

BACKFLOW PREVENTION

Backflow means the reversal of water flow from its normal or intended direction of flow. It is possible for the flow to be reversed, known as *backsiphonage* and flow from the customer's plumbing system back into the public water distribution system. If *cross-connections* exist within the user's plumbing system when backflow occurs then it is possible to contaminate the public water system.

A *cross-connection* occurs when a drinking water supply pipe connects to a non-drinking water supply source or pipe. An example of this is a connection with a residential home. For example, if you have a hose that has a submerged end in a kiddie pool or a carwash bucket, this is a cross-connection.

Backsiphonage may occur when the water pressure within the distribution system falls below that of the plumbing system it is supplying. The loss of pressure can be caused by a broken water main, or a fire nearby where the fire department is using large quantities of water. Any building near the break or the fire hydrant being used will experience a lowering of the water pressure.

Where backflow occurs and cross-connections are present you have all the necessary elements for contamination of the plumbing system and subsequently contamination of the public water system.

For example, suppose a automatic lawn sprinkler system is spraying a lawn when all of a sudden a backsiphonage occurs due to a fire truck pumping water or water rushing from a broken main. The resulting backflow from the lawn sprinkler system will flow into the plumbing system and then into the water distribution system. As the water backflows it can suck contamination into the lines through the sprinkler heads, such as insects, pesticides, herbicides, fungicides, fertilizers, worms, and other contaminants. Once in the distribution lines the contamination could go anywhere in the public water system.

To prevent backflow from non-potable sources into our public water system check valves or backflow prevention devices installed at the site of the cross-connection can protect the plumbing system from contamination. Placed just downstream of a water meter to an establishment, they can protect the public water system from any contamination that may occur within the entire establishment's plumbing system.

This requirement is in accordance with the Belfast Water District's Cross-Connection Control Program approved by the Maine Department of Human Services on May 27, 1981 and revised June 21, 2002. The program derives its enforceability from Title 22, MRSA, C601, sub-chapter 2, Sec. 2612 (5) Maine Department of Human Services, Cross-Connection Rules 10-144ACMR226 effective November 1, 1979, The Maine State Plumbing Code, Occupational Safety and Health Act and the Maine Public Utilities Commission.

CROSS - CONNECTION CONTROL PROGRAM

BELFAST WATER DISTRICT

BELFAST, MAINE 04915

**Approved by Trustees
May 13, 1981**

**Approved by
Department of Human Services
May 27, 1981**

**Revised and Approved by Trustees
November 21, 2005**

**Revised and Approved by Trustees
January 11, 2016**

**Revised and Approved by Trustees
June 21, 2002**

**Approved by
Department of Human Services
June 26, 2002**

**Approved by
Department of Human Services
January 6, 2006**

**Approved by
Department of Human Services
January 15, 2016**

TABLE OF CONTENTS

Section

1	Purpose	1
2	Authority .	1
3	Scope	1
4	Definitions .	2, 3
5	Administration	4
6	Degree of Hazard .	5
7	Approved Devices .	6
8	Cross-Connection Approval .	6
9	Responsibilities - Belfast Water District	6, 7
10	Responsibilities - Property Owner	8
11	Miscellaneous	8

BELFAST WATER DISTRICT

Cross-Connection Control 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 Belfast Water District's (BWD) system by

- Containing at the water service entrance such contaminants or pollutants which could backflow or back-siphon into the public water system
- Promoting the elimination or control of cross-connections — both actual and potential,
- Providing a continuing program of cross-connection control

II. AUTHORITY

This program derives its authority from

- the Federal Safe Drinking Water Act of 1974, Title 22, MRSA 42(1), 42 (3), 2612 (2)
- 10-144 MRSA Chapter 226 (State of Maine Cross-Connection Rules)
- Maine State Internal Plumbing Code as administered by Maine's Dept. of Professional and Financial Regulation 02-395 CMR 4

III. 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 back siphonage through the "containment" approach, and that all devices successfully pass testing on a regular schedule to ensure system integrity.

This requires the installation of and periodic testing of an approved backflow prevention device at the water meter by the owner at the owner's expense. Fixture isolation alone is not deemed an acceptable method of backflow prevention by the District within its distribution system. Installation of and continuing testing and proper functioning of a cross-connection prevention device is a condition of service with the District.

Recognizing that many tenants assume responsibility for cross-connection prevention and act as the owner's representative, the property owner is ultimately responsible for compliance with the District's cross-connection control program.

BELFAST WATER DISTRICT

Unless otherwise specified, the Maine State Internal Plumbing Code and the State of Maine Cross-Connection Rules are the minimum acceptable standards. The District may adopt more stringent requirements.

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

Fire suppression systems are addressed under the "Miscellaneous" section of this program.

IV DEFINITIONS

- 1 **Anti-Backflow Assembly** — An anti-backflow device with gate valves directly before and after it.
- 2 **Anti-Backflow Device** - A device or means to prevent backflow. For the purposes of this program, the term "backflow device" shall include the term "Anti-Backflow Assembly".
- 3 **Approved Source** - A source of water utilized by a public water system for distribution to the public for consumptive or other purposes and which is approved by the Department for such use, following a required and/or approved treatment process.
- 4 **Backflow** - The undesirable reversal of the flow of water or mixtures of water and other liquids, gases, or other substances into the distribution pipes of a public water supply from any source or sources other than the public water system's approved source.
5. **Backflow Preventer** - An anti-backflow device such as
Reduced Pressure Principle Type - An assembly that consists of two independently acting internal loaded, check valves, a differential pressure relief valve, four properly loaded test cocks and two isolation valves (often referred to as an RPZ).
Double Check Assembly - 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.
Dual check valve - A device having two independently acting, approved check valves. Used primarily in residential and low hazard non-residential situations.
- 6 **Back-Siphonage** - Backflow resulting from negative or less than atmospheric pressures in the distribution pipes of a potable water supply.
- 7 **Commissioner** — Department of Health and Human Services Commissioner
- 8 **Containment** — BWD's required method for protection from contamination by a facility with internal cross connections of a supplier's public water system. This method of backflow prevention requires a backflow preventer (containment device) at the water service entrance.
- 9 **Contaminant** — Any chemical, biological, or radiological substance or matter which is an impairment of the water quality of the water which creates an actual hazard to the public health through poisoning or through the spread of disease by sewage, industrial fluids or waste.

BELFAST WATER DISTRICT

- 10 **Cross-connection** - Any physical or potential connection, or structural arrangement between two otherwise separate systems, one of which contains potable water and the other which contains water of unknown or questionable safety and/or steam, chemicals, gases or other contaminants and/or pollutants, whereby there may be a flow of an unapproved water to the potable water supply.
- 11 **Customer** - A person, firm, corporation, or governmental division which has applied for and been granted service, and is responsible for payment of the service.
- 12 **Department** - Maine Department of Health and Human Services, Maine CDC, Division of Environmental Health, Drinking Water Program.
- 13 **District** — Belfast Water District
- 14 **Domestic service** — A line which supplies potable water for non-fire protection uses such as drinking, bathing, culinary, heating, and process water purposes.
- 15 **Fire service** - A water line which supplies water for fire protection to a fire sprinkler or life safety system.
- 16 **High Hazard**- a contamination hazard, as defined in the Maine State Internal Plumbing Code at 02-395 CMR 4. If a backflow were to occur, the resulting effect on the water supply could cause illness or death if consumed by humans. The foreign substance (contaminant) may be toxic and/or harmful to humans either from a chemical, bacteriological, or radiological standpoint. The effects of the contaminants may result from a short or longterm exposure.
- 17 **Industrial Fluids** — Shall mean 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, pollutional or plumbing hazard if introduced into an approved 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 system which may deteriorate in sanitary quality; chemicals in fluid form; plating acids and alkalies; circulated cooling waters connected to an open cooling tower and/or cooling waters that are chemically or biologically treated or stabilized with any substances; contaminated natural waters such as from wells, springs, streams, rivers, bays, harbors, seas, irrigation canals or systems, etc.; oils, gases, glycerin, paraffines, caustic and acid solutions and other liquid and gaseous fluids used in industrial or other processes or for fire fighting purposes.
- 18 **Low Hazard**- a pollution hazard, as defined in the Maine State Internal Plumbing Code at 02-395 CMR 4. If a backflow were to occur, the resulting health significance would be limited to changes in aesthetic quality such as taste, odor or color. The foreign substance must be non-toxic and non-bacterial in nature with no significant health effect.
- 19 **Owner** - Any person, firm, corporation, or other entity who has legal title to, or license to operate or inhabit, a property upon which a cross-connection inspection is to be made or upon which a cross-connection is present.

BELFAST WATER DISTRICT

- 20 **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.
- 21 **Pollutant** - A foreign substance that impairs the quality of the water to a degree which does not create a hazard to the public health but which does adversely and unreasonably affect the aesthetic quality (taste, odor or color) of such water for domestic use.
- 22 **Potable Water** - An approved water source, free from impurities present in any amount sufficient to cause disease or harmful physiological effects. An approved water source whose physical, bacteriological, chemical and radiological quality must conform to the requirements of the Maine State of Maine Rules Relating to Drinking Water at 10-144 CMR 231.
- 23 **Residential Hazard** - Any connection that has the same level of hazard as a typical residential household. Public water suppliers can increase protection from residential cross connection hazards using anti-backflow devices at the discretion of the supplier.
- 24 **Temporary meter set** - a meter which is set for a limited amount of time (such as but not limited to the summer) for a specific purpose (such as a swimming pool, fountain, or fair)
- 25 **Water Service Entrance:** That point in the property'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.

V ADMINISTRATION AND APPROVAL

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. The District will review its program at its discretion, and modifications will be 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. 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 Owner will comply with the District's recommendations.

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

D. The District is not responsible for any cross-connections beyond the water service entrance.

BELFAST WATER DISTRICT

VI DEGREE OF HAZARD

- A. Definitions of low hazard, high hazard, and residential hazard are contained in Section IV.
- B. BWD's requirements include but are not limited to:

SETTING	HAZARD	CLASSIFICATION
Single family residential	Without home occupation	Residential hazard
Home occupation		
	Beauty shop	High hazard
	Animal grooming	Low hazard
	Catering (primarily off-site)	Low hazard
	Photo dark room	High hazard
	Chemicals in use	High hazard
	Antifreeze in use	High hazard
Apartment buildings	Up to and including 4 units	Residential
	Five or more units	Low hazard
Commercial food service		High hazard
Dry cleaners		High hazard
Fire suppression system	Depends on system components	Low/high hazard
Flower shop	No greenhouse	Low hazard
Garage	Performs repairs	High hazard
Gas station	Depot type	Residential
Greenhouse		Low hazard
Hospitals/nursing homes		High hazard
Medical/dental facilities		High hazard
Mortuaries		High hazard
Pool	Directly plumbed	High hazard
Print shop	Chemicals in use	High hazard
Solar collectors		High hazard
Veterinary clinics/kennels		High hazard
Wells	(unless complete separation demonstrated to BWD)	High hazard

BELFAST WATER DISTRICT

VII APPROVED DEVICES

All anti-backflow devices must be listed and labeled in the Maine State Internal Plumbing Code (table 6.2 at the time this program takes effect).

Any devices installed after July 1, 2012 must be NSF 61 certified for lead content.

VIII CROSS CONNECTION APPROVALS

A. A cross-connection will not be allowed unless the District approves it as necessary. All cross-connections will be protected by backflow prevention devices, assemblies, and methods specified in the Maine State Internal Plumbing Code.

B. **New installations:** The District will determine the degree of hazard and the required backflow prevention based on on-site inspection, the cross-connection application, and/or other information provided.

C. **Existing installations:** The owner or a representative thereof will inform the District of any changes in hazard, and may request an inspection for hazard reclassification. Existing devices may continue in service unless the degree of hazard supersedes the effectiveness of the device, or poses an unreasonable risk to public health.

D. **Review:** Cross connections will be reviewed for re-approval at the discretion of the District. If no change in hazard has occurred, approval is automatically granted. If a change in hazard has occurred, a modification in cross-connection protection maybe required.

E. **Information:** The District may require copies of plan, drawings, reports, or specifications related to the service connection or cross-connection at the Owner's expense

IX RESPONSIBILITIES - District or its agent

A. **Records and Reports:** The District will

- maintain a copy of its current approved Cross-Connection Prevention Program, and will make it available on request.
- maintain records of devices and required tests in accordance with the State of Maine Cross Connection Rules
- recognize backflow preventer testers who have successfully completed a training course recognized by New England Water Works Association or American Backflow Prevention Association. The District reserves the right to observe testing as performed by any certified individual.

BELFAST WATER DISTRICT

B. Periodic inspections. The District will

- determine the degree of hazard and the appropriate cross-connection prevention device required
- base the requirement on the hazards observed during the inspection, the current use of the building, or other related information. A change to higher or lower hazard classification must be approved by the District, and may occur should new information be received or observed.
- perform needed inspections for actual or potential cross-connections during normal working hours. At its discretion, the District may perform the inspection - with costs borne by the owner - outside of normal business hours.
- Provide notification of any necessary installation, correction or change; the time allowed for correction; and any additional responsibility such as required testing.
- allow a maximum of 30 calendar days from the initial written notification for correction
 - unless a good cause for a time extension can be demonstrated to the District's satisfaction (see Sec 9E) or
 - the safety of the system or public health are at risk
- inspect the installation when completed as required
- reserve the right to perform periodic testing - at its cost - of any device in its system

C. Periodic testing. Recognizing that any backflow preventer can fail and any method of protection can be subverted, the District will

- determine the testing intervals for each device
- provide notification in advance of the testing deadline (see below)
- provide notification of failure to meet the testing deadline
- inspect dual check devices at no charge following installation and when a water meter is changed
- require a successful test for service lines typically active for more than 90 consecutive days
 - once each calendar year
 - notification at least four months in advance
- require a successful test for service lines typically active less than 90 consecutive days
 - within 10 calendar days of service line activation
 - notification prior to or at the time of activation
- require tests more frequently - at the owner's expense - based on a history of test failure or on the degree of hazard
- require repairs or replacement by deadline set by the District (typically 10 business days) at owner expense. Regarding backflow preventers which fail during testing, the District may require that repair parts be ordered within 24 hours and that shipment be by the fastest means possible. Furthermore, any extended delay (more than 10 business days) may require discontinuance of service or other means to ensure protection of the public water system. Certain high 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 Owner is responsible for the provision of spare parts, repair tools, or replacement devices, and should have a supply on hand.

BELFAST WATER DISTRICT

- D. Disconnection for Non-Compliance:** The District will
- commence disconnection proceedings in the manner specified under Chapter 660 of the Maine Public Utilities Commission regulations.
- E. Extensions:** Time extensions may be granted in compliance with the following:
- The extension will not result in unreasonable risk to public health within the period of the extension.
 - The extension does not exceed 30 calendar days.
 - Compliance with the regulations by the deadline is not possible due to compelling factors, NOT exclusively economic.
 - The extension is approved by the Service Manager, with an endorsement by the District's General Manager or the Department (DHHS) if deemed necessary.
 - The extension will be signed by both the District and the Owner on a form provided by the District. Failure of the Owner to sign the form will render the agreement void.
 - Failure to meet the terms of the agreement by the specified deadline will result in disconnection proceedings.

X RESPONSIBILITIES - Property Owner

The owner will — at his expense — comply with program requirements, including

- Providing access for inspection or testing
- Allowing no unprotected cross-connections including bypass lines
- Installing of appropriate backflow prevention device in compliance with all District specs
- Providing maintenance or replacement to ensure a successful test
- Providing testing by an accepted tester whose license is current by the specified deadline
- Providing written test results to the District in a format acceptable to the District signifying the device is functioning properly
- Providing information to the District if property use would require a change in cross-connection protection (new, existing, proposed, or modified).

XI MISCELLANEOUS

Fire sprinklers / strainers: The District recommend that strainers be installed on double-check and reduced pressure zone valves directly upstream of the device to prevent possible fouling of the device by both foreseen and unforeseen circumstances such as water main breaks, fires, flushing of mains, which may stir up debris within the water main.

BELFAST WATER DISTRICT

CROSS CONNECTION CONTROL PROGRAM

BELFAST WATER DISTRICT

285 NORTHPORT AVENUE

BELFAST, ME 04915

Approved by the Belfast Water District Board of Trustees:

Signed: Archie J. Gaul Date: 1/11/16
Archie J. Gaul, Chairman

Signed: Stephen J. Hall Date: 1/11/16
Stephen J. Hall, Vice Chairman

Signed: Henry L. Chalmers Date: 1/11/16
Henry L. Chalmers, Treasurer

Signed: Eileen Dubinett Date: 1-11-16
Eileen Dubinett, Secretary

Signed: Bruce Osgood Date: 1-11-16
Bruce Osgood, Trustee

Signed: Keith Pooler Date: 1/11/16
Keith Pooler, Superintendent

Approved by the State of Maine, Department of Human Services

By: Ryehl Nash

Title: Field Engineer

Date: 1/15/16