



# BANGOR WATER DISTRICT

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## Cross Connection Prevention Program

### **I. PURPOSE**

Cross-connections between water supplies and non-potable sources of contamination represent one of the most significant threats to health in the water supply industry. This program is therefore designed to maintain the safety and potability of the water in the District's system by preventing the introduction of any foreign liquids, gases, and other substances, other than water from the intended sources, to provide protection from actual or potential cross-connections.

### **II. AUTHORITY**

This program derives its authority from 10-144A MRSA Chapter 226 as authorized by 22 MRSA Chapter 601, Subchapter II ss 2612 (5) and from the State of Maine internal plumbing code.

### **III. DEFINITIONS**

A. Antifreeze compounds: Any liquid, chemical or other material used as an antifreeze or heat-exchange medium. Use of antifreeze compounds is limited to propylene glycol and food-safe glycerin; ethylene glycol (automobile antifreeze) is prohibited.

B. Backflow: The flow of water or other foreign liquids, gases, or other substances or materials of any kind in any form into the distribution system of a public water supply from any source other than the intended.

C. Backflow preventer: A device to prevent backflow.

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.

2. Atmospheric Vacuum Breaker: A device which prevents back-siphonage by creating an atmospheric vent where there is either a negative pressure or sub-atmospheric pressure in a water system.

3. Backflow Preventer with Intermediate Atmospheric Vent: A device having two check valves separated by an atmospheric vent.

4. Double Check Valve: A device having two independently acting, approved check valves that are internally loaded with two resilient seated shut-off valves and test cocks for periodic testing. Referred to as a "testable" device by the District; requires permitting by the Department.

5. Dual check valve: A device having two independently acting, approved check valves. Used primarily in residential and low hazard non-residential situations. Referred to as a "non-testable" device by the District; does not require permitting by the Department.

6. Hose Bib Vacuum Breaker: A device which is permanently attached to a hose bib and which acts as an atmospheric breaker.

7. Pressure Vacuum Breaker: A device containing a spring-loaded check valve and a spring-loaded atmospheric vent which opens when pressure approaches atmospheric. It contains valves and fittings which allow the device to be tested.

8. Reduced Pressure Zone Backflow Preventer (RPZ): An assembly of check valves and a reduced pressure zone which spills water to the atmosphere in the event of the failure of the check valves. It has valves and fittings which allow the device to be tested, and is referred to as a "testable" device by the District. It requires permitting by the Department.

9. Approved device: A backflow prevention device as approved by the Dept. of Human Services, Division of Health Engineering.

D. Back-siphonage: Backflow resulting from negative or less than atmospheric pressure in the water system.

E. Back-pressure: A condition in which the customer's system pressure is greater than the supplier's system pressure.

F. Containment: A method of backflow prevention which requires a backflow preventer (containment device) at the water service entrance.

G. Containment device: An approved backflow assembly that may include a strainer as recommended by the manufacturer.

H. Contaminant: Any chemical, biological, or radiological substance or matter which is an impairment of the water quality which creates an actual hazard to the public health through poisoning or through the spread of disease by sewage, industrial fluids, or waste.

I. Cross-Connection: A cross-connection is any connection or arrangement, physical or otherwise, between a potable water supply system and any plumbing fixture, tank, or any receptacle, through which it may be possible for non-potable, used, unclean, polluted, contaminated water, and/or other substances to enter into any part of such potable water system under any condition. It is not necessary for contamination or backflow to have actually occurred. A cross-connection is simply the connection through which it may be possible for backflow or contamination to occur.

J. Cross-connection Survey: An inspection conducted by the District in order to identify any actual or potential cross-connections, to determine the degree of hazard or potential hazard and appropriate means of backflow prevention, or to confirm compliance with the District's Cross-Connection Program.

K. Customer: A person, firm, corporation, or governmental division which has applied for and been granted service, and is responsible for payment of the service.

L. Department: Maine Department of Health and Human Services

M. District: Bangor Water District

N. Domestic service: A water line which supplies potable water for non-fire protection uses such as drinking, bathing, culinary, heating, and process water purposes.

O. Fire service: A water line which supplies water for fire protection to a fire sprinkler or life safety system.

P. Fixture isolation: A method of backflow prevention in which a backflow preventer is located to correct a cross-connection in any in-plant unit rather than at the water service entrance. Fixture isolation alone is not deemed an acceptable method of backflow prevention by the District within its distribution system.

Q. Industrial Fluids: Any fluid or solution which may be chemically, biologically or otherwise contaminated or polluted in a form or concentration such as would constitute a health, system, polluttional, or plumbing hazard if introduced into the water supply. This may include but is not limited to

- \* polluted or contaminated used waters
- \* all types of process waters and "used waters" originating from public potable water systems which may deteriorate in sanitary quality
- \* chemicals in fluid form
- \* plating acids and alkalies
- \* circulated cooling waters connected to an open cooling tower
- \* cooling waters that are chemically or biologically treated or stabilized
- \* contaminated natural waters such as from wells, springs, streams, rivers, etc. or from irrigation systems or canals
- \* oils, gases, glycerine, paraffines, caustic, and acid solutions or other liquid/gaseous fluids used in industrial or other processes
- \* solutions used for fire fighting purposes or systems

R. Owner: One in whom the legal title to real estate is vested, or who is recognized and held responsible by law as the Owner of real property.

S. Permit: A document issued by the Department with the approval of the District which requires the use of a specified backflow preventer based on degree of hazard. A cross-connection permit application (HHE-616) must be completed by the District and submitted to the Department.

T. Person: Any individual or entity including, without limitation, a partnership, company, public or private corporation, association, political subdivision or agency of the State, Department, Agency, or instrumentality of the United States.

U. Plumbing System: All potable water supply and distribution pipes, all plumbing fixtures and traps, all drainage and vent pipes, and all building drains, including their respective joints and connections, devices, receptacles and appurtenances within the property lines of the

premises and shall include potable water piping, potable water treating or using equipment, and water heaters.

V. Seasonal Meter Set: A meter which is set for a limited amount of time (such as for the summer) for a specific purpose (such as a swimming pool or fountain).

W. Water Service Entrance: That point in the Customer's water system beyond the sanitary control of the District. This will normally be the outlet end of the meter and will always be before any unprotected branch.

#### **IV. SCOPE**

It is the intent of the District that all domestic water services--both new and existing--will be equipped to prevent potential backflow or backsiphonage through the "containment" approach. This requires the installation of an approved backflow prevention device at the water meter by the customer at the customer's expense. Fixture isolation alone is not deemed an acceptable method of backflow prevention by the District within its distribution system. Installation of an approved backflow device is a condition of domestic service with the District.

The District recognizes that the containment approach protects only the water source, and does not provide protection for personnel or fixtures(s) within the structure.

Fire sprinkler and life safety systems are addressed under the "Miscellaneous" section of this program.

#### **V. ADMINISTRATION**

A. As required by the State of Maine, the District will operate a cross-connection prevention program, including keeping necessary records, which fulfills the requirements of the Department's Cross-Connections Rules and which is approved by the Department. Modifications to the program may be made from time to time at the District's discretion and submitted to the Department for approval.

B. An employee of the District or its agent, having properly identified himself, will have free access at reasonable hours to all premises supplied with District water to conduct a cross-connection survey to determine backflow prevention needs and whether the needs have been met by the Customer. Access to the property for a cross-connection survey is a condition of service with the District. The District will determine the appropriate means of backflow prevention based on its approved program, and the Customer will comply with the District's recommendations.

C. The District generally refers to dual check backflow prevention devices as "residential" or "non-testable" although it recognizes the devices may be installed in non-residential structures and can be tested. The District generally refers to double check and reduced pressure zone backflow prevention devices as "testable" because testing is required at least annually, and recognizes that the devices may be installed in residential structures.

D. If the District determines at any time that an imminent threat to public health exists, service will be terminated immediately and without written warning.

E. Re-establishment of service before the installation of a backflow preventer may be allowed by the District after an agreement has been signed between the District and the Customer indicating the intention of the Customer to comply with the provisions of the agreement.

F. The District is not responsible for any cross-connections beyond the meter.

G. The District will ensure that all domestic services comply with the Cross-Connection Program. A copy of the plumbing system's plan, survey, specifications and/or drawings may be required from a customer.

## **VI. DISTRICT RESPONSIBILITY**

A. The District will maintain a copy of its current approved Cross-Connection Prevention Program, and will make it available to customers on request.

### **B. Installation and Inspection**

1. The District or its agent will perform inspections for actual or potential cross-connections. These inspections will be made during normal working hours unless--at the discretion of the District--other arrangements are necessary.

2. The District or its agent will, after the inspection of premises and/or review of plans, or third party inspection reports, notify the Customer by letter of any necessary correction, the method of making the correction, the time allowed for correction, and any additional customer responsibility such as required testing.

3. The recommendation will be based on the hazards observed during the inspection and the current use of the building. An upgrade in backflow prevention to a higher hazard device may be required should new information be received or observed during inspection, or a change in use occur. A downgrade in backflow prevention must be approved by the District.

4. The customer will contact the District as required by notice. The District will inspect the installation when completed, and recommend corrections if required.

5. The District will allow a maximum of 30 calendar days from the initial written notification for installation or correction unless the customer can demonstrate good cause for a time extension to the District's satisfaction (see Sec 6E).

### **C. Testing**

The District recognizes that any backflow preventer can fail and any method of protection can be subverted; thus, periodic testing and inspection is necessary. This includes air gap protection.

1. Dual check devices will be checked by the District at no charge following installation and when a water meter is changed.

2. The District or its agent will perform the initial test following installation on testable backflow devices at no charge, and will submit required paperwork to the Department for a permit.

3. The Customer is responsible for testing of testable devices which is to be not less than once every 12 months unless otherwise specified. The District will determine the interval between tests, and will so state on the permit application. The District will maintain a schedule of when tests are due, and will notify customers in writing not less than once a year that a test is required by a specified deadline.

The customer will be notified at least six months in advance of the deadline. Test results including the tester's name and certification number are to be reported in writing to the District on forms provided. Incorrect or incomplete forms will be returned, and a retest may be required.

4. Regarding backflow preventers which fail during testing, the District requires that repair parts be ordered within 24 hours and that shipment be by the fastest means possible. Furthermore, any extended delay (more than seven {7} days) may require discontinuance of service or other means to ensure protection of the public water system. Certain Class III degree of hazard situations which, in the District's determination pose a threat to public safety, will not be allowed to continue unprotected if the backflow preventer fails the test and cannot be immediately repaired. The District does not perform repairs on backflow preventers; the Customer is responsible for the provision of spare parts and should have a supply on hand.

5. Failure to comply with any of the testing requirements is grounds for discontinuance of service.

6. The District reserves the right to perform periodic testing, or observe testing as performed by any certified individual. The District does not perform annual backflow preventer tests while the services of a certified tester are available locally.

7. The District recognizes backflow preventer testers who have successfully completed a training course recognized by New England Water Works Association or American Backflow Prevention Association.

#### D. Disconnection

1. The District will issue an initial notice to the Customer\_by letter of any failure to comply with the provisions--including installation, permitting, testing, and maintenance--in this program, and will allow 30 calendar days for compliance unless another deadline is specified.

2. If the customers fails to comply, the District will commence disconnection proceedings in the manner specified under Chapter 81 (residential) or Chapter 86 (non-residential) of the Maine Public Utilities Commission regulations.

## E. Extensions

1. Time extensions may be granted to Customers in compliance with the following:
  - a. The extension will not result in unreasonable risk to public health within the period of the extension.
  - b. The Customer is unable to comply with the regulations due to compelling factors, NOT exclusively economic.
  - c. Approval by the Service Manager, and
  - d. Endorsement by the District or Department if deemed necessary.
2. Extensions of more than 30 days or involving a Class II or Class III hazard will be signed by both the District and the Customer. The District will provide an agreement form, and failure of the Customer to sign the form will render the agreement void.
3. Failure to meet the terms of the agreement by the specified deadline will result in disconnection proceedings.

## VII. CUSTOMER'S RESPONSIBILITIES

- A. The District holds the current Customer responsible for installation and maintenance of the backflow prevention device.
- B. The Customer, after being notified by a letter from the District, will notify the District as required by notice of his intent to comply with the District's recommendations.
- C. The Customer at his own expense will install, maintain, and have tested as required an approved backflow preventer on his premises. This is a condition of service with the District.
- D. The Customer will only install backflow preventers approved by the District and in a manner approved by the District. Non-testable (primarily residential) backflow devices will be installed directly after the water meter when possible and before any unprotected branches. Testable devices (primarily non-residential) will be installed immediately before the water meter when possible and before any unprotected branches.
- E. Customers with seasonal water meter sets who provide their own backflow preventer must have an approved backflow device in place before the water meter is set. For seasonal sets expected to be in service for more than 30 days, current test results by a certified tester must be submitted within 10 days of the meter being set. For seasonal sets expected to be in service for less than 30 days, the customer must: 1) provide documentation at the time the meter is set that the device has been tested by a certified tester within the last 30 days; 2) have a certified tester on site at the time of the meter set to perform the test; or 3) contract for a fee and in advance with the District or its agent to test the backflow device.

F. The Customer will comply with the District's requirements for testing double-check and reduced pressure zone devices. The tests will be performed by the specified deadline to the District on the forms provided.

G. The Customer will correct any malfunction of the backflow preventer which is revealed by periodic testing. Regarding backflow preventers which fail during testing, the District requires that repair parts be ordered within 24 hours and that shipment be by the fastest means possible. Furthermore, any extended delay (more than seven (7) days) may require discontinuance of service or other means to ensure protection of the public water system. Certain Class III degree hazard situations, if determined by the District to pose a threat to public safety, will not be allowed to continue unprotected if the backflow preventer fails the test and cannot be immediately repaired. The Customer is responsible for the provision of spare parts and should have a supply on hand.

H. Failure to comply with the testing requirements is grounds for discontinuance of service.

I. The Customer will inform the District of any new, potential, proposed, or modified cross-connection and also any existing cross-connection which the Customer is aware of but which has not been found by the District.

J. The Customer will not install a by-pass around any backflow preventer unless there is an approved backflow preventer on the by-pass. Customers who cannot shut down operation for testing must supply the additional devices necessary to allow testing to take place.

## VII. DEGREE OF HAZARD

A. The District recognizes the differences in the threat to the public water system arising from different types of connections. These can be classified as follows:

1. Class I - Low Degree of Hazard: If backflow were to occur, the resulting health significance would be limited to minor changes in aesthetic quality such as taste, odor, or color. The foreign substance must be non-toxic and have no significant health effect.

2. Class II - Moderate Degree of Hazard: If backflow were to occur, the resulting effect on the water supply would be significant in aesthetic qualities. The foreign substance must be non-toxic to humans and non-bacterial in nature.

3. Class III - 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, either chemically, bacteriologically or radiologically. Toxicity may result from either short- or long-term exposure.

B. Examples of establishments, their hazard classification, and containment requirements are:

<u>Establishment</u>	<u>Hazard</u>	<u>Containment</u>
Single Family Residential Home occupation:	I	Dual check

Office (no chemicals)	I/II	Dual check/ <u>double check</u>
Office (chemicals)	II/III	Double check/RPZ
Beauty shop	II/III	Double check/RPZ
Animal grooming	II/III	Double check/RPZ
Food service	II/III	Double check/RPZ
Dark Room	III	RPZ
Antifreeze use (pressure less than or equal to 40 psi)	II	Double check
Antifreeze use (pressure over 40 psi)	III	RPZ
Apt Building (up to 4 units)	I	Dual check
Apt. Building (5 or more units)	II	Double check
Pools (directly plumbed)	II/III	Double check/RPZ
Pools (indirectly plumbed)	I/II	Dual/double check
Solar collectors	II	Double check
Commercial food service facility	II/III	Double check/RPZ
Barber/beauty shops	II/III	Double check/RPZ
Dry cleaners	III	RPZ
Laundromats without dry cleaning	II	Double check
Laundromats with dry cleaning	III	RPZ
Garage/vehicle and equip. repair	III	RPZ
Gas Station (depot type)	I	Dual check
Motels, hotels	II/III	Double check/RPZ
Office buildings	I/II	Dual/double check
Medical/dental offices	II/III	Double check/RPZ
Print shop/no development	II	Double check
Print shop/with development	III	RPZ
Florist shop/no plant growth or irrigation	II	Double check
Florist shop/with plant growth or irrigation	III	RP
Hospitals	III	RPZ
Veterinary offices/kennels	III	RPZ
Mortuaries	III	RPZ
Cemeteries	III	RPZ
Wells	III	RPZ

(This is not intended to be a complete list, only a sampling)

Dual Check: such as a Watts 7, Hersey BSG, or approved equal

Double Check: such as a Watts 709S or 007, or approved equal

RPZ: such as a Watts 909S or 009, Hersey FRP II, or approved equal

## IX. PERMITS

A. Permits for testable backflow devices will be issued by the Department.

B. The type, model, serial number, and make of the backflow preventer as well as the degree of hazard and the frequency of testing will be listed on the permit application. If more than one device is used to protect a single cross-connection, it will be noted on the application.

C. Permits shall be non-transferable.

D. Permits shall be renewed every five (5) years.

## **X. MISCELLANEOUS**

A. **Sprinkler policy:** Fire services or life safety systems installed after June 30, 1987 having fire department connection(s) must be protected by at least an approved double check such as the Watts 709. Systems containing industrial fluids must be protected with an approved reduced pressure principal device such as the Watts 909. Strainers on fire services are not recommended by the District.

B. **Wells:** Any Customer having a private well or other private water source must demonstrate to the District's satisfaction that they are disconnected from the alternate source, or a reduced pressure zone backflow device will be required. Permission to cross-connect may be denied by the District.

C. **Pits:** Pit installations are strongly discouraged; those requested after the state approval date of this program must meet the District's specifications before a permit application will be approved (see BWD standard detail outline).

D. **Exemptions:** Any cross-connection protected against backflow at the time this program goes into effect may continue to that same protection unless

1. The existing protection is grossly inadequate.

2. The Department notifies the District in writing that a change must be made. The exemption will expire when the backflow preventer is replaced, the property changes ownership, or the service is discontinued or otherwise abandoned. The replacement backflow preventer must be that required by the degree of hazard involved.

3. The District determines, through survey results or other methods, that the level of protection needs to be changed.