LOUDOUN WATER

Cross Connection Control Manual

Revised May 2023

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I. Introduction

Mission Statement

To protect the public drinking water distribution system through an effective and proactive cross-connection control and backflow prevention program and promote the health and safety of plumbing systems to protect customers from the hazards of backflow.

Introduction

Loudoun Water is responsible for providing water and wastewater service to our customers in Loudoun County and Western Community Systems of Loudoun County. The focus of this document is to assure proper protection of the water distribution system is in place, and to educate staff and others about the Cross Connection Program policies and procedures.

Cross connection, as defined in the Virginia Administrative Code 12VAC5-590 (hereinafter referred to as the "Waterworks Regulations"), is "any actual or potential link, connection, or physical arrangement, direct or indirect, between used water, an auxiliary water system, or other source of contamination or pollution to the waterworks through which backflow can occur". Therefore, either cross connections or the chance of backflow must be eliminated to prevent degrading the high quality of water that waterworks owners strive to maintain.

In 1974, the Waterworks Regulations were adopted to conform with the Federal "Safe Drinking Water Act," PL 93-523 (as amended) and Federal Regulation 40 CFR Part 141. The latest revision to the Waterworks Regulations was effective December 2021. Section 12 VAC5-590 of the Waterworks Regulations set guidelines requiring that a Cross Connection/Backflow Prevention Program be established and enforced for each waterworks by the owner of the waterworks.

The Loudoun Water Cross Connection Control Program is in accordance with the Virginia Department of Health (VDH) Waterworks Regulations 12VAC5 590-580 et. seq. The VDH Waterworks Regulation (12VAC5 590-580 A) requires a waterworks owner, as a condition for issuance and continued use of the VDH Waterworks Public Water Supply Operating permit, establish and enforce a program of cross connection control and backflow prevention.

> ***12VAC5-590-580. General requirements for cross-connection control and backflow prevention.***
>
> *A. Every owner shall establish and enforce a cross-connection control program (CCCP) in accordance with 12VAC5-590-360. The goal of the CCCP is to prevent the intrusion of contamination into the distribution system via cross connections and backflow. The owner shall document the CCCP activities in a cross connection control plan and submit the written document to the department for review and approval.*
> *B. No owner shall install, maintain, or allow a service connection to any premises where cross connections to a waterworks or a consumer's water system exist, unless the owner and department ensure the cross connections are adequately safeguarded.*
> *C. No owner shall install, maintain, or allow any connection whereby water from an auxiliary water system may enter a waterworks or consumer's water system, unless the owner and department approve the auxiliary water system, the method of connection, and use of such system.*
> *D. The owner, in accordance with 12VAC5-590-510 C, shall maintain acceptable working pressures in the distribution system to reduce the potential for backflow to occur.*

The Loudoun Water Cross Connection Control Program was developed in 1982 and continues to be updated and revised.

Administration

The Cross Connection Control Program Manager designated by Loudoun Water is responsible for managing and administering the Loudoun Water Cross Connection Control Program. This is accomplished by following and enforcing Virginia Department of Health regulations as well as requirements per the most recent Virginia Construction and International Plumbing codes.

Purpose

The purpose of this program is to protect the public potable water supply from the possibility of contamination and to promote the elimination or control of actual or potential cross connections in the public water supply.

This program manual includes information related to the following activities to protect Loudoun Water's Central System drinking water distribution system:

- Examines the Virginia Department of Health (VDH) Waterworks Regulations related to Cross Connection and Backflow.
- Coordinates enforcement of the Virginia Uniform Statewide Building Code requirements for point-of-connection protection as well as cross connection requirements within the service area.
- Provides standards, procedures, rules, regulations, and guidelines for the identification and containment of cross connections and backflow risks in accordance with the Virginia Department of Health and the Virginia Uniform Statewide Building Codes.
- Provides clarification of the roles and responsibilities of Loudoun Water, Loudoun County, VDH and the consumer/customer.

The added purpose of this program manual is to educate and assist Loudoun Water employees, customers, and those who work with public water supplies and to encourage users to actively support and implement cross connection prevention for the purpose of protecting our potable water supply. If you have any questions regarding the Cross Connection/Backflow Prevention Program, please contact the Loudoun Water Cross Connection Control & Backflow Prevention Department at **backflow@loudounwater.org.**

Definitions and Acronyms

Air Gap: An air gap is a physical separation between a vessel and the supply pipe and shall be at least 8 inches or twice the influent pipe diameter, whichever is greater. Physical separation must be measured vertically from the lowest end of the potable water outlet to the flood rim of the receiving fixture or vessel into which the potable water discharges. Inlet piping shall be mounted external to the vessel and cannot be installed internally for any reason. Air gaps must be physically visible for annual inspection by Loudoun Water

Annual Backflow Inspection: Consists of an annual inspection of the facilities' mechanical room, backflow prevention methods (air gaps), and testable backflow prevention assemblies to identify cross connections or potential cross connections that could pose a threat to the potable water supply. Inspectors will ensure testable assemblies are up to date and are tested annually by a Virginia Department of Occupation Regulation Certified Backflow Prevention Device Worker as required by law. These inspections may also include isolation recommendations for resolving any internal cross connections of the facility**.**

Atmospheric Vacuum Breaker: A non-testable device having a float-check, usually a ball, which floats to close the air inlet port. The flow of water into the assembly causes the ball to float and close the air inlet port. When the flow of water stops, the ball falls to form a check valve against back-siphonage and at the same time opens the air inlet port to allow air to enter and eliminate the vacuum. A shut-off valve immediately upstream may be an integral part of the device. An atmospheric vacuum breaker is designed to protect against a health hazard (i.e. contaminant) under a back-siphonage condition only. An atmospheric vacuum breaker is also known as the "non-pressure type vacuum breaker".

ASSE: American Society of Sanitary Engineering

Auxiliary Water System: Any secondary water source or system other than the public water distribution system that may be available on a property or in a structure, including but not limited to, ground/well water, rainwater, storage tanks, reclaimed water, process or industrial water etc.

Backflow: The reversal of the normal flow of water or other liquids, mixtures, or substances through the distributing pipes of the Loudoun Water potable water distribution system because of an increase in the pressure to a rate that is higher than the supply pressure.

Backflow Prevention Assembly (BPA): A mechanical unit, designed to control various cross connections and stop the reversal of flow, that includes an inlet and outlet shutoff valve and test cocks to facilitate testing of the assembly. Backflow prevention assemblies include the reduced pressure principle backflow prevention assembly, the double check valve assembly, and the pressure vacuum breaker assembly.

Backflow Prevention Device (BPD): A mechanical unit, designed to control cross connections and stop the reversal of flow, that is not testable because it does not have inlet and outlet shutoff valves or test cocks. A backflow prevention device is not generally designed or constructed to withstand continuous pressure over 12 hours, or to control high hazards. A backflow prevention device generally includes the atmospheric type vacuum breakers and the dual check valve type devices.

Backflow Prevention Method: A condition where backflow is prevented through the use of a mechanical backflow preventer or air gap which eliminates the potential for backflow to the public water system.

Back-Pressure: Any pressure that works against the pressure generated by Loudoun Water. A back pressure occurs when non potable water pressure is greater than potable water pressure. Higher water pressure can be due to elevation differences, high pressure booster pumps, boilers which create high temperatures and pressures.

Back-Siphonage: A reversal of normal flow in system caused by a negative pressure (vacuum or partial vacuum) in the supply piping. When atmospheric pressure is greater than the potable water side, a reversal of flow can take place from the non-potable side. Backflow can happen during that differential pressure and a cross connection provides the link between potable water and non-potable source.

Consumer: A person receiving water for consumption from the Loudoun Water potable water supply

Consumer's water system: Any water system located on the consumer's premises, supplied by or in any manner connected to a waterworks.

Containment: The safeguard against backflow into Loudoun Waters potable water or reclaimed water supply from a consumer's water system by installing an appropriate backflow prevention assembly, backflow prevention device, or backflow elimination method at the service connection (at the meter or curb stop) or downstream of the service connection but before any unprotected takeoffs.

Contaminant: A substance that will impair the quality of the water to a degree that it creates a serious health hazard to the public.

Cross Connection: A temporary or permanent connection between a potable water supply and a non-potable source containing other substances in a manner that, under any circumstances, would allow such substances to enter the potable water system.

Customer: The owner, tenant, consumer, or identified responsible person having a water service or reclaimed account with Loudoun Water, who is responsible for installing, maintaining, and testing required devices/assemblies connected to Loudoun Water's public water system.

Degree of Hazard: The level of health hazard, as derived from an evaluation of the potential risk to public health and the adverse effect upon a potable water system.

Domestic Meter: The measurement device of water consumed by the customer for billing of water and/or sewer usage. The domestic meter is typically located at the downstream end of the water service at the right-of-way line, easement line or inside the structure.

Double Check Valve Assembly: An approved assembly composed of two independently acting check valves, including tightly closing shut-off valves located at each end of the assembly and fitted with properly located test cocks. This assembly shall only be used to protect against a non-health hazard (i.e., a non-pollutant).

DPOR: The Virginia Department of Professional and Occupational Regulation

Finished Water: Water that is introduced into the distribution system of a waterworks and is intended for distribution and consumption.

IPC: International Plumbing Code

Irrigation Meter (Water Only Meter): The measuring device of water consumed by the customer for billing of water usage only.

Isolation: The safeguard against backflow into Loudoun Waters potable water supply from a consumer's water system by installing an appropriate backflow prevention assembly or device or by installing a backflow elimination method at the sources of potential contamination in the consumer's water system. This is also called point of-use isolation.

Non-Potable Water: Any water, including reclaimed water, not meeting the definition of potable water.

Owner: An individual, group of individuals, partnership, firm, association, institution, corporation, governmental entity, or the federal government that supplies or proposes to supply water to any person within the Commonwealth from or by means of any waterworks.

Plumbing Fixtures: Receptacles, devices or appliances that are installed to supply or receive potable water or discharge water or wastewater.

Plumbing System: Water supply and distribution pipes, plumbing fixtures, traps, soil, waste and vent pipes, building drains, building sewers, water-treating and water-using equipment and connection devices and appurtenances that supply potable water to a building or discharge wastewater, and that are located on the property where the building is located.

Point of Use (POU): A backflow preventer installed on the supply line to each system, piece of equipment, appliance, or outlet which isolates it against backflow to other components or outlets of the water distribution system.

Pollution (Pollutant): A foreign substance, that if permitted to get into the public water system, will degrade quality to constitute a moderate 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 effect such water for domestic use.

Potable Water: Water fit for human consumption and domestic use, which is sanitary and normally free of minerals, organic substances, and toxic agents.

Pressure Vacuum Breaker (PVB): An approved, testable, mechanical assembly containing an independently operating loaded check valve and an independently operating loaded air inlet valve located on the discharge side of the check valve. The assembly is to be equipped with properly located test cocks and tightly closing shut-off valves located at each end of the assembly. This assembly is designed to protect against a health hazard (i.e., contaminant or pollutant) under a back-siphonage condition only.

Reclaimed Water: Water resulting from the treatment of domestic, municipal, or industrial wastewater that is suitable for a water reuse that would not otherwise occur; water delivered and used in accordance with Virginia Water Reclamation and Reuse Regulation 9VAC25-740-10 et seq.

Reclaimed Water Consumer's System: Reclaimed water supply and distribution pipes, plumbing fixtures, traps, soil, waste, and vent pipes, building drains, building sewers, reclaimed water-treating and reclaimed water-using equipment and connection devices and appurtenances that supply reclaimed water to a building or discharge wastewater, and that are located on the property where the building is located.

Reclaimed Water Customer: The person or entity having a reclaimed water account with Loudoun Water.

Reduced Pressure Zone Assembly (RPZ): An approved, testable assembly containing a minimum of two independently acting check valves together with a hydraulically operated, mechanically independent pressure differential relief valve located between the two check valves. The unit must include tightly closing shut-off valves located at each end of the assembly, and each assembly shall be fitted with properly located test cocks. This assembly shall meet Virginia Construction Code (IPC) standards.

Secondary Source: When a building's plumbing and industrial process is supplied potable water by Loudoun Water and also incorporates ground/well water, rainwater, storage tanks, reclaimed water, process or industrial water etc. A Loudoun Water approved air gap shall be provided between the building's potable service line and the secondary source or process piping.

Service Connection: The point of delivery of finished water from a waterworks to a consumer's water system, fire protection system, irrigation system, and to all other points where finished water is delivered

through the distribution system to a consumer. Generally, the service connection occurs at the water meter, or at the distribution main if no water meter is installed, or in the case of an owner of both the waterworks and the building supplied, the point of entry into the building. Service connections may be permanent, temporary, or emergency.

Service Line: The pipelines or service piping between the service connection and the building connection.

Service Line Protection: A backflow preventer which is installed on the service line before the first branch to any customer system, equipment, appliance, etc.

Test Report: Consists of detailed test results, performed annually by a DPOR Certified Backflow Prevention Device Worker, that identifies whether the backflow prevention assembly is functioning properly. Test reports must be forwarded to the Loudoun Water Backflow Department for acknowledgement and record that assemblies are in compliance.

Waterworks: A system that serves piped water for human consumption to at least 15 service connections or 25 or more individuals for at least 60 days out of the year. "Waterworks" includes all structures, equipment, and appurtenances used in the storage, collection, purification, treatment, and distribution of potable water except the piping and fixtures inside the building where such water is delivered.

Causes of Backflow

Backflow is the flow through a cross connection from a possible source of contamination back into the drinking water system. There are two types of backflow.

1. **Back-siphonage** – Back-siphonage is caused by reduced or negative pressure in the supply line. The principle causes of back-siphonage are:

    - Line repair or break that is lower than a service point. This will allow a vacuum in the system due to water trying to flow to a lower point in the system.
    - Lowered pressure in water main due to high water withdrawal rate such as firefighting, water main flushing, or water main breaks.
    - Reduced supply main pressure on suction side of a water booster pump.

2. **Backpressure** – Backpressure may occur when a potable water system is connected to a non-potable system and the pressure in the non-potable system exceeds that in the potable system. The principle causes of backpressure are:

    - Booster pumping systems designed without either backflow prevention devices or low-pressure cutoff switches that could drop suction pressure below 20psi.
    - Potable water connections to boilers and other pressure systems without backflow prevention devices.
    - Connections with other systems that may have a higher pressure.
    - Water stored in tanks or plumbing systems that by virtue of their elevation would create pressure sufficient to cause backflow if pressure were lowered in the potable system.

II. Responsibilities

General

Effective cross connection control requires the cooperation of several stakeholders including Loudoun Water, Loudoun County Department of Building and Development, the customer, and the Virginia Department of Health, and Certified Backflow Preventer Installers/Testers.

Loudoun Water (Owner)

The Cross Connection Control Program (CCCP) for Loudoun Water is carried out in accordance with the VDH Waterworks Regulations and will, at a minimum, provide containment at the customer's service connection. The CCCP resides in the Loudoun Water Operation & Maintenance Division under the Director of Water Operations. Individual(s) assigned to this activity full time shall be a designated member(s) of the Cross Connection Backflow department. Individual(s) shall provide overall coordination of the program and shall be responsible for inspections, surveys, maintenance programs, and maintain records.

Loudoun Water has full responsibility for distribution system water quality and for the construction, maintenance, and operation of the water system beginning at the water source and ending at each service connection and/or metered service connection. The VDH Waterworks Regulation mandates and gives authority to Loudoun Water to establish and operate a cross connection control and backflow program consistent with the extent of the system and the type of customer served. Loudoun Water will conduct this responsibility and authority in the following ways:

- Loudoun Water will determine what facilities pose a potential contamination threat to the public water distribution system and ensure proper protection measures are in place.

- Loudoun Water will provide annual routine inspections of commercial/industrial properties, multi-family dwellings backflow prevention assemblies, devices, and methods installed at each service connection. During the inspection, existing cross connection control devices will be inspected to determine if the device has been altered or the protection afforded by it has been bypassed, removed, or made otherwise ineffective.

- Loudoun Water will require annual isolation inspections for any high hazard non-residential locations, where containment protection does not exist.

- Loudoun Water will maintain and keep all backflow method or assembly maintenance records including test records for 10 years as required by the VDH Waterworks Regulations.

- In an event where a pollutant or contaminant were to backflow into the public water system, Loudoun Water shall promptly implement correction actions to confine and eliminate the pollution or contamination.

- Loudoun Water will notify VDH within one business day in the event of a backflow of contaminants into the potable water supply. Loudoun Water will submit a written report by the 10th day of the month following the month during which backflow occurred addressing the incident, its causes and effects, and safeguards required to other action taken.

- Loudoun Water will take positive action to ensure that the water system is adequately protected at all times. Loudoun Water may discontinue the water service to the consumer and water service shall not be restored until the cross connection has been corrected or eliminated.

- Regular notices will be used to provide backflow prevention education to residential consumers and inform them that they are responsible for the testing and maintenance of assemblies on the lawn irrigation systems and fire sprinkler systems.

- At a minimum, all new service connections will be protected with an approved backflow assembly consisting of a double check valve or dual check valve (ASSE #1024).

- Any existing residential customers without a dual check (ASSE #1024) will be assessed during water main replacement projects, or other Loudoun Water projects that could include the installation of dual check valve (ASSE #1024) to the customers service line connection.

- Any existing non-residential customers without containment by an approved backflow assembly, device, or method will be subject to annual inspection for isolation methods.

- As required by the Commonwealth of Virginia/State Board of Health, Waterworks Regulations, Loudoun Water will conduct annual cross connection/backflow prevention inspections of non-residential plumbing systems connected to Loudoun Water's water distribution system. The charge for each inspection can be referenced in Loudoun Waters Rules, Rates, and Regulations.

Consumers

The Customer's responsibility starts at the service connection from the public potable water system and includes the private water systems. The Customer will install, operate, and maintain approved backflow prevention assemblies, devices, methods. The Customer will allow entry during reasonable hours to the Loudoun Water Cross Connection Representative, or designee for the purpose of inspecting backflow prevention assemblies, devices, and methods. Failure, refusal, or inability on the part of the Customer to install, have tested, and maintain required backflow prevention assemblies within 30 days of notification by Loudoun Water shall constitute a violation. Violations may result in discontinuation of Loudoun Water service until the corrective action is completed.

Virginia Department of Health

The Virginia Department of Health (VDH) is responsible for regulating safe drinking water by providing a simple and effective regulatory program for waterworks, adapting to new health concerns in drinking water treatment, and providing a means to improve inadequate waterworks.

The VDH is responsible for approving the Cross Connection Control Program, providing technical assistance, clarification of regulations, and assisting with unique situations.

Loudoun County Department of Building and Development

The Loudoun County Department of Building and Development is responsible for ensuring that all development within the jurisdiction meets the standards of the Virginia Construction Code. The Loudoun County Department of Building and Development has the responsibility of oversight of all phases of construction within Loudoun County. This includes:

- Review and approval of construction and site plans in accordance with Title 36. Housing. Chapter 6. Uniform Statewide Building Code. Article 1. General Provisions. 36.98, the Uniform Statewide Building Code (USBC). This includes enforcement of the Virginia Construction Code and International Plumbing Code for backflow prevention requirements during the building phase. Inspection during the construction phase of new structures, alterations to existing structures, and periodic inspections as required by the Virginia Construction Code.

- Ensure structures identified as having hazardous equipment, systems, or processes are adequately protected, by backflow prevention devices, assemblies, and methods, to prevent contamination or pollution of the public water distribution system.

Backflow Prevention Device/Assembly Installers and Testers

In 2021, VDH updated the Waterworks Regulation requiring person testing and repairing backflow prevention assemblies and backflow prevention devices shall be certified by a Commonwealth of Virginia tradesman certification program (identified by DPOR as Backflow Prevention Device Workers) by January 1, 2023.

- The installer's responsibility is to use approved backflow prevention assemblies installed in accordance with manufacturer's instructions and any additional instructions of the Loudoun Water. A licensed plumber shall perform the backflow prevention device installation.

- A copy of the Backflow Prevention Device Worker (BPD Worker) certificate must be provided to Loudoun Water.

- The BPD Worker is responsible for making competent inspections and for repairing or overhauling backflow prevention assemblies and making reports of such repair to the premise plumbing system owner on forms approved by the Program Manager.

- The BPD Worker shall be equipped with and be competent in the use of all the necessary tools, gauges, manometers, and other equipment necessary to properly test, repair and maintain backflow prevention assemblies.

- The BPD Worker shall not change the design or operational characteristics of an assembly during repair or maintenance without prior written approval of the consumer's premise plumbing system owner and the Program Manager.

- All BPD Workers must use test kits that are certified annually. Loudoun Water does not require the test kit certificate to be submitted, but certification dates are checked and will be followed up on if test sheets are submitted with an expired test kit. If kits are not certified annually, any test performed is deemed void which will require the assembly to be retested and resubmission of the new test sheet to Loudoun Water.

- A failed backflow prevention assembly requires a repair or replacement and retest of the assembly. Failed reports are submitted to Loudoun Water. A failed backflow prevention assembly is considered a violation of the Virginia Waterworks Regulations and Virginia Plumbing Code. All repairs and replacements must be completed within 30 business days.

Organization

- The basic responsibility for the Cross Connection Control Program is in the Loudoun Water Operation & Maintenance Division under the Loudoun Water Manager/Director.

- Individual(s) assigned to this activity full time shall be designated member(s) of the Cross Connection and Backflow Department. Individual(s) shall provide overall coordination of the

program and shall be responsible for and perform the inspections, surveillance and maintenance programs as well as maintain records.

- All new connections to Loudoun Waters potable water system will be inspected for cross connections by the County of Loudoun Plumbing Department prior to service. Loudoun Water will also inspect all new connections on service lines and fire service lines at the time the meter is installed.

- All new water storage tanks that are supplied by Loudoun Water (where potable, reclaim, well/groundwater, industrial or process water is stored) will be required to be inspected and approved by the Cross Connection Department before the meter is installed.

- All new connections to Loudoun Waters potable water system, that also includes an Auxiliary/Secondary Source (reclaimed, well/groundwater, rainwater) will be required to be inspected and approved by the Cross Connection Department before the meter is installed.

- Review of site/utility plans for evaluation and approval shall be coordinated with the County of Loudoun Plumbing Department.

III. Cross Connection Control Practices

Service Line Containment Protection

Loudoun Water has determined that protection can be achieved in many instances under the requirements of the Virginia Construction Code. However, in cases where concerns of potential contamination exist, Loudoun Water must protect the public water distribution system.

Each premise plumbing system will be assessed on a regular basis for cross connection hazards. Assessment may be performed by inspections, interviews, or questionnaires. Interviews may be conducted on site or by phone.

To safeguard the public water distribution system a reduced pressure principle backflow prevention assembly meeting the American Society of Sanitary Engineering (ASSE) Standard 1013 or 1047 will be installed on the service line where one or more of the conditions listed in **Appendix A** exist.

Point-of-use- Isolation Protection

Any premises, residential, commercial, or industrial, where all actual or potential cross connections can be easily correctable at each point-of-use and where the premise plumbing system is not intricate or complex, point-of-use isolation protection by application of appropriate backflow prevention devices or separations may be used in lieu of installing a containment device at the service connection if the following conditions are met:

- The method of protection provided shall be, in the judgment of the Program Manager, the method which best provides protection; and
- The Local Building Official concurs.

All backflow prevention assemblies or backflow elimination methods or backflow prevention devices installed under this section shall be of the approved type and shall comply with the requirements of the USBC.

Air Gaps

Whenever Loudoun Water's potable water or any auxiliary or secondary water source is to be stored in a basin, tank, or reservoir of any kind, an approved Loudoun Water air gap must be provided between the incoming potable supply and the storage vessel.

Air Gaps are a non-mechanical method of backflow prevention that creates a physical separation between a vessel and the supply pipe and shall be at least 8 inches or twice the influent pipe diameter, whichever is greater.

- Physical separation must be measured vertically from the lowest end of the potable water outlet to the flood rim of the receiving fixture or vessel into which the potable water discharges.
- Inlet piping shall be mounted external to the vessel and cannot be installed internally for any reason.
- Air gaps must be physically visible for annual inspection by Loudoun Water staff.

Degree of Hazard

The VDH Waterworks Regulations states an owner's cross connection control program shall ensure complete assessments of every consumer's water system and shall determine both the degree of hazard and the appropriateness of existing safeguards to prevent contamination from cross connections and backflow. A full list of facilities that are required by VDH and Loudoun Water to install a backflow prevention assembly or backflow elimination method can be found in Appendix A.

Loudoun Water shall determine the appropriate backflow prevention assembly, device, or method based on the degree of hazard.

- **High Hazard**- The contaminant would be toxic, poisonous, noxious, unhealthy, or of unknown quality.
    - A health hazard would exist.
    - The contaminant would disrupt the service of piped water for human consumption.
    - Backflow would be by either backpressure or backsiphonage.
    - Examples- Lawn irrigations, fire sprinkler systems with chemical additives or antifreeze, sewage, used water, non-potable water, auxiliary water systems, and mixtures of water and other liquids, gases, or other chemicals.

- **Low Hazard-** The pollutant would only degrade the quality of water aesthetically or impair the usefulness of the water.
    - A health hazard would not exist.
    - The pollutant would not disrupt service of piped water for human consumption.
    - Backflow would only occur by backsiphonage.
    - Examples- coffee machines, non-carbonated beverage dispensers, and residential fire sprinkler systems constructed of materials designed for potable water flow.

IV. Backflow Device and Assembly Requirements

Backflow Prevention Devices and Assemblies

A wide variety of devices exist that can be used to prevent back siphonage and back pressure from adding contaminated fluids or gases into a potable water supply. The selection of the proper devices is mainly based on the degree of hazard posed by the cross connection, other considerations are based on pipe sizing, location, and the need to have the assembly tested to ensure that proper protection is being maintained. A description of approved Backflow Prevention Devices and Assemblies can be found in Appendix D.

Assembly Testing Requirements

Mechanical backflow preventers have internal seals, springs and moving parts that are subject to fouling, wear, or fatigue. Mechanical backflow preventers and air gaps can be bypassed, therefore all testable backflow preventers must be tested annually to ensure they are functioning properly. A visual check of air gaps is sufficient, but mechanical backflow preventers must be tested with properly calibrated gauge equipment.

Loudoun Water requires that all testable assemblies be tested after initial installation, immediately after repairs or relocation, and annually thereafter according to Virginia Uniform Statewide Building Code, this includes residential irrigation assemblies; commercial service, fire, reclaimed, and irrigation assemblies.

> *13VAC5-63-530, which incorporates the International Property Maintenance Code into the USBC, requires testing of RPZ assemblies, double check valve assemblies, double check detector backflow assemblies, and pressure vacuum breaker assemblies after initial installation, immediately after repairs or relocation, and annually thereafter.*

Starting January 1, 2023, persons testing and repairing backflow prevention assemblies and backflow prevention devices shall be certified by a Commonwealth of Virginia tradesman certification program (identified by Department of Professional Occupation and Regulation - DPOR as backflow prevention device workers).

Test Report Requirements

Test reports must be filed with Loudoun Water's Cross Connection/Backflow Department (backflow@loudounwater.org), as a condition of the initial building occupancy, and annually thereafter. It is the responsibility of the Contractor, tester, or testing company to ensure backflow assembly test reports are completed and properly submitted in a timely manner. Where an assembly is found to be less than fully effective and in need of repair, all failed test reports shall be submitted as well as passed test reports after repairs have been made. Tests completed by someone other than a DPOR Backflow Prevention Device Worker, or tests that are incomplete or illegible will not be accepted. A copy of Loudoun Water's test report can be found in
Appendix C, and at www.loudounwater.org/residential-customers/cross-connection-backflow.

Test Gauge Requirements

Backflow Assembly Test Gauges must be calibrated and certified at least once annually and cannot exceed 12 months between calibration. If an issue is suspected between certifications, the gauge should be inspected, and a backflow calibration may need to be done before the annual certification is required. Loudoun Water does not require the test kit certificate to be submitted to them, but certification dates are checked and will be followed up on if test sheets are submitted with an expired test kit. If kits are not

certified annually, any test performed is deemed void which will require the device to be retested and resubmission of the new test sheet to Loudoun Water.

Device/Assembly Installation

Any backflow prevention assembly or backflow prevention device shall be installed in accordance with the USBC and the manufacturer's instructions. Owners shall not allow the installation of backflow prevention devices or backflow prevention assemblies with openings, outlets, or vents that are designed to operate or open during backflow prevention:

- In areas subject to flooding or in pits,
- In areas with atmospheric conditions that represent a contamination threat to the potable water supply; and,
- In such a manner as to be able to be bypassed.

V. Deficiencies

Notice of Violation

Where an assembly is found to be less than fully effective, a "1st Notice of Violation" letter will be issued and requires the customer to comply with Loudoun Water and the Virginia Department of Health Waterworks Regulations (12VAC5-590-580-630). Backflow assemblies shall be tested and maintained to satisfy these regulatory requirements within thirty (30) days of the date the Notice of Violation was issued. After 30 days, the inspector should check in with the customer and confirm required corrections have been made. A copy of this Violation Letter can be found in **Appendix B**.

2nd Notice of Violation

If the customer continues to remain in an out of compliance status, the inspector will then give the customer Loudoun Water's "2nd Notice of Violation" letter. This letter will again outline the reason for the customer being out of compliance, and what needs to be done to resolve the issue within 7 days. If a customer does not conform with the 2nd Notice of Violation, a follow-up with the Supervisor should be held. If the location falls into a High Hazard category, possible further investigation will need to be performed by the Supervisor/Manager of CCBF. Failure to comply with these regulations mandates that Loudoun Water report "non-compliant" status to Loudoun County Health Department, the Fire Marshalls Office for Loudoun County and could also result in an interruption of service if deemed necessary. A copy of this Violation Letter can be found in **Appendix B**.

Containment Protection Deficiency Notice

If the customer is out of compliance for a missing containment backflow prevention assembly within their building (at the potable service point of entry or prior to high hazard fixtures or systems) the inspector shall provide the customer with a Loudoun Water Containment Deficiency Notice. This notice will notify the customer of the requirements pursuant to the Loudoun Water Cross Connection Control Program and Virginia Department of Health regulations (12VAC 5-590-610). The customer must have approved backflow prevention assembly installed inspected by a certified tester and tested annually thereafter. Test results must be submitted to Loudoun Water. A copy of this Violation Letter can be found in **Appendix B**.

Isolation Protection Deficiency Notice

If the customer is out of compliance for an Isolation Device within the customers building, the inspector shall provide them with a Loudoun Water Isolation Deficiency Notice recommending options to resolve

any discrepancies that the customer may not be aware of. A copy of this Violation Letter can be found in Appendix B.

VI. Auxiliary Cross Connection Hazards

Booster or Fire Pumps

Premises having booster pumps or fire pumps connected to the waterworks *shall have the pumps equipped with a pressure sensing device to shut off or regulate the flow to prevent a reduction of pump suction line pressure to less than 20 psi.*

New commercial facilities that include booster/fire pumps, shall provide information to Loudoun Water that a pressure sensing device is in place (physical switch or program logic). During annual backflow inspections, the Loudoun Water Inspector will ensure that protection measures remain in place and are in proper working condition.

Residential Irrigation Systems

Residential irrigation system BPA's may be located at the point of connection between the premise plumbing and the irrigation system, but before any irrigation system outlets, controls, or openings. This isolation in lieu of containment method of protection is permitted so that the customer can be protected from potential contamination by their own irrigation system. Under this scenario, the irrigation BPA serves as the required containment BPA and is therefore subject to all regulatory guidance directed by this program.

Lawn irrigation systems require a residential or commercial plumbing/gas permit as determined as defined by the Virginia Construction Code. Lawn irrigation systems also require the installation of a backflow prevention assembly in accordance with the Virginia Construction Code and annual testing upon installation.

Secondary Sources

Whenever a building's plumbing or industrial process piping is supplied with potable water from Loudoun Water and incorporates a secondary source that includes, but are not limited to, *ground/well water, rainwater, storage tanks/reservoirs, reclaimed water, process, or industrial water, etc.* an approved Loudoun Water air gap shall be provided between the building's potable service line and the secondary source or process piping.

Except in the case of fire suppression systems, no pipe connected with the mains of Loudoun Water shall be connected with pipes supplied with water from any other source. In the case of fire suppression systems with redundant sources, reduced pressure zone (RPZ) assemblies will be considered by Loudoun Water for approval.

Premises with a secondary water system requesting a new service connection or reconnection to the waterworks must be assessed by onsite inspection for cross connection hazards and the appropriate separation installed, inspected, and operational prior to making the service connection.

Premises with a secondary water system, may, upon approval of the Program Manager, maintain the auxiliary water system on the premises if a separation from the consumer's premise plumbing is provided and maintained and access is granted for inspections.

Whenever Loudoun Water's potable water is to be stored in a basin, tank, or reservoir of any kind an approved Loudoun Water air gap must be provided between the incoming potable supply and the storage vessel. See section "Air Gaps" for specific details regarding the installation requirements of an air gap and its associated piping.

Fire Hydrant Meters, Tank Trucks, and Potable Water Tanks

Loudoun Water allows the use of fire hydrants when access to the public water distribution system through a conventional metered connection is unsuitable or impractical.

Hydrant meters are supplied by Loudoun Water to the customer with check valves installed. 3" meters are supplied with single check valve assemblies and ¾"meters are supplied with a dual check assemblies. Due to the potential unmonitored uses of the larger 3" water meter and minimal protection provided with a single check valve, the customer is required to install a testable RPZ to the meter and is responsible for having it tested within 2-4 days by a DPOR Certified tester. BPA test sheets must be submitted to Loudoun Water via online form on our website or by email to backflow@loudounwater.org. This will ensure that the potable water system is protected against undesired backflow of chemicals and other hazardous materials. After the meter has been released, Loudoun Water will visit the associated hydrant with the meter for an inspection to ensure that the RPZ has been installed, proper support/blocking is in place, and confirm that the assembly has been tested. If a customer fails to test the RPZ in a timely fashion, the meter can be confiscated.

- After the RPZ has been tested it should remain connected to the water meter and remain an assembly until its use is no longer needed.
- As long as the RPZ remains connected to the meter, the meter/RPZ can be removed daily from the fire hydrant if needed for various reasons. Under this scenario, the RPZ is only required to be tested on an annual basis.
- If the RPZ is disconnected from the meter for any reason, the device will be required to be retested by a DPOR Certified tester upon reinstallation and anytime thereafter that the meter and RPZ are separated.
- RPZ will need to be disconnected prior to annual calibration.

If a fire hydrant meter is to be used to fill a tank truck, portable container, basin, or reservoir of any kind, an approved Loudoun Water air gap must be installed. The air gap must be permanently mounted to the vessel and provide a physical separation between the vessel and the supply pipe of at least 8 inches or twice the influent pipe diameter, whichever is greater.

- Physical separation must be measured vertically between the lowest end of the discharge pipe and the flood level rim of the receiving fixture or vessel into which the water discharges.
- Inlet piping shall be mounted external to the vessel and cannot be installed internally for any reason.
- Air gaps must be physically visible for inspection by Loudoun Water.
- The filling of tanks and reservoirs by hose or fire hose hanging loosely is prohibited.

VII. Reclaimed Water

Overview

Loudoun Water provides high quality non-potable water to consumers within the Loudoun Water service area for approved reuse through its Water Reclamation and Reuse Program. The Loudoun Water Cross

Connection Control Program is in accordance with the Virginia Administrative Code 9VAC25-740-100 et. seq that requires a reclaimed water agent, as a condition for issuance and continued use of the permit, establish a cross connection control program.

The Cross Connection Control Program uses a containment approach to a reclaimed water consumer's system to achieve the desired degree of protection. To ensure containment of the reclaimed water supply, reclaimed service line protection is required for all services with outdoor meters 1.5-inch and larger, and at all services with indoor meters. The back flow prevention assembly must be certified by ASSE. Installation and testing shall be in accordance with the *International Plumbing Code* (currently including Sections 312.9.2, 608.2, 608.3), the *Virginia Waterworks Regulations* Section 12VAC5 590-630.
Each reclaimed water service line to any facility must be protected by a reduced pressure principle backflow prevention assembly (RPZ) at the service point of entry. Reclaimed Service piping shall never be directly connected to potable service piping. Appropriate air gaps must be in place if a potable source and a secondary source are required for operation.

Cross connection and backflow prevention design criteria shall be in accordance with Virginia State Water Control Board Water Reclamation and Reuse Regulation 9VAC25-740-110 B.2.

Backflow Testing Requirements

Inspections and testing of the reclaimed system consumer's backflow preventers shall be completed in accordance with the Virginia Uniform Statewide Building Code (USBC), International Plumbing Code (IPC), and in accordance with the requirements of this manual. Site visits shall be conducted on an annual basis by Loudoun Water to all reclaimed water consumer's facilities. The purpose of these site visits shall be to verify the consumer's system is operating in accordance with 9VAC25-740 and their service agreement. The site visit shall include, at a minimum, a visual inspection of all reclaimed backflow assemblies, air gaps, water outlets and all reclaimed water piping.

Refer to section "IV- Backflow Device and Assembly Requirements and Procedures" for further details on backflow devices/assemblies, testing requirements, and installation.

VIII. Plan Reviews /Acceptance

Plumbing Plan Review

All plumbing plans and specifications for new utility construction as well as all industrial and commercial building permits, except those for interior work with no plumbing, shall be reviewed and inspected by the County of Loudoun Plumbing Department. At this time, backflow prevention requirements and determinations of possible cross connection hazards in accordance with this program should be decided by the County. The Loudoun County Plumbing department will only review plans interior to the building after the customers water meter, all exterior plumbing/piping prior to the customers meter will be reviewed and inspected by Loudoun Water.

Any commercial facility that was constructed and approved without containment backflow protection on their potable water supply shall conform to current Loudoun Water requirements with the installation of an appropriate backflow assembly in the event where the customer would modify plumbing requiring a Loudoun County plumbing permit. Loudoun Water must be notified of changes to ensure proper placement of backflow assemblies, and to allow data to be collected from each assembly to be entered for

annual backflow inspections thereafter. When new assemblies are installed, it is required for the customer to have the device tested annually by a DPOR Certified Backflow Prevention Device Worker and have test reports submitted to Loudoun Water.

Secondary Source Review

Beginning January 1 ,2023 all premises that utilize a secondary source are required to submit applicable plumbing plans during the plan review process to the Loudoun Water Cross Connection/Backflow Department, to ensure proper protection of the Loudoun Water potable water system. Secondary sources include, but are not limited to, ground/well water, rainwater, storage tanks/reservoirs, reclaimed water, process, or industrial water etc. Plan details specific to air gaps of all storage tank/reservoirs and proposed backflow assemblies are desired. In the event plumbing plans are not available, a delay in the issuance of the construction permit and/or meters may occur.

Any facility constructed prior to June 1, 2022, that includes storage tanks without air gaps are exempt from air gap requirements and cross connections between potable and reclaimed water supplies downstream of the customers RPZ. In the event where the customer would modify plumbing requiring a Loudoun County plumbing permit such as upgrading/modifying interior piping or adding a secondary source connection to a system that has no air gaps, the exemption will become void and the customer will be required to conform to current Loudoun Water standards and install approved air gaps to all tanks, and/or sever any direct connections between their potable supply and a secondary source piping.

New Facility Acceptance

A Loudoun Water Cross Connection and Backflow Inspector will visit all new industrial and commercial facilities for inspection of backflow prevention assemblies on potable service line, and fire service line connections when the permanent water meter has been installed. At this time, the Inspector will collect assembly test sheets and gather data on all containment protection assemblies within the premises (# of assemblies, locations, model #'s, serial #'s, size, ASSE #'s) to be added to Loudoun Water's record management system for record keeping and inspection purposes.

Secondary Source Facility Acceptance

A Loudoun Water Cross Connection and Backflow Inspector will visit all new industrial and commercial facilities that utilize a secondary source or require a storage tank/vessel of any kind for inspection of backflow prevention assemblies/methods on the potable service line, reclaimed and fire service line connections prior to the permanent water meter installation. At this time the inspector will confirm proper containment protection of the potable water system is in place, verify all air gap requirements have been met between any potable and non-potable connections and on any applicable storage tanks. Following approval from the Cross Connection and Backflow Department, the potable water meter release will be initiated.

After meters have been installed, a Cross Connection and Backflow Inspector will make a return visit to follow its New Facility Acceptance procedures.

IX. Recordkeeping

Loudoun Water's facilities management and work order system is currently being used to track backflow prevention devices, assemblies, methods, and history. An inventory record for each assembly includes the location, type of device, serial number, and history of all inspections and tests. The original hard copy of all tests and all other relevant records such as surveys, questionnaire distribution lists, and questionnaire responses are maintained in a file and kept for a period of at least 10 years.

APPENDICES

Appendix A- Hazardous Industry List

A. A substance is handled in such a manner as to create an actual or potential hazard to a waterworks (this shall include premises having sources or systems containing process fluids or waters originating from a waterworks which are no longer under the control of the owner)
B. There exists internal cross connections that, in the judgment of the owner or the department, may not be easily correctable or have intricate or complex plumbing arrangements that make it impracticable to determine whether or not cross connections exist;
C. There are security requirements or other prohibitions or restrictions that prevent the assessment of all potential cross connections that may impair the quality of the water delivered.
D. There is a repeated history of cross connections being established or reestablished.
E. There are fire protection systems, lawn sprinkler systems, or irrigation systems.
F. The owner or department can show that a potential cross connection hazard exists.
G. Booster pumps or fire pumps connected to the waterworks.
H. Hospitals, mortuaries, clinics, veterinary establishments, nursing homes, and medical buildings.
I. Laboratories.
J. Piers, docks, and waterfront facilities.
K. Sewage treatment plants, sewage pumping stations, or storm water pumping stations.
L. Food and beverage processing plants.
M. Chemical plants, dyeing plants, and pharmaceutical plants.
N. Metal plating industries.
O. Petroleum or natural-gas processing or storage plants.
P. Radioactive materials processing plants or nuclear reactors.
Q. Car washes and laundry.
R. Buildings with commercial, industrial, or institutional occupants served through a master meter.
S. Water loading facilities.
T. Slaughter houses and poultry processing plants.
U. Farms where the water is used for other than household purposes.
V. Commercial greenhouses and nurseries.
W. Health clubs with swimming pools, therapeutic baths, hot tubs, or saunas.
X. Paper and paper-product plants and printing plants.
Y. Pesticide or exterminating companies and their vehicles with storage or mixing tanks.
Z. Facilities that blend, store, package, transport, or treat chemicals, and their related vehicles.
AA. Schools or colleges with laboratory facilities.
BB. Highrise buildings (four or more stories)
CC. Multiuse commercial, office or warehouse facilities; and
DD. Others specified by the owner or the department when reasonable cause can be shown for a potential backflow or cross connection hazard.

Appendix B- Violation and Deficiency Forms

- *1st Notice of Violation*
- *2nd Notice of Violation*
- *Containment Protection Deficiency Notice*
- *Isolation Protection Deficiency Notice*

LOUDOUN WATER

WWW.LOUDOUNWATER.ORG

PO Box 4000 | 44865 Loudoun Water Way | Ashburn, VA 20146
TEL 571.291.7700 | FAX 571.223.2910

NOTICE OF VIOLATION - BACKFLOW PREVENTION ASSEMBLIES

Business Name: _____

Address: _____

_____

Attention: _____

Fire Line Backflow Prevention Device S/N # _____

Potable Water Service Line Backflow Prevention Device S/N # _____

Irrigation Backflow Prevention Device S/N #_____

Other S/N # _____

Dear Property Owner or Tenant,

On _____, a Loudoun Water Cross Connection/Backflow Inspector conducted an Annual Backflow Prevention and Cross Connection Inspection of the fore mentioned address. Our Inspection indicated that the Backflow Prevention Assemblies listed above were found in a non-compliance status, not being tested within the last year.

This "Notice of Violation" requires you to comply with Loudoun Water and the Virginia Department of Health Waterworks Regulations (12VAC5-590-600). Please have these backflow assemblies tested and maintained to satisfy these regulatory requirements within thirty (30) days of the date of this letter. Failure to comply with these regulations mandates that Loudoun Water report your "non-compliant" status to Loudoun County Health Department, and the Fire Marshalls Office for Loudoun County.

Device's must be inspected by a certified tester and test results must be emailed to backflow@loudounwater.org or mailed to: Loudoun Water, Attn: Cross Connection & Backflow Prevention, PO Box 4000, 44865 Loudoun Water Way, Ashburn, VA 20147.

For more information regarding the Loudoun Water Cross Connection Program please visit our website https://www.loudounwater.org/residential-customers/cross-connection-backflow

Thank you for your prompt attention to this important requirement.

Cross Connection Inspection Hazard Code (Circle One): High / Low

Inspector: _____

Inspector's Phone: _____

LOUDOUN WATER

WWW.LOUDOUNWATER.ORG

PO Box 4000 | 44865 Loudoun Water Way | Ashburn, VA 20146
TEL 571.291.7700 | FAX 571.223.2910

2nd NOTICE OF VIOLATION - BACKFLOW PREVENTION ASSEMBLIES

Business Name: _____

Address: _____

_____

Attention: _____

Fire Line Backflow Prevention Device S/N # _____

Potable Water Service Line Backflow Prevention Device S/N # _____

Irrigation Backflow Prevention Device S/N #_____

Other S/N # _____

Dear Property Owner or Tenant,

On _____, a Loudoun Water Cross Connection/Backflow Inspector conducted an Annual Backflow Prevention and Cross Connection Inspection of the fore mentioned address. Our Inspections indicates that the following Backflow Prevention Assemblies were found in a non-compliance status, not being tested within the last year.

This "2nd Notice of Violation" requires you to comply with Loudoun Water and the Virginia Department of Health Waterworks Regulations (12VAC5-590-600). Please have these backflow assemblies tested and maintained to satisfy these regulatory requirements within seven (7) days of the date of this letter. Failure to comply with these regulations mandates that Loudoun Water report your "non-compliant" status infraction to the Loudoun County Health Department, and the Fire Marshalls Office for Loudoun County. Continued failure to comply with these regulations could result in Loudoun Water interrupting your water service or legal recourse through our attorney office.

Device's must be inspected by a certified tester and test results must be emailed to backflow@loudounwater.org or mailed to: Loudoun Water, Attn: Cross Connection & Backflow Prevention, PO Box 4000, 44865 Loudoun Water Way, Ashburn, VA 20147.

For more information regarding the Loudoun Water Cross Connection Program please visit our website https://www.loudounwater.org/residential-customers/cross-connection-backflow

Thank you for your prompt attention to this important requirement.

Cross Connection Inspection Hazard Code (Circle One): High / Low

Inspector: _____

Inspector's Phone: _____

LOUDOUN WATER

WWW.LOUDOUNWATER.ORG

PO Box 4000 | 44865 Loudoun Water Way | Ashburn, VA 20146
TEL 571.291.7700 | FAX 571.223.2910

Containment Protection Deficiency Notice

Business Name: _____

Address: _____

_____

Attention: _____

Dear Property Owner or Tenant,

On _____, a Loudoun Water Cross Connection/Backflow Inspector conducted a Backflow Prevention and Cross Connection Inspection of the fore mentioned address. During the inspection a need for the installation of an approved Backflow Prevention Assembly on the water service at your property listed above, pursuant to the Loudoun Water Cross Connection Control Program and Virginia Department of Health regulations (12VAC 5-590-610). Failure to comply with these regulations mandates that Loudoun Water report your non-compliant status infraction to the Loudoun County Health Department, and the Fire Marshalls Office for Loudoun County. To avoid further action, please arrange to have a Backflow Prevention Device properly installed on the water service at your property as soon as possible.

An approved backflow prevention assembly must be installed on the Potable Water/Fire service line to comply with Virginia Department of Health Waterworks Regulations (12VAC5-590-630).

Device's must be inspected by a certified tester and tested annually thereafter. Test results must be emailed to backflow@loudounwater.org or mailed to: Loudoun Water, Attn: Cross Connection & Backflow Prevention, PO Box 4000, 44865 Loudoun Water Way, Ashburn, VA 20147.

Recommended Location-_____

Recommended Device-_____

Cross Connection Inspection Hazard Code (Circle One): High / Low

Please have installation and testing of the backflow prevention assembly completed within thirty (30) days of the date of this letter. If you have any questions please contact backflow@loudounwater.org

Thank you for your prompt attention to this important requirement.

Inspector: _____

Inspector's Phone: _____

LOUDOUN WATER

WWW.LOUDOUNWATER.ORG

PO Box 4000 | 44865 Loudoun Water Way | Ashburn, VA 20146
TEL 571.291.7700 | FAX 571.223.2910

Isolation Protection Deficiency Notice

Business Name: _____

Address: _____

_____

Attention: _____

Dear Property Owner or Tenant,

On _____, a Loudoun Water Cross Connection/Backflow Inspector conducted an Annual Backflow Prevention and Cross Connection Inspection of the fore mentioned address. During the inspection a need for the installation of an Isolation Backflow Preventer on an interior fixture inside your property was identified. An isolation backflow preventer is a device installed on the supply line to each system, piece of equipment, appliance, or outlet which isolates it against backflow to other components and protects your properties internal drinking water from hazards used downstream of your containment backflow device. The International Plumbing Code 608.2-3 requires the following:

*"**608.2 Plumbing Fixtures**-The supply lines and fittings for plumbing fixtures shall be installed so as to prevent backflow. Plumbing fixture fittings shall provide backflow protection in accordance with ASME A112.18.1/CSA B125.1. "*
*"**608.3 Devices, appurtenances, appliances and apparatus**- Devices, appurtenances, appliances and apparatus intended to serve some special function, such as sterilization, distillation, processing, cooling, or storage of ice or foods, and that connect to the water supply system, shall be provided with protection against backflow and contamination of the water supply system."*

Isolation protection is not enforced my Loudoun Water, but out of concern for potential hazards to your properties internal plumbing and drinking water it is recommended that you the install appropriate backflow preventers to the identified connections below.

Isolation Deficiencies:

_____

_____

_____

_____

_____

_____

Inspector: _____

Inspector's Phone: _____

Appendix C- CCBF Assembly Inspection Test Form

LOUDOUN WATER
44865 LOUDOUN WATER WAY, ASHBURN VA 20147
Customer Relations: (571)291-7880
Website: www.loudounwater.org, Email: backflow@loudounwater.org

CROSS-CONNECTION CONTROL & BACKFLOW PREVENTION ASSEMBLY INSPECTION TEST REPORT

☐ PASS ☐ FAIL

NOTE: ALL REPAIRS AND REPLACEMENTS SHALL BE COMPLETED WITHIN 10 – 15 BUSINESS DAYS

FAILED BACKFLOW PREVENTER ASSEMBLY REQUIRES A REPAIR OR REPLACEMENT AND A RETEST OF THE ASSEMBLY. FAILED REPORTS ARE SUBMITTED TO LOUDOUN WATER. A FAILED BACKFLOW PREVENTER ASSEMBLY IS CONSIDERED A NON-COMPLIANCE OF THE VIRGINIA WATERWORKS REGULATIONS AND THE VIRGINIA PLUMBING CODE.

☐ ANNUAL TEST ☐ NEW CONSTRUCTION ☐ RE-TEST

CUSTOMER/BUSINESS NAME & INFORMATION	
Customer Name:	
Property Address: (Number & Street, City, State, Zip Code)	
Contact Name:	**Email Address:**
DEVICE INFORMATION	
Location of Device:	**Is the device a new assembly?** ☐ **Yes** ☐ **No** **Serial Number of (Old) Replaced Assembly:**
Type of Inspection: ☐ **Residential** ☐ **Commercial** ☐ **Multi Family Complex**	**Type of Service:** ☐ **Service Line** ☐ **Fire Line** ☐ **Irrigation** ☐ **Residential Fire Sprinkler** **Other:**
TYPE OF ASSEMBLY: ☐ **REDUCED PRESSURE ZONE** ☐ **DOUBLE GATE DOUBLE CHECK** ☐ **PRESSURE VACUUM BREAKER** ☐ **SPILL-PROOF VACUUM BREAKER**	
Manufacturer of Device:	**Model Number of Device:**
Serial Number of Device:	**Size of Device:**
Comments:	
Date:	**Line Pressure at Time of Test** **PSI**

	RPZ- REDUCED PRESSURE ASSEMBLY			PVB – PRESSURE VACUUM BREAKER SPILL-PROOF VACUUM BREAKER AIR INLET
	DGDC–DOUBLE GATE DOUBLE CHECK VALVE ASSEMBLY		PRESSURE DIFFERENTIAL RELIEF VALVE	
	CHECK VALVE #1	CHECK VALVE #2		
INSPECTION & TEST GAUGE MEASUREMENTS	**Static PSID** **Closed Tight** **Leaked**	**Static PSID** **Closed Tight** **Leaked**	**Open at PSID** **Did Not Open**	**Open at PSID** **Did Not Open** **Check Valve Held at PSID** **Leaked**

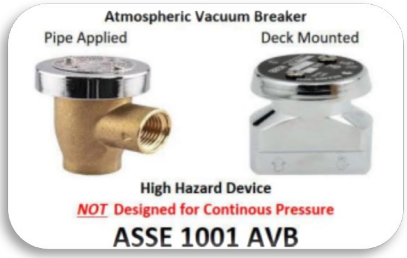
COMPANY & TESTER INFORMATION		
CERTIFIED TESTER	**Tester Name:**	**Tester Telephone:**
	Company:	**Company Telephone:**
	Email Address:	**Tester Certification No:**
	Test Kit Serial No:	**Calibration Date:**

CERTIFICATION STATEMENT

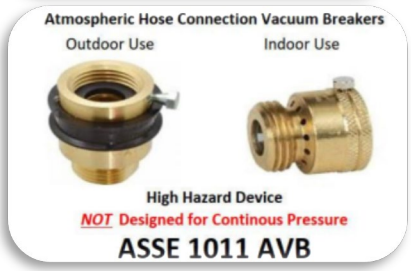
By checking this box and sending this backflow assembly test report to Loudoun Water, I hereby certify that I am familiar with the information contained in this form and that to the best of my knowledge and belief, such information is true, complete, and correct at the time of this test.

Appendix D- Backflow Prevention Devices and Assemblies

- *Atmospheric Vacuum Breakers (AVB)* are mechanical type devices that when installed correctly can protect against back siphonage from occurring. These types of devices must never be utilized to protect against back pressure conditions. AVB's cannot be tested and must be at least 6 inches higher than the existing downstream outlet.



- *Hose Bib Vacuum Breakers* are mechanical devices that are a specialized application of the AVB. Bose bib vacuum breakers are used to prevent back siphonage and generally connected to hose supplied outlets such as garden hoses, slop sink hoses, spray outlets, etc.



- *Residential Dual Check Valves (RDC)* are mechanical devices consisting of two independently acting, spring loaded check valves. Dual check valves protect against backpressure and back siphonage but should be used to isolate low hazard applications and is intended for use with service connections to single family homes.

- *Pressure Vacuum Breakers (PVB)* are mechanical devices that consist of a check device or check valve and an air inlet vented to atmosphere. PVB's used in Low Hazard applications to prevent back siphonage from occurring, these devices do not protect against back pressure under any condition. These devices may be used under constant pressure, installed 6-12 inches higher than the existing downstream outlet, and can be tested for proper protection.

- *Double Check Valves (DC)* are mechanical devices composed of two single independently acting check valves to prevent back siphonage and back pressure from occurring. Double check valves can be used under continuous pressure and are only to be used in Low Hazard installations.

- *Reduced-Pressure Principle Assemblies (RPZ)* are mechanical devices that consists of two independently acting, spring-loaded check valves with a hydraulically operating, mechanically independent, spring-loaded pressure differential relief valve between the check valves and below the first check valve. It includes shutoff valves at each end of the assembly and is equipped with test cocks. An RPZ is effective against backpressure backflow and backsiphonage and may be used to isolate low and high hazards.