Section 2.7. Non-Potable Water Systems

Rev. 12717 12997 13259 13736 13760

2.7.1. Connection

2.7.1.1. General

1) A non-*potable water system* shall not be connected to a *potable water system*.

2) For the purpose of this Section

a) all non-*potable water systems* shall comply with Subsections 2.7.1., 2.7.2. and 2.7.3.,

b) an *alternate water source system* installed prior to January 1, 2019 shall comply with Subsection 2.7.4., and

c) an *alternate water source system* installed on or after January 1, 2019 shall comply with Subsections 2.7.5., 2.7.6., 2.7.7., and 2.7.8.

2.7.1.2. Non-Potable Water Sources

1) Except as prohibited by Sentence (2), a non-*potable water system* shall collect only

a) *rainwater*,

b) *clear-water waste*, or

c) a combination thereof.

2) A non-*potable water system* shall not collect

a) runoff from a public road,

b) runoff from an area on which fertilizer is used or stored,

c) *groundwater*,

d) *perimeter drainage water*,

e) *greywater*, or

f) *blackwater*.

2.7.1.3. Non-Potable Water Uses

1) Except as provided in Sentences (2) and (5), a non-*potable water system* may use treated non-*potable* water for any of the uses set out in Columns A or B of Table 2.7.1.3.

2) An *alternate water source system* shall use treated non-*potable* water in lieu of *potable* water for all of the uses set out in Column A of Table 2.7.1.3.

3) Non-*potable* water shall not be used in lieu of *potable* water for any other uses.

Table 2.7.1.3.
Uses for Treated Non-*potable* Water
Forming part of Sentences 2.7.1.3.(1), (2) and (3)

Non-*potable* Water Source	Uses for Treated Non-*potable* Water	
	Column A	Column B
Rainwater	Water closets, urinals and trap primers	Irrigation of non-food purpose plants, clothes washers, vehicle wash facilities(1), make-up water for hydronic systems, make-up water for *cooling towers*, adiabatic cooling systems, and tempering of discharge.
Clear-water waste		
Groundwater	Not permitted	
Perimeter drainage water		
Greywater		
Blackwater		

Notes to Table 2.7.1.3.:
(1) See Article 2.2.11.3.

4) Where the static pressure at any *fixture* in a non-*potable water system* may exceed 550 kPa, a pressure-reducing valve shall be installed to limit the maximum static pressure at the *fixture* to 550 kPa.

5) Non-*potable water systems* shall not be used to supply *fixtures* in healthcare facilities.

2.7.2. Identification

2.7.2.1. Piping and Outlet Identification

1) Except as required by Sentence (2), all non-*potable* water pipes shall be identified and marked in accordance with CAN/CSA-B128.1, "Design and Installation of Non-Potable Water Systems."

2) All non-*potable* water distribution pipes of 2 inch in *size* and smaller shall be purple in colour and conform to the requirements of NSF-rw and NSF/ANSI 14, "Plastics Piping System Components and Related Materials."

3) Non-*potable* water outlets shall be identified by a sign or plate in a location that is conspicuously visible and constructed of a durable, weather resistant material. (See Note A-2.7.2.1.(3).)

2.7.3. Location

2.7.3.1. Pipes

1) Non-*potable* water piping shall not be located directly above

a) areas where food, drink or products that are intended for human consumption are prepared, handled, dispensed or stored, or

b) a non-pressurized or pressurized *potable* water tank.

2.7.3.2. Outlets

1) An outlet from a non-*potable water system* shall not be located where it can discharge into

a) a sink or lavatory,

b) a *fixture* into which an outlet from a *potable water system* is discharged, or

c) a *fixture* that is used for the preparation, handling or dispensing of food, drink or products that are intended for human consumption.

(See Note A-2.7.3.2.(1).)

2.7.4. Alternate Water Source Systems Installed Prior to January 1, 2019

2.7.4.1. Requirements for Alternate Water Source Systems Installed Prior to January 1, 2019

1) An *operating permit* shall be obtained, and the owner of the *alternate water source system* shall comply with the requirements of this Subsection.

2) The *operating permit* number assigned to the *alternate water source system* shall be posted on a sign or plate that is a minimum of 8.5 in by 11 in in size and securely fastened to the *alternate water source system* in a location that is conspicuously visible and constructed of a durable, weather resistant material.

3) The *Chief Building Official* shall be notified within 30 days of any changes to the information that was last provided to the *City* with regard to the *operating permit*, in the form prescribed by the *Chief Building Official*.

4) Water quality shall comply with the water quality standards, testing, documentation, and reporting requirements set out in Articles 2.7.7.1. and 2.7.7.2.

5) If a test result shows that the water quality fails to meet any of the standards set out in Table 2.7.7.1., the owner of an *alternate water source system*, or their authorized representative, shall undertake the response set out in Table 2.7.4.1.

Table 2.7.4.1.
Required Response to Failure to Meet Water Quality Standards for *Alternate Water Source Systems* Installed Prior to January 1, 2019
Forming part of Sentence 2.7.4.1.(5)

Parameter	Test Result	Required Response
E. coli(1)	100 or more CFU per 100 mL or 100 or more MPN per 100 mL	1. Immediately, supply the *alternate water source system* with *potable* water only; 2. Within 24 hours, give notice to the *Chief Building Official* and the *owner*; and 3. Within 5 days, but no less than 48 hours after any cleaning or disinfection, perform an *E. coli* test(1) and, if the water quality standard for *Legionella pneumophila* had been exceeded, a *Legionella pneumophila* culture test(1).
Legionella pneumophila(1)	10 or more CFU per mL	
Turbidity	> 15 NTU	
Temperature	> 25°C	

Notes to Table 2.7.4.1.:
(1) See Article 2.2.1.7.

6) The *alternate water source system* shall be maintained in accordance with any manufacturer's specifications.

7) If the *alternate water source system* is in use, cross connection control tests shall be performed as required by CAN/CSA-B128.1, "Design and Installation of Non-Potable Water Systems."

8) A maintenance log shall be maintained in accordance with Sentence 2.7.8.2.(3).

9) An *alternate water source system* commissioned after January 1, 2019 shall comply with the requirements of Article 2.7.5.2.

2.7.4.2. No Other Requirements

1) *Alternate water source systems* installed prior to January 1, 2019 need not comply with any other requirements set out in Subsections 2.7.5. through 2.7.8.

2.7.5. Alternate Water Source Systems

2.7.5.1. Occupancy

1) Before *occupancy* of a *building* is permitted, an *alternate water source system* shall be commissioned within 8 weeks of *occupancy* in accordance with Article 2.7.5.2., and an *operating permit* shall be obtained in accordance with Article 2.7.5.3.

2) After an *alternate water source system* has been commissioned, the requirements of Subsections 2.7.7. and 2.7.8. shall be met.

3) An *alternate water source system* shall be considered commissioned on the date that the final water sample was collected to fulfill the requirements of Article 2.7.5.2.

2.7.5.2 Commissioning

1) In order to commission an *alternate water source system*

a) the treated non-*potable* water shall be tested for *E. coli*, turbidity and *Legionella pneumophila*,
   i) in accordance with Article 2.2.1.7.,
   ii) on water samples collected from the sampling port required by Article 2.7.6.6.,
   iii) weekly for a period of 4 weeks for *E. coli* and turbidity, and
   iv) once for *Legionella pneumophila*,
b) test results shall be provided to the *Chief Building Official*, and
c) a cross connection control test shall be performed as required by CAN/CSA-B128.1, "Design and Installation of Non-Potable Water Systems" and witnessed by the *Chief Building Official*.

2) Except as required by Sentence (3), if a water sample required by this Article fails to meet any of the standards set out in Table 2.7.7.1., an additional water sample for *E. coli* shall be collected no less than 48 hours and not more than 5 days after any cleaning or disinfection, tested, and reported.

3) If a *Legionella pneumophila* sample required by this Article fails to meet the standard set out in Table 2.7.7.1., an additional water sample for *Legionella pneumophila* and *E. coli* shall be collected no less than 48 hours and not more than 5 days after any cleaning or disinfection, tested, and reported.

2.7.5.3. Operating Permit

1) An *operating permit* shall be obtained, and the owner of the *alternate water source system* shall comply with the requirements of this Subsection.

2) The *operating permit* number assigned to the *alternate water source system* shall be posted on a sign or plate that is a minimum of 8.5 in by 11 in in size and securely fastened to the *alternate water source system* in a location that is conspicuously visible and constructed of a durable, weather resistant material.

3) The *Chief Building Official* shall be notified within 30 days of any changes to the information that was last provided to the *City* with regard to the *operating permit*, in the form prescribed by the *Chief Building Official*.

2.7.5.4. Continued Operation

1) Once an *operating permit* has been issued, an *alternate water source system* shall operate continuously unless written approval to discontinue its use has been obtained from the *Chief Building Official* or *City Engineer*.

2.7.6. Design

2.7.6.1. Professional Design

1) An *alternate water source system* shall be designed by a *registered professional* and shall be designed to prioritize the use of non-*potable* water.

2.7.6.2. Pipe Sizing

1) Except as required by Sentence (2), non-*potable* distribution piping shall be sized according to Subsection 2.6.3.

2) *Dwelling units* within a *building* with an *alternate water source system* shall be equipped with

a) tank type water closets, and

b) non-*potable* distribution piping sized in conformance with the IAPMO Water Demand Calculator.

2.7.6.3. Continuity of Supply and Backflow Prevention

1) A secondary water supply shall be provided.

2) Where a non-*potable water system* is supplied by a *potable water system*, the *potable water system* shall be protected in accordance with Article 2.6.2.1.

2.7.6.4. Cisterns

(See Article 2.4.2.2. and Note A-2.7.6.4., 2.7.6.5. and 2.7.6.6.)

1) Provision shall be made upstream of the *cistern* to remove the accumulation of particulates and impurities before they enter the *cistern*.

2) *Cisterns* shall be secured to prevent tampering and unintended or unauthorized entry either by a lockable device or another *approved* method, and all penetrations shall be sealed to prevent insect or vermin entry.

3) Water shall be withdrawn a minimum of 0.3 m from the base of the *cistern*.

2.7.6.5. Water Metering

(See Note A-2.7.6.4., 2.7.6.5. and 2.7.6.6.)

1) A water meter shall be installed and located within 1.5 m of the *potable* water make-up supply and shall be capable of recording the volume of *potable* water being supplied.

2) A water meter shall be installed and located on the non-*potable* water outlet prior to distribution and shall be capable of recording the volume of non-*potable* water being supplied to the distribution piping.

3) Water meters required by Sentences (1) and (2) shall be capable of displaying volumes in units of L or cubic m.

2.7.6.6. Water Quality Sampling and Alerts

(See Article 2.2.1.7. and Note A-2.7.6.4., 2.7.6.5. and 2.7.6.6.)

1) A sampling port, and provision for continuous in-line measurements required in order to conform with Table 2.7.7.1., shall be installed and located downstream of the water meter at the non-*potable* water outlet and prior to distribution.

2) All monitoring devices referred to in Sentence (1) above shall be capable of activating an *alert* that is designed to activate continuously for the duration of the *alert* condition whenever the water quality fails to meet the standards set out in Table 2.7.7.1.

2.7.6.7. Power Interruption

1) If a *building* is required to have an emergency system generator, provision shall be made for the continued operation of any mandatory uses for non-*potable* water described in Sentence 2.7.1.3.(2) in the event of a power interruption.

2.7.7. Water Quality Standards

2.7.7.1. Water Quality Standards, Testing, and Documentation

1) Water quality shall meet the standards set out in Table 2.7.7.1.

2) Water quality shall be tested as set out in Table 2.7.7.1.

3) All test results shall be documented as set out in Table 2.7.7.1., and documentation shall be retained for no less than 24 months.

Table 2.7.7.1.
Water Quality Standards, Testing, and Documentation
Forming part of Sentences 2.7.7.1.(1), (2), and (3)

Applicability	Parameter	Standard	Testing Type and Frequency	Testing Result Documentation Requirement
Any non-*potable* water source	Temperature	< 20°C	Continuous	Daily(1)
	Turbidity	< 10 NTU	Daily(1), and 1 sample tested by a laboratory every 2 calendar months with not more than 63 days between samples	Daily(1), plus all laboratory tests
	E. coli(2)	< 100 CFU per 100 mL or < 100 MPN per 100 mL	1 sample tested every 2 calendar months with not more than 63 days between samples	All laboratory tests
	Legionella pneumophila(2)	< 10 CFU per mL	1 sample tested every 2 calendar months with not more than 63 days between samples	All laboratory tests
Rainwater from surfaces that allow the passage of vehicular traffic or where hydrocarbon-based fuels or hazardous materials are stored	Benzene	< 0.005 mg/L	1 sample tested every 2 calendar months with not more than 63 days between samples	All laboratory tests
	Toluene	< 0.024 mg/L		
	Ethylbenzene	< 0.0016 mg/L		
	Xylenes (total)	< 0.02 mg/L		
	Total suspended solids	< 20 mg/L		

Notes to Table 2.7.7.1.:
(1) For the purpose of this Table, the term “daily” shall mean once per day when the *building* is normally occupied.
(2) See Article 2.2.1.7.

2.7.7.2. Water Quality Reporting

1) Water quality reports shall be submitted by the owner of an *alternate water source system*, or their authorized representative, to the *Chief Building Official* before the end of the second month following the issuance of an *operating permit*, and then every 2 calendar months thereafter, and shall include

a) all documentation required by Sentence 2.7.7.1.(3) and

b) except as provided in Sentence 2.7.4.2.(1), readings from the water meters required by Article 2.7.6.5.

2.7.7.3. Required Response to Failure to Meet Water Quality Standards

1) If a test result shows that the water quality fails to meet a standard set out in Table 2.7.7.1., the owner of an *alternate water source system*, or their authorized representative, shall undertake the response set out in Table 2.7.7.3.

Table 2.7.7.3.
Required Response to Failure to Meet Water Quality Standards for *Alternate Water Source Systems*
Forming part of Sentence 2.7.7.3.(1)

Parameter	Test Result	Required Response
Turbidity	Between 10 and 15 NTU	Take the appropriate corrective action as set out in the operating manual.
Temperature	20°C to 25°C	
Total suspended solids	Between 20 and 45 mg/L	
E. coli(1)	100 or more CFU per 100 mL or 100 or more MPN per 100 mL	1. Immediately, supply the *alternate water source system* with *potable* water only; 2. Within 24 hours, give notice to the *Chief Building Official* and the *owner*; 3. Take the appropriate corrective action as set out in the operating manual; and 4. Within 5 days, but no less than 48 hours after any cleaning or disinfection, perform an *E. coli* test(1) and, if the water quality standard for *Legionella pneumophila* had been exceeded, a *Legionella pneumophila* culture test(1).
Legionella pneumophila(1)	10 or more CFU per mL	
Turbidity	> 15 NTU	
Temperature	> 25°C	
Benzene	> 0.005 mg/L	1. Immediately, supply the *alternate water source system* with *potable* water only; 2. Within 24 hours, give notice to the *Chief Building Official* and the *owner*; 3. Take the appropriate corrective action as set out in the operating manual; and 4. Within 3 days of the corrective action, perform a test for benzene, toluene, ethylbenzene and xylenes (total).
Toluene	> 0.024 mg/L	
Ethylbenzene	> 0.0016 mg/L	
Xylenes (total)	> 0.02 mg/L	
Total suspended solids	> 45 mg/L	1. Immediately, supply the *alternate water source system* with *potable* water only; 2. Within 24 hours, give notice to the *Chief Building Official* and the *owner*; 3. Take the appropriate corrective action as set out in the operating manual; and 4. Within 3 days of the corrective action, perform a test for total suspended solids.

Notes to Table 2.7.7.3.:
(1) See Article 2.2.1.7.

2.7.8. Operating Manual and Maintenance

2.7.8.1. Operating Manual

1) An operating manual conforming to Article 2.2.1.9. is required for an *alternate water source system*, and shall be sealed by a *registered professional of record*.

2.7.8.2. Maintenance

1) *Alternate water source systems* shall be maintained in accordance with the operating manual and any manufacturer's specifications.

2) Cross connection control tests shall be performed as required by CAN/CSA-B128.1, "Design and Installation of Non-Potable Water Systems."

3) A maintenance log conforming to Article 2.2.1.8. shall be maintained, and shall also include

a) the documentation required by Sentence 2.7.7.1.(3), and

b) if a water quality test fails to meet a standard defined in Table 2.7.7.1., a description of the extent of the deviation from the standard, the corrective action taken, a record of any required notification, and the outcome of the corrective action, including all applicable dates and times.