic microorganisms on the surfaces of system *Components* in contact with water by chemical oxidants or equivalent agents. This definition does not include “primary disinfection” based on *Log Removal/Inactivation Credits*.

Drinking Water

means drinking water within the meaning of the [Safe Drinking Water Act \(SDWA\)](#).

Drinking Water System

means drinking water system within the meaning of the [Safe Drinking Water Act \(SDWA\)](#).

Isolate/Isolation

means operate valves to ensure that there is no flow of water to or from a specific section of a *Storage Facility, Component, and/or its associated Piping*.

Log Removal/Inactivation Credit

means a value assigned to a unit treatment process used to achieve “primary disinfection”, expressed in logarithmic units, for the removal or inactivation of a specific pathogen or group of pathogens, such as viruses, bacteria, and protozoa.

Microbiological Sample

means water sample taken and tested for *Escherichia coli* and Total Coliforms by a licensed and accredited laboratory.

Ministry

means Ontario’s Ministry of the Environment, Conservation and Parks.

Municipal Drinking Water Well Disinfection Procedure

means any future “Municipal Drinking Water Well Disinfection Procedure” published by the *Ministry*, as amended.

Operating Authority

means operating authority within the meaning of the [*Safe Drinking Water Act \(SDWA\)*](#).

Operator-in-Charge

means an operator-in-charge within the meaning of [*O. Reg. 128/04*](#).

Pipe/Piping

means any pipe or conduit that conveys water, inside a building or underground.

Potable Water

in AWWA C653 means *Drinking Water*.

Pressure Vessel

means an enclosed vessel containing *Raw, Process or Drinking Water* that is pressurized during normal operation.

Process Water

means water that is in the process of being treated in a water treatment plant. This means, **AFTER** the point where *Log Removal/Inactivation Credit* treatment has started, but **BEFORE** all *Log Removal/Inactivation Credit* treatment has been achieved.

Process Water Pump

means a pump that conveys *Process Water* or *Drinking Water* that is not being directed to users. Examples of such *Drinking Water* pumps are backwash pumps that convey *Treated Water*.

Raw Water

means water **BEFORE** the point where *Log Removal/Inactivation Credit* treatment starts.

Satisfactory

- as related to *Drinking Water* means, *Microbiological Sample* results that are negative for *Escherichia coli* and Total Coliforms
- as related to *Raw or Process Water*, means *Microbiological Sample* results acceptable to the *Operating Authority*

Storage Facility

means any *Tank*, reservoir, elevated tank, standpipe, or *Pressure Vessel* that contains *Raw, Process or Drinking Water*, other than filter basins.

Tank

means any clearwell and any tank (including any tank within the water treatment plant process and pressure/surge tank that is bladderless). *Tank* DOES NOT include filter basins.

Treated Water

means water inside the Water Treatment Plant **AFTER** the point where *Log Removal/Inactivation Credit* treatment has been completed.

Water Quality Analyst

means a water quality analyst within the meaning of [O. Reg. 128/04](#).

Water Storage Facility Disinfection Procedure

means any future “Water Storage Facility Disinfection Procedure” published by the *Ministry*, as amended.

Watermain Disinfection Procedure

means the *Ministry*’s “[Watermain Disinfection Procedure](#)”, dated August 1, 2020, as amended.

Appendix B – Version History

Version	Details	Date
1.0	Initial publication of the <i>Water Treatment Plant Disinfection Procedure</i>	August 27, 2026
1.1	Section 5.1.7 - Corrected wording: “Microbiological Sample results shall be uploaded to the Ministry’s database by the laboratory”.	September 23, 2026