

Model Cross-Connection Control Program

(last revised July 22, 2022)

I. Purpose

Cross-Connections between water supplies and non-potable sources of contamination are significant threats to health in the water supply industry. This ordinance is designed to maintain the safety and potability of the water in the _____ Public Water System by establishing rules and procedures to prevent the contamination of public drinking water by the backflow of water or other fluids.

A. The purpose of this regulation is:

1. To protect the public water supply of the _____ Public Water System from the possibility of contamination by isolating contaminants which could backflow or back-siphon into the public water system within its customers' internal distribution system(s);
2. To promote the elimination or control of cross-connections, actual or potential, between its customers' in-plant drinking water system(s) and anything that could contaminate or pollute it; and
3. To provide for the maintenance of a cross-connection control program to effectively prevent the contamination or pollution of all drinking water systems.

This document is intended to supplement the rules listed in section II below. Changes to this document in the future must be approved by the New Hampshire Department of Environmental Services (NHDES).

II. Authority

- A. New Hampshire Administrative Rule Env-Dw 505, or subsequent rules, *Backflow Prevention*.
- B. The _____ Public Water System rules and regulations, adopted.

III. Requirements

The water superintendent shall be responsible for the protection of the public potable water distribution system from contamination or pollution due to the backflow or back-siphonage of contaminants or pollution through the water service connection. If, in the judgment of the water superintendent, an approved backflow prevention device is required at the _____'s water service connection to any customer's premises for the safety of the water system, the water superintendent or his designated agent shall give notice, in writing, to said customer to install an approved backflow prevention device at each service connection to his premises. The customer shall,

within 90 days, install approved device or devices at his own expense. Failure, refusal, or inability on the part of the customer to install said device or devices within 90 days shall constitute grounds for discontinuing water service to the premises until such device or devices have been properly installed.

IV. Definitions

- A.** Approved Backflow Prevention Device – A backflow prevention device that has been:
 - 1.** Manufactured to allow for accurate testing and inspection so as to allow verification of performance; and
 - 2.** Tested and approved by the University of Southern California, Foundation for Cross-Connection Control and Hydraulic Research.
- B.** Auxiliary Water Supply – Any water supply on or available to the premises other than the purveyor’s approved public potable water supply.
- C.** Backflow – The flow of water or other fluids, mixtures or substances into the distribution pipes of a potable water system from any source other than the intended approved source of supply.
- D.** Backflow Preventer – A device or means designed to prevent backflow or back-siphonage.
 - 1.** Air Gap – A physical separation sufficient to prevent backflow between the free-flowing discharge end of the potable water system and any other system. Physically defined as a vertical distance equal to twice the diameter of the supply pipe but not less than one inch.
 - 2.** Atmospheric Vacuum Breaker – A device which prevents back-siphonage by creating an atmospheric vent when there is either a negative pressure or sub-atmospheric pressure in a water system.
 - 3.** Barometric Loop – A fabricated piping arrangement rising at least 35 feet at its topmost point above the highest fixture it supplies. It is utilized in water systems to protect against back-siphonage.
 - 4.** Double Check Valve Assembly – An assembly of two independently operating spring loaded check valves with tightly closing shut-off valves on each side of the double check valve, plus properly located test cocks for the testing of each check valve.
 - 5.** Dual Check Valve with Intermediate Atmospheric Vent – A device having two independently operating spring loaded check valves separated by an atmospheric vent chamber.

- 6.** Hose Bib Vacuum Breaker – A device which is connected to a hose bib and which acts as an atmospheric vacuum breaker. Not to be used under constant pressure.
 - 7.** Pressure Vacuum Breaker – A device containing one or two independently operated spring loaded check valves and an independently operated spring loaded air inlet valve located on the discharge side of the check valve(s). The device includes tightly closing shut-off valves on each side of the check valve(s) and properly located test cocks for the testing of the assembly.
 - 8.** Reduced Pressure Principle Backflow Preventer – An assembly consisting of two independently operating spring loaded check valves with an automatically operating differential relief valve located between the two check valves, tightly closing shut-off valves on each side of the check valves plus properly located test cocks for the testing of the check valves and the relief valve.
 - 9.** Residential Dual Check – An assembly of two spring loaded independently operating check valves. Generally employed immediately downstream of the water meter to act as a containment device in a single or two family residence.
- E.** Backpressure – A condition in which the owner’s system pressure is greater than the supplier’s system pressure.
- F.** Back-Siphonage – The flow of water or other fluids, mixtures or substances into the distribution pipes of a potable water system from any source other than its intended source caused by the sudden reduction of pressure in the public water system.
- G.** Containment – A method of backflow prevention which requires a backflow prevention device at the water service entrance.
- H.** Contaminant – A substance that may impair the quality of the water creating a potential health hazard to the public.
- I.** Cross-Connection – Any actual or potential connection between the public water system and any source of contamination or unapproved water source.
- J.** Fixture Isolation – A method of backflow prevention in which a backflow preventer, such as a hose bib or an atmospheric vacuum breaker, is located to correct a cross-connection at an in-plant location rather than at a water service entrance. This protects the drinking water in the building.
- K.** Owner – Any person who has legal title to, or license to operate or inhabit in, a property upon which a cross-connection inspection is to be made or upon which a cross-connection may be present.

- L. Person – Any individual, partnership, company, public or private corporation, political subdivision or agency of the state, department, agency or instrumentality of the United States, or any other legal entity.
- M. Water Service Entrance – That point in the owner’s water system beyond the sanitary control of the water supplier; generally considered to be the outlet end of the water meter or where the water service first enters the building.
- N. Water Superintendent – The official, or his delegated representative, in charge of the Public Water System who is invested with the authority and responsibility for the implementation of an effective cross-connection control program and for the enforcement of the provisions of this ordinance.
- O. Water Supplier – The public water supply system.

V. Administration

- A. The Public Water System will operate an approved cross-connection control ordinance, including the keeping of necessary records to fulfill the requirements of NHDES’s Backflow Rules, Regulations, and related laws.
- B. The owner shall allow the Public Water System to inspect his property for possible cross-connections and shall follow the provisions of the Public Water System’s ordinance and their rules.
- C. If the Public Water System requires that the public supply be protected by containment, the owner shall be responsible for the water quality beyond the outlet end of the containment device and should utilize the appropriate device approved for that purpose.

VI. Responsibilities

A. Public Water System

1. On new installations, the Public Water System will provide an on-site evaluation and/or inspection and review of plans in order to determine the type of backflow preventer, if any, that will be required.
2. On new installations, the Public Water System will issue a permit and perform inspection and testing.
3. For premises existing prior to the start of this program, the Public Water System will:

- a. Perform an assessment of the function of the premise and determine if it poses a cross-connection risk. If a risk is present, assess the risk as high hazard or low hazard.
 - b. Inform the owner in writing of any corrective action deemed necessary, the method of achieving the correction, and the time allowed for the correction to be made. Ordinarily, 30 days will be allowed. However, this time period may be shortened depending upon the degree of hazard involved and the history of the device(s) in question.
4. The _____ Public Water System will not allow any cross-connection to remain unless it is isolated by an approved backflow prevention assembly, commensurate with the degree of hazard, for which a permit has been issued and which will be regularly inspected/tested to ensure satisfactory operation.
5. The _____ Public Water System shall inform the owner in writing of any failure to comply and the time allowed for the correction to be made. If upon re-inspection the owner has not complied, the _____ Public Water System may allow an additional 15 days for the correction. In the event the owner fails to comply with the necessary correction by the time of the second re-inspection, the _____ Public Water System will inform the owner, by certified letter, that the water service to the owner's premises will be terminated within a period not to exceed five days. In the event that the owner informs the _____ Public Water System of extenuating circumstances as to why the correction has not been made, a time extension may be granted by the _____ Public Water System.
6. If the _____ Public Water System determines at any time that a serious threat to the public health exists, the water service shall be terminated immediately.
7. The _____ Public Water System shall begin inspections to determine the nature of existing hazards and corrections to be made, following approval of the program by NHDES. Initial focus will be on high hazard water use.
8. Certified backflow prevention device inspectors must be certified through the NEWWA Certified Backflow Prevention Device Inspectors/Testers Program.
9. The _____ Public Water System shall also develop installation standards and specifications for each type of backflow preventer to ensure they are installed in a manner in which they have been evaluated and approved and to allow for periodic testing and maintenance.

B. Owner

1. The owner shall be responsible for the elimination or isolation with the proper installation of an approved backflow prevention device commensurate with the degree of hazard, for all cross-connections on his premises.
2. The owner, after having been informed by a letter from the _____ Public Water System, shall, at his expense, install, maintain, and inspect or have inspected (as determined by the _____ Public Water System), all backflow preventers on his premises.
3. The owner shall correct any deficiency of a backflow preventer which is revealed by inspection or testing. This shall include the replacement of parts or the replacement of the backflow preventer, if deemed necessary by the _____ Public Water System.
4. The owner shall inform the _____ Public Water System of any proposed or modified cross-connections and also existing cross-connections of which the owner is aware but has not been found by the _____ Public Water System.
5. The owner shall not install a by-pass around any backflow preventer unless there is a backflow preventer of the same type on the by-pass. Owners who cannot shut down operations for inspecting of the device(s) must supply additional devices necessary to allow inspecting to take place.
6. The owner shall install backflow preventers in a manner and location approved by the _____ Public Water System.
7. The owner shall only install an “approved backflow prevention device.”
8. Any owner having a private well or other private water source must:
 - a. Have a permit if the well or source is cross-connected to the _____ Public Water System’s system. Permission to cross-connect may be denied by the _____ Public Water System. The owner may be required to install a backflow preventer at the service entrance if a private water source is maintained, even if it is not cross-connected to the _____ Public Water System’s system.
 - b. In the event the owner installs plumbing to provide drinking water for domestic purposes which is on the _____ Public Water System’s side of the backflow preventer, such plumbing must have its own backflow preventer installed.
9. The owner shall be responsible for the payment of all fees for permits, annual or semi-annual device inspections, re-testing in the case that the device fails to operate

correctly, and re-inspections for non-compliance with the Water System or NHDES requirements.

Public

VII. Degree of Hazard

The Public Water System recognizes the threat to the public water system arising from cross-connections. All threats will be classified by degree of hazard and will require the installation of approved backflow prevention devices for high and low hazards.

A. Low Degree of Hazard

If backflow were to occur, the resulting effect on the water supply would be a change in its aesthetic qualities. The foreign substance must be non-toxic to humans.

B. High Degree of Hazard

If backflow were to occur, the resulting effect on the water supply could cause illness or death if consumed by humans. The foreign substance may be toxic to humans from either a chemical, bacteriological or radiological standpoint. The effects of the contaminants may result from short- or long-term exposure.

Only the following types of backflow prevention devices may be used for the containment of on-site contaminants for high and low hazard situations respectively:

C. High Hazard:

1. Air gap (AG)
2. Reduced pressure principal backflow preventer (RPZ)
3. Combination of the above

D. Low Hazard:

1. Air gap (AG)
2. Pressure vacuum breaker (PVB)
3. Double check valve assembly (DCVA)
4. Reduced pressure principal backflow preventer (RPZ)
5. Combination of the above

VIII. Permits

The Public Water System shall not permit a cross-connection within the public water system unless it is considered necessary and cannot be eliminated.

- A. Cross-connection permits that are required for each backflow prevention device are obtained from the _____ Public Water System. A fee of X dollars will be charged for the initial permit and X dollars for the renewal of each permit.
- B. Cross-connection permits shall be renewed every five years and are non-transferable. Permits are subject to revocation and become immediately revoked if the owner should so change the type of cross-connection or degree of hazard associated with the service type of device, replacement of device with a new device, or change of ownership.
- C. A permit is not required when containment for a connection evaluated as neither a low nor high-degree of hazard is achieved with the utilization of residential dual checks.

IX. Existing in-use Backflow Devices

Any existing backflow preventer shall be allowed by the _____ Public Water System to continue in service unless the degree of hazard is such as to supercede the effectiveness of the present backflow preventer, or unless an unreasonable risk to the public health results.

X. Periodic Testing

- A. Backflow prevention devices shall be inspected and tested at least semi-annually for high hazard devices and annually for low hazard devices.
- B. Periodic inspections and testing shall be performed by an inspector certified through the NEWWA Backflow Prevention Device Inspectors/Testers Program. The inspections will be done at the owner's expense.
- C. When performed by an inspector from the _____ Public Water System, the inspections shall be conducted during the _____ Public Water System's regular business hours. Exceptions to this, when at the request of the owner, may require additional charges to cover the increased costs to the _____ Public Water System.
- D. Any backflow preventer which fails the inspection test during a periodic inspection will be repaired or replaced. When repairs are necessary, upon completion of the repair the device will be inspected a second time at the owner's expense to ensure correct operation. High hazard situations will not be allowed to continue unprotected, if the backflow preventer fails the inspection and cannot be repaired immediately. In other situations, a compliance date of not more than 30 days after the inspection date will be established. The owner is responsible for spare parts, repair tools, and/or a replacement device. Parallel installation of two devices is an effective means of the owner ensuring that uninterrupted water service is provided during inspections or repair of devices and is strongly recommended when the owner desires such continuity.
- E. These devices shall be repaired or replaced at the expense of the owner whenever said devices are found to be defective. Tests and repairs shall be recorded on forms

approved by the water superintendent, and copies shall be distributed to the owner and water superintendent within X days of the actual test.

- F. Backflow prevention devices may be inspected more frequently than specified in section A above; in cases where there is a history of test failures and the Public Water System feels that due to the degree of hazard involved, additional inspections are warranted. Cost of the additional inspections will be borne by the owner.

XI. Records and Reports

- A. **Records** – The Public Water System will initiate and maintain the following for a minimum of five years:

1. Master files on customer cross-connection inspections and/or tests.
2. Master files on cross-connection permits.
3. Copies of permits and permit applications.

- B. **Reports** – Each year, by April 1, the Public Water System will submit an inspection report to NHDES which describes testing conducted during the previous calendar year and including the following:

(1) The total number of permitted cross connections that existed at the water system at the end of the year for which the report is being filed; and

(2) The following information for each backflow prevention device:

- a. The permit number of the backflow prevention device;
- b. The name of the owner of the backflow prevention device;
- c. The location of the backflow prevention device;
- d. The date of each inspection and test performed during the year of reporting;
- e. The name, certifying organization, and certification number of the certified backflow prevention device inspector who performed the inspection and test on the device;
- f. The result of each inspection and test; and
- g. If the inspection or test result is unsatisfactory, the date at which the backflow prevention device was found to be satisfactory following a subsequent inspection and test in that calendar year period.

XII. Fees and Charges

The Public Water System will publish a list of fees or charges for the following:

- A. **Fees**
1. Inspection fees

2. Fees for re-inspections
 3. Fees for testing
 4. Fees for Backflow Preventer permits and renewal of permits
- B. Charges**
1. Charges for after hours inspections

Addendum

(The following section may be adopted at the option of the water supply owner)

I. Residential Dual Check

- A.** Effective the date of acceptance of this Cross-Connection Control Ordinance for the _____, all new residential buildings will be required to install a residential dual check valve device immediately downstream of the water meter. Installation of this residential dual check valve device on a retrofit basis on existing service lines will be instituted at a time and at a potential cost to the homeowner as deemed necessary by the _____ Public Water System.
- B.** The owner should be aware that installation of a residential dual check valve results in a closed plumbing system with the residence. As such, provisions may have to be made by the owner to provide for thermal expansion within the closed loop system, i.e., the installation of thermal expansion tanks and/or pressure relief valves.

II. Strainers

- A.** The _____ Public Water System strongly recommends that all new retrofit installations of reduced pressure principle devices and double check valve backflow preventers include the installation of strainers located immediately upstream of the device to prevent fouling of backflow devices due to unforeseen circumstances occurring to the water system such as water main repairs, water main breaks, fires, periodic cleaning and flushing of mains, etc. These occurrences may 'stir up' debris within the water main that will cause fouling of backflow devices installed without the benefit of strainers.