PORTLAND WATER DISTRICT

CROSS-CONNECTION CONTROL PROGRAM

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I. PURPOSE & SCOPE

A. To protect the public water system of the Portland Water District (District), from the possibility of contamination or pollution by cross-connections. The primary method for protection of the public water system will be the installation of an approved backflow preventer at the water service entrance to the Owner's premises.

B. To promote the elimination or control of actual or potential cross-connections between the District's public water system and the Owner's private water system.

C. To provide for a continuing program of cross-connection control, which will effectively prevent the contamination or pollution of the public water system by cross-connection.

II. AUTHORITY

A. This program derives its enforceability from the Federal Safe Drinking Water Act of 1974, and the statutes of the State of Maine, 22 M.R.S.A. §§ 42(1), 42(3), 2612(2) & 2612(5) Maine Department of Health and Human Services, Division of Environmental Health, Cross-Connection Rules 10-144.

B. In addition, authority rises from the Rules and Regulations as adopted by the Portland Water District and as approved by the Public Utilities Commission of the State of Maine, from provisions of the Occupational Safety and Health Act, and from provisions of the Maine State Internal Plumbing Code as administered by the Department of Professional and Financial Regulation 02-395 CMR 4.

III. RESPONSIBILITIES

The Portland Water District's mission is to protect public health, safety, and the environment by providing our customers first-class water, wastewater, and related services. If, in the judgment of the Director of Water Services, an approved backflow preventer is required at the water service entrance to any Owner's premises to prevent backflow into the public water system, the Director, or his delegated agent, shall give notice to the Owner to install an approved backflow preventer. It shall be the responsibility of the Owner to comply with all provisions of the Cross-Connection Control Program of the District including the installation and maintenance of approved backflow preventers. Failure or refusal to install and maintain such devices, or allow access for inspection, shall constitute grounds for discontinuance of water service to the premises until such devices have been properly installed to the satisfaction of the District.

IV. DEFINITIONS

Approved
Accepted by the District as meeting the applicable specification or procedures as stated or cited in these regulations.

Approved Source
A source of potable water approved by the District for distribution to the public for consumptive purposes following a required and approved treatment process.

Auxiliary Water Supply
Any water supply other than the District's approved source, on or available to the Owner's premises and used for consumptive and/or other purposes.

Backflow
The undesirable reversal of flow of water or other foreign liquids, gases or other substances, under positive or reduced pressure, into the District's public water system from any source.

Backflow Preventer
A backflow protection device or means designed to prevent backpressure or backsiphonage. Examples of which are contained herein (testable and atmospheric devices are not approved for submerged applications, i.e. meter pits):

Air Gap Separation
A physical separation of at least two (2) pipe diameters, but not less than one inch, to prevent backflow between the free-flowing discharge end of the public water system and any other system. An air gap may be easily defeated if the proper gap distance is not maintained, thus requiring frequent inspections to verify backflow protection is achieved.

Atmospheric Vacuum Breaker (AVB)
A device that prevents backsiphonage by creating an atmospheric vent where there is either a negative pressure or sub-atmospheric pressure in a water system. Atmospheric vacuum breakers are among the simplest and least expensive mechanical means of backflow protection. Not an acceptable containment device.

Double Check Valve Assembly (Testable DCVA)
A device having two (2) independently operating spring-loaded check valves, with shutoff valves and test cocks for regular testing. They may be used under continuous pressure to protect against both backpressure and backsiphonage.

Dual Check Valve Assembly (Non-testable Dual Check)
A device containing two (2) independently acting spring loaded check valves without test cocks. It is used primarily on residential services and is not subject to periodic testing.

Hose Bibb Vacuum Breaker (HBVB)
A device that is permanently attached to a hose bibb and which acts as an atmospheric vacuum breaker (AVB). Not an acceptable containment device.

Reduced Pressure Principle Backflow Preventer (Testable RPZ)
An assembly consisting of two (2) independently operating spring-loaded check valves with an automatically operating differential relief valve located between the two check valves. Includes 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.

Backpressure
: A condition in which the Owner's water system pressure is greater than the District's water system pressure at the service entrance. This condition can force hazardous substances into the public water system.

Backsiphonage
: Backflow resulting from negative or less than atmospheric pressure in the District's public water system. This reduced pressure will allow water to flow opposite the normal direction of flow, potentially introducing hazardous substances into the public water system.

Certified Backflow Prevention Device Tester
: A person certified by New England Water Works Association (NEWWA), the American Backflow Prevention Association (ABPA), or the American Society of Safety Engineers (ASSE) as having completed necessary training in the testing of backflow devices.

Containment
: A method of backflow prevention that requires a PWD approved backflow preventer at the water service entrance to prevent backflow of hazardous substances from an Owner’s premises into the District's public water system. Protection by containment protects the District's public water system and is in no way meant to protect the premises from internal cross-connections that may be present.

Containment Device
: An approved backflow preventer installed at the service entrance, immediately down-stream of any required District water meter and prior to any branch in the private piping.

Contaminant
: A substance that will impair the quality of the water to a degree that it creates a contamination hazard to the public leading to poisoning or the spread of disease, by sewage or waste.

Cross-Connection
: Any physical or potential connection or arrangement between two otherwise separate piping systems, one of which contains potable water and the other water or other substances of unknown or questionable safety, whereby water or other substances may flow from one system to the other. The direction of flow depends on the pressure differential between the two systems.

Cross-Connection Control Program
: The administrative and technical procedures the District implements to protect the public water system from contamination via cross connections.

Department
: State of Maine Department of Health and Human Services Drinking Water Program.

District
: The Portland Water District.

Director of Water Services
: The Director, or his delegated representative in charge of the Portland Water District water services, invested with the authority and responsibility for the implementation of the Cross-Connection Control Program and for the enforcement of the provisions herein.

Fixture Isolation
: A method of backflow protection in which a backflow preventer is located at or near the potential source of hazard, which is generally a plumbing fixture, to correct an internal cross-connection within an Owner's premises.

Owner
: Any person who has legal title to or license to operate or inhabit a property served by the District's public water system through a service connection.

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.

Plumbing System
: A system of pipes, valves, and appurtenances used to convey water for a wide range of applications.

Pollutant
: A foreign substance that, if permitted to get into the public water system, will degrade its quality so as to constitute a pollution hazard or impair the usefulness or quality of the water to a degree which does not create an actual hazard to the public health but which does adversely and unreasonably affect such water for domestic use.

Potable Water
: An approved water, free from impurities present in any amount sufficient to cause disease or harmful physiological effects. Its physical, chemical, bacteriological and radiological quality conforms to the Maine Safe Drinking Water Regulations or any regulations pertaining thereto.

Premises
: Any house or building, together with its land and structures, occupied as a residence or business

Private Water system
: Any privately owned plumbing system that begins at the point of delivery from the public water system and is located within the property lines of the Owner's premises, containing all water piping, fixtures, devices, fittings and connections.

Public Water System
: Any publicly owned plumbing system through which potable water is sold, furnished or distributed to the public for human consumption and which is under the control of the District. The system shall not include any portion of a private water system owned and maintained by the Owner.

Substantial Renovation
: Renovations in which all, or substantially all, of a building or a buildings plumbing system is removed, replaced, or expanded. Renovations need not involve major structural changes to be considered substantial by the District.

Water Service Entrance
: The point of potable water delivery to the Owner's premises, which is beyond the control of the District and is first readily accessible for connections. This will ordinarily be at the point where the water service enters the building and always before an unprotected connection.

V. ADMINISTRATION

A. The District will operate the Cross-Connection Control Program, to include the keeping of necessary records to fulfill Department requirements.

B. The District will protect the public water system through containment; it is the responsibility of the Owner to control water quality on the premises beyond the District prescribed backflow preventer.

C. The District shall review the Cross-Connection Control Program at least every five (5) years. Updates shall be made as needed and communicated to the public.

D. The Owner shall follow the provisions of the District's Cross-Connection Control Program.

E. The Owner shall ensure the proper operation and maintenance of a backflow preventer and the registration and testing as required by the Maine State Internal Plumbing Code.

F. The Owner shall provide access upon request during normal working hours to the premises for any representative of the District, Department, or any other state or federal agency authorized to do so for the express purpose of inspecting cross-connections and/or backflow preventers.

G. The Owner shall provide copies to the District of any plans, drawings, reports or specifications relating to the private water system.

VI. REQUIREMENTS

A. All water service connections to the District's public water system, including connections provided specifically for fire suppression systems, shall be evaluated by the District for cross-connection potential and assigned a degree of hazard. The District shall not allow an unprotected cross-connection at any point within its public water system.

B. Cross-connections shall be protected from backflow, under any backpressure or backsiphonage condition, by the use of backflow preventers, assemblies, and methods specified in the Maine State Internal Plumbing Code at 02-395 CMR 4.

C. The Owner shall install only backflow preventers of type and manner approved by the District. The Owner agrees to bear all costs for the installation, testing, repair, maintenance and replacement of the backflow preventer.

D. The Owner shall not install a by-pass around any backflow preventer unless there is the same type of backflow preventer on the bypass. The Owner shall not make a connection to the water service line prior to the backflow preventer.

E. The Owner shall inform the District of any new or modified cross-connections within the premises, also any existing cross-connection that the Owner is aware of but has not yet been discovered by the District. The Owner agrees to obtain approval from the District for all changes in water use and shall comply with any additional requirements imposed by the District for cross-connection control.

F. The Owner shall be responsible for submitting the following to the District: Backflow preventer test results; the name and certification of the certified backflow device tester; the nature of device test failures if any; and the status of necessary repairs.

G. The Owner shall correct any malfunction of the backflow preventer, which is revealed by regular testing or discovered by PWD. This shall include the replacement of any parts or the replacement of the backflow preventer in whole, if deemed necessary by the District.

H. The District may allow re-establishment of service before the repair or replacement of a backflow preventer when the District determines that no immediate threat to the public exists, and after an agreement has been made between the District and the Owner indicating the intention of the Owner to comply with the provisions of these rules. A confirmed purchase order and installation date shall be evidence of good intention to comply by the Owner.

I. Any Owner having an auxiliary water supply must have permission from the District for any proposed connection to the public water system. The District may deny permission to connect to the public water system while an auxiliary water supply is present. The Owner will be required to install a backflow preventer at the service entrance from the public water supply if the auxiliary water supply is maintained by the Owner, regardless of an identified cross-connection to the District's system.

J. Effective the date of the acceptance of this Cross-Connection Control Program revision, all new residential buildings and substantial renovations (determined by the District), will be required to install a Dual Check Valve Assembly backflow preventer immediately downstream of the water meter. Installation of the dual check valve assembly results in a potential closed loop system within the premises. The Owner shall make provisions to provide for thermal expansion within this closed loop system, i.e. the installation of thermal expansion devices and/or pressure relief valves.

K. At the discretion of the District, water service may be terminated if the District determines at any time that a threat to the public health exists, regardless of the status of the installed backflow preventer.

L. The Owner agrees to indemnify and hold harmless the District from an unprotected or inadequately protected cross-connection within the Owner's premises.

VII. DEGREE OF HAZARD

The District 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 preventers. These hazards can be classified as follows:

A. **Low Degree of Hazard / Residential 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.

B. **High Degree of Hazard**

A contamination hazard, as defined in the Maine State Internal Plumbing Code at 02-394 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 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 long-term exposure.

Please refer to Table 1 in Appendix A: Device Type Based on Water Use and Degree of Hazard for a list of water uses and the corresponding backflow device requirement for the degree of hazard.

VIII. CROSS-CONNECTION APPROVALS

The District shall not approve an unprotected cross-connection to the public water system. A backflow preventer is required to protect the public water system from backflow anywhere a connection or potential for one exists.

The District shall review all requests for connections to the public water system. The review will include the degree of hazard of any cross-connection and the method of backflow prevention specified. All backflow preventers, assemblies, and methods must be approved per the requirements of the current Maine State Internal Plumbing Code 02-395 CMR 4. When the District determines that backflow protection has been adequately addressed, the District will grant approval to the applicant seeking connection to the public water system.

IX. EXEMPTIONS

For premises existing prior to the start of the program, the District will perform evaluations and inspections at times of redevelopment or when the Owner requests a change in the quantity or type of service provided. Any existing properly functioning backflow preventer shall be allowed by the District to continue in service unless the degree of hazard is such as to supersede the effectiveness of the existing backflow preventer, or result in an unreasonable risk to the public health. Where no backflow preventer is present, or the degree of hazard at the premises has increased, a new backflow preventer must be installed and/or an existing backflow preventer must be upgraded to a device equitable to the degree of hazard present as described in Table 1 in Appendix A. The duration to accomplish such action shall be dependent on the degree of hazard involved as determined by the District. An exemption shall not alter the degree of hazard classification of the cross-connection and shall not exclude the use of some other appropriate backflow preventer. Each exemption may be conditioned on monitoring, testing, analyzing or other requirements to ensure the protection of public health, and shall include a compliance schedule.

X. REGULAR TESTING

Regular testing and inspection of all backflow preventers is necessary to ensure that the backflow preventer has not failed and the method of protection subverted.

A. The District shall be responsible for conducting the initial test and inspection of an Owner's installed backflow preventer at time of service activation. The Owner shall be charged for any testing and inspection performed by the District.

B. The Owner is responsible for regular testing and inspection of the backflow preventer. A certified backflow device tester shall perform the tests on a schedule established by the District. The Owner must inform the District of all test results. Failure by the Owner to test and inspect the device may result in the District performing the work or disconnecting the service.

C. The Owner must repair any backflow preventer that fails during testing as soon as possible. Any extended delay shall require disconnection of service or other means to ensure protection of the public water system unless the District grants an exemption. Upon completion of the repair, the device will be re-tested at the Owner's expense to ensure correct operation.

D. Certain high degree of hazard cross-connections will not be allowed to continue unprotected if the backflow preventer fails testing and inspection and cannot be immediately repaired. Parallel installation of two devices is an effective means for the Owner to ensure uninterrupted water service during testing or repair and is strongly recommended when the Owner desires such continuity.

E. The minimum testing frequency for backflow preventers on domestic and fire services connected to the District's public water system shall be as follows:

(1) Reduced pressure principle backflow preventers on high degree of hazard cross-connections shall be tested and inspected at least annually or as directed by the District.

(2) Double check valves assemblies, reduced pressure principle backflow preventers and pressure type vacuum breakers on low degree of hazard cross-connections shall be tested annually.

(3) Mechanical air gaps shall be inspected annually. If the air gap has been defeated, a reduced pressure principle backflow preventer shall be installed at the service entrance.

F. Backflow preventers may be tested more frequently than as specified above in cases where there is a history of test failures, or the District feels that due to the degree of hazard involved additional testing is warranted. Cost of the additional tests will be borne by the Owner.

G. As a quality assurance measure, the District may randomly select devices for additional testing. This testing, performed by the District, will be at no additional cost to the Owner.

H. When an Owner elects to install a testable backflow preventer in an application where a testable device is not required by the District's Cross-Connection Control Program, the Owner need not test the device annually for the benefit of the District or in satisfaction of the District's testing requirements. The District recommends the Owner follow the manufacturer's guidance for the testing and inspection of the device and will accept results from the Owner for informational purposes.

XI. RECORDS AND REPORTS

Records of cross-connection control devices and locations shall be kept on file with the District as long as the cross-connection is present and until five (5) years after the cross-connection is eliminated. Records of tests for testable cross-connection control devices shall be kept on file with the District and available for inspection by District staff.

The District shall have on file and make available to the public a list of private contractors who are certified with the New England Water Works Association (NEWWA), American Backflow Prevention Association (ABPA), and the American Society of Safety Engineers (ASSE) as backflow device testers.

XII. FEES AND CHARGES

A cross connection device must be tested and operated to the standards outlined in the District's Cross-Connection Control Program as approved by the State of Maine's Department of Health and Human Services.

The District will perform the initial test and inspection of the backflow preventer at the time of service activation, the cost of which will be incurred by the Owner. Regular testing of the device, done by private contractors hired by the Owner and at the cost to the Owner, must verify compliance with the program. If the Owner requests additional tests from the District on a periodic basis, the costs to perform the work can be found in the District's Terms and Conditions.

XIII. FIRE PROTECTION SERVICE LINES

A. All new fire sprinkler systems and new fire service lines connected to the District's public water system, and all existing unprotected fire sprinkler systems receiving substantial renovations (determined by the District), will be protected from backflow by the installation of a testable double-check valve assembly backflow preventer at the service entrance and before the fire sprinkler valve.

B. All fire sprinkler antifreeze loop systems and systems with chemical additives will be protected from backflow by the installation of a reduced pressure principle backflow preventer at the fire service entrance and before the fire sprinkler valve.

C. Backflow preventers for fire sprinkler systems shall be tested and inspected per the frequency as outlined in Section X.

D. Fire protection service lines dedicated for private fire hydrants only are not required to have backflow preventers installed on the service line.

E. Fire hydrants used for truck fill operations shall be protected from backflow by an approved air gap between the end of the filling hose and the water storage container on the truck.

F. The rules in this section do not apply to Section XIV, NFPA 13D Residential Life Safety Sprinkler Systems; automatic sprinkler systems for one and two family dwellings and manufactured homes.

XIV. NFPA 13D RESIDENTIAL LIFE SAFETY SPRINKLER SYSTEMS

Facilities designed to be protected through an approved automatic sprinkler system installed on the domestic service line, in accordance with NFPA 13D standards, must provide backflow protection through a non-testable dual check valve assembly at the service entrance, immediately after the meter and before any branch line.

XV. LIABILITY

The District, its employees or agents, shall not be liable to any person for any damage, injuries or loss arising out of any act or omission by the District, its employees or agents, in connection with these rules.

APPENDIX A: DEVICE TYPE BASED ON WATER USE AND DEGREE OF HAZARD

Water Use	System / Degree of Hazard	Device Type	
		Residential	Non-Residential
Domestic Water	Low Hazard / Residential Hazard	Non-Testable Dual Check***	Testable DCVA
	High Hazard*	Testable RPZ	Testable RPZ
Irrigation Water	Dedicated landscape Irrigation**	Testable RPZ	Testable RPZ
Private Fire Protection	NFPA 13/13R	Testable DCVA	Testable DCVA
	NFPA 13 (with chemical agents)	Testable RPZ	Testable RPZ
	NFPA 13D	Non-Testable Dual Check	N/A

TABLE 1

Backflow protection devices listed above are considered the minimum standard for the assumed degree of hazard. The District will evaluate each water system as necessary to determine appropriate degree of hazard present.

*The District considers the following installations to warrant a High Hazard classification:

- Hazardous Material Sites
- Hospitals, Dental Facilities, and Medical Centers
- Laboratories
- Veterinary Clinics
- Food Processing and Beverage Bottling Facilities
- Piers, Docks, and Marinas
- Plasma Centers
- Dry Cleaners
- Mortuaries
- Car Wash Facilities
- Processing Plants
- Auxiliary Water Supplies
- Metal Plating Facilities
- Restricted Access Facilities
- Sewage Treatment Plants and Pump Stations
- Waste Dump Stations
- Commercial Greenhouses
- Others as determined by PWD

** For residential and non-residential landscape irrigation systems connected to the internal plumbing system after the backflow preventer, backflow protection shall be achieved through the appropriate containment device associated with the degree of hazard of the domestic water service. Fixture isolation shall be the responsibility of the Owner per the State of Maine plumbing code.

*** Backflow protection for multi-family residential shall be based on the size (at the tap) of the domestic service line supplying water to the site. For domestic services of 2” diameter and less, a non-testable dual check valve assembly is acceptable. For domestic services greater than 2”, a testable double check valve assembly is required at a minimum.