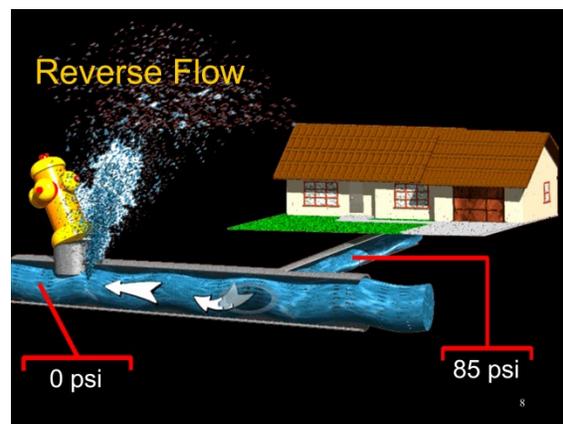
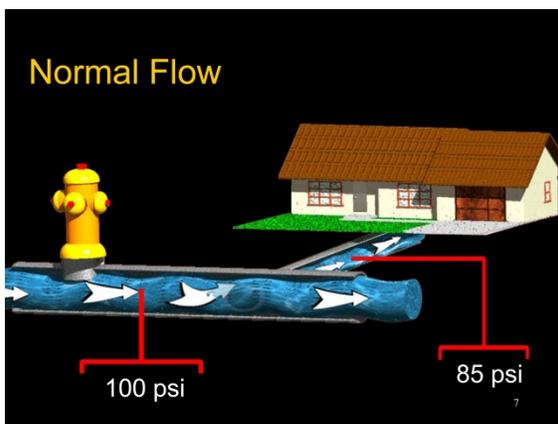


# Backflow Prevention Frequently Asked Questions (FAQ's)



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1. **Why does the James City Service Authority (JCSA) have a Backflow Prevention and Cross Connection Control Program?** First and foremost because we want to ensure that our water distribution system remains safe from harmful substances. It is also required by the Virginia Department of Health's (VDH) Waterworks Regulations. We, as your water system operator, are required to have this program as a condition for the issuance of our water system operator's license.
2. **What is a cross-connection?** A cross-connection is any temporary or permanent connection between a public water system or consumer's potable (i.e., drinking) water system and any source or system containing nonpotable water or other substances. An example is the piping between a public water system or consumer's potable water system and an auxiliary water system, cooling system, well, or irrigation system.
3. **What is backflow?** Backflow is the undesirable reversal of flow of nonpotable water or other substances through a cross-connection and into the piping of a public water system or consumer's potable water system. There are two types of backflow; [backpressure](#) and [backsiphonage](#).



4. **What is backpressure?** Backpressure is backflow caused by a downstream pressure that is greater than the upstream or supply pressure in a public water system or consumer's potable water system. Backpressure (i.e., downstream pressure that is greater than the potable water supply pressure) can result from an increase in downstream pressure, a reduction in the potable water supply pressure, or a combination of both. Increases in downstream pressure can be created by pumps, temperature increases in boilers, etc. Reductions in potable water supply pressure occur whenever the amount of water being used exceeds the amount of water being supplied, such as during water line flushing, firefighting, or breaks in water mains.
5. **What is backsiphonage?** Backsiphonage is backflow caused by a negative pressure (i.e., a vacuum or partial vacuum) in a public water system or consumer's potable water system. The effect is similar to drinking water through a straw. Backsiphonage can occur when there is a stoppage of water supply due to nearby firefighting, a break in a water main, routine maintenance flushing, or any other situation that causes a significant loss in water system pressure.

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- 6. Why do water system operators need to control backflow?** Backflow into a public water system can pollute or contaminate the water in that system (i.e., backflow into a public water system can make the water in that system unusable or unsafe to drink), and each water supplier has a responsibility to provide water that is safe to drink under all foreseeable circumstances. Furthermore, consumers generally have absolute faith that water delivered to them through a public water system is always safe to drink. For these reasons, each water supplier must take reasonable precautions to protect its public water system against backflow.
- 7. Are all residential homes required to have backflow assemblies?** Residential homes that have irrigation systems, fire sprinkler systems, waterfront facilities such as docks or piers, and emergency backup basement sump pumps that utilize the public water supply as a means to power the sump pump are required to have backflow assemblies on those systems.
- 8. Why are irrigation systems considered to be hazardous to the water system?** Irrigation systems include but are not limited to agricultural, residential, and commercial applications. The VDH classifies lawn sprinkler systems and irrigation systems as a high hazard for several reasons. Sprinklers, bubbler outlets, emitters, and other equipment are exposed to substances such as fertilizers, fecal material from pets or other animals, pesticides, and other chemical and biological contaminants. Sprinklers may remain submerged under water after use or storms. Should the water system pressure suddenly decrease, such as in the case of a water main break, line flushing, or during a major fire involving multiple fire hydrants, these harmful substances can be back-siphoned into the water distribution system. They may be subject to various on-site conditions such as additional water supplies, chemical injection, booster pumps, and elevation changes. All of these conditions must be considered when determining backflow protection. Some hazards relating to irrigation systems are:
1. **Fertilizers:** Ammonia salts, ammonia gas, phosphates, potassium salts.
  2. **Herbicides:** 2,4-D, dinitrophenol, 2,4,5-T, T-pentachlorophenol, sodium chlorate, borax, sodium arsenate, methyl bromide.
  3. **Pesticides:** TDE, BHC, lindane, TEPP, parathion, malathion, nicotine, MH, and others.
  4. **Fecal matter:** Animal (domestic and non-domestic).
- 9. What type of backflow prevention assemblies are allowed in irrigation systems?** For those irrigation systems connected to the JCSA potable water system, the appropriate protection is a Reduced Pressure Principle (RP) backflow prevention assembly. A Pressure Vacuum Breaker (PVB) may be used for service protection if the JCSA potable water service is the sole source of supply to the premises or property, if it is used strictly for irrigation, and there is no means or potential for backpressure (IE: PVB's protect against backsiphonage only). Any irrigation system that has a means to introduce chemicals into the JCSA potable water system shall always be protected against backflow by a RP backflow preventer.

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Approved backflow prevention devices and assemblies are those that meet AWWA standards, and are approved by ASSE and the USC-FCCC (University of Southern California Foundation for Cross Connection Control and Hydraulic Research).

*\*\*\* Please note that Double Check Valve Assemblies (DCVA) are not allowed in irrigation systems. Irrigation systems are considered as a “high hazard” and therefore are not allowed to use a DCVA.*

**10. How do I know if I have a backflow prevention assembly?** Generally, the backflow prevention assembly is normally located as close as possible to the water service connection, but must remain on private property. It is usually installed outdoors and in a “loop” of your irrigation system that extends above the ground. (See pictures below)



**RP Assembly**



**PVB Assemblies**



**11. Is there a minimum height that the backflow assembly must be installed?** Yes. Backflow prevention assemblies should be installed in accordance with the manufacturer’s installation instructions, the Uniform Statewide Building Code and any additional instructions offered by the JCSA. Regulations regarding flow orientation and proper access to the backflow preventer should also be followed (see the JCSA Backflow Prevention and Cross Connection Control Plan for further guidance).

At a minimum the following guidelines should be followed:

- PVB’s:
- Must be installed at least 12 inches above all downstream piping in the system. (The height of pop up sprinkler heads should be included in this requirement)
  - The height should not exceed 60 inches and the assembly should be accessible for testing and servicing.
  - The assembly should be properly supported.
  - No chemicals allowed.

- RP’s:
- Shall be installed a 12 to 36 inches above grade and not subject to flooding or submersion.
  - The assembly should be properly supported and accessible for testing and servicing.
  - Must be used if chemicals will be introduced in the irrigation system.

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*\*\*\*Note: Customers should take necessary actions to ensure that their backflow prevention assembly does not get damaged during freezing temperatures.*



**Properly installed RP Assembly**

**Properly installed PVB Assembly**

**RP installed too close to the ground**

**PVB installed too low**

- 12. How often do I have to have my backflow assembly tested?** They must be tested at least annually. Backflow assemblies are mechanical assemblies and as such they are subject to fail, which is why the VDH requires that they be tested at least once a year. In addition, newly installed backflow assemblies and backflow assemblies that are repaired or relocated must also be tested. This requirement is echoed by Virginia Maintenance Code, International Plumbing Code, and the Environmental Protection Agency's Cross Connection Control Manual.
- 13. How much will the inspections/maintenance cost?** Though the JCSA monitors the installation and maintenance of these assemblies as required by the Virginia Department of Health, we do not have any influence or control over the contractors pricing and it can vary from one testing contractor to another. Currently the prices we have been quoted are averaging from \$35 to \$100. We also understand that group pricing, whether through a neighborhood or homeowners association is an option that may lower your annual testing cost. Combining the test with other irrigation system maintenance may also net a savings for the homeowner. *The JCSA does not endorse, guarantee, or warrant any work performed by the testing contractors. All interactions between customers and contractors are private transactions between these two entities.*
- 14. Will there be a list of certified testers available to us? Where can we view this list?** Yes, a list of certified testers will be sent along with a letter reminding the homeowner to obtain the test. The list and the test form are also available [here](#). The list can also be found at the end of our Backflow Prevention and Cross Connection Program available for review on the JCSA website. The JCSA advises you should also check the website each year to ensure that your chosen tester is still a properly certified and approved tester as certifications are subject to expiration and revocation. *The JCSA does not endorse, guarantee, or warrant any work performed by the testing contractors. All interactions between customers and contractors are private transactions between these two entities.*

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- 15. Why is the testing contractor that I used before not on your list now?** Backflow Prevention Device Worker certifications are subject to expiration and revocation. You should inquire of your chosen tester's appropriate certification and also check the JCSA website each year to ensure that your chosen tester is still a properly certified and approved tester. If you desire, you may also check for your chosen contractor's certification at the Commonwealth of Virginia Department of Professional and Occupational Regulation website at [www.dpor.virginia.gov](http://www.dpor.virginia.gov).
- 16. Will I receive notification when to perform my test?** Yes. The JCSA tracks backflow assembly information in our database which generates a letter to our customers reminding them of the month that their annual test is due.
- 17. What if I don't receive a letter?** The absence of a reminder letter does not void the requirement of the annual inspection required by the JCSA Backflow Prevention and Cross Connection Program. Please note that the JCSA attempts to mail a letter to all irrigation system owners. We have also posted information on the County's website, submitted information in local newspapers, the County's fyi newsletters, and have included information with your water bill. Should you not receive a letter, please contact us at 757-259-4138 so that we can properly monitor and send you the annual testing notifications.
- 18. What do I do with my test report?** Your chosen tester should send a copy of the test report to the JCSA within 30 days of the test date and provide you a copy for your records. Please retain your copy in your records in case the contractor fails to send the test report to the JCSA or it is lost.
- 19. What happens if my backflow assembly fails the test?** If your assembly fails the test you should make arrangements to have the assembly repaired or replaced, as required, and retested within 15 days.
- 20. What if I do not get my backflow assembly tested or fail to have an improperly working backflow assembly repaired or replaced?** The JCSA hopes that you will share our desire to maintain a safe water distribution system. However, if you choose to not comply with this mandated program, you will risk a potential loss of water service and can be charged with a misdemeanor facing possible fines of up to \$2,500 per occurrence, per day.
- 21. Are any other backflow devices required for residential homes?** Yes. All outdoor faucets and hose bibs that have threaded connections where a garden hose can be attached are required to have backflow prevention protection. This may be in the form of a frost-proof automatic draining outdoor faucet with built in backflow preventer or by the use of a screw on hose connection vacuum breaker (HVB) that can be purchased at local hardware or home supply stores.



**Outdoor faucets with built in backflow protection**



**Screw on type Hose Bibb Vacuum Breakers**

*\*\*\*Note: Customers should take necessary actions to ensure that their backflow prevention device or plumbing does not get damaged during freezing temperatures.*

- 22. Why do we need hose connection vacuum breakers (HVBs) on faucets and hose bibbs?** Backflow can occur either by siphoning or back pressure from garden hoses. To prevent this, hose bibbs or faucets that are connected to a municipal water supply must be equipped with hose connection vacuum breakers (HVBs) to prevent water in the hose from moving back into the water supply. **The Virginia Plumbing Regulations specify that an atmospheric-type or pressure-type vacuum breaker or permanently attached HVB must be installed on all water outlets threaded for hose attachments except those for automatic clothes washers and water heater drain valves.**

Backflow can occur due to siphoning if the pressure in the water supply suddenly drops to a low level. This can happen if the municipal water pumping system fails, a municipal water line breaks or when fire trucks pump from fire hydrants. In each of these cases, the pressure in the water supply lines may drop below atmospheric pressure as the lines drain, creating a vacuum which can pull water (and any pollutants or contaminants) from a garden hose into the water supply lines.

Backflow can also occur due to back pressure if the pressure in a garden hose exceeds that in the supply pipeline. This can occur if pumps such as chemical injectors are connected to the garden hose. **Backflow due to back pressure can also occur even when pumps are not used.** For example, if a spray nozzle which can be shut off is used on the end of the garden hose and that spray nozzle is closed but the faucet is left open, the pressure in the

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hose will equilibrate with the water supply pressure and the hose will expand in response to the supply pressure. However, a sudden large water usage in the house or at another location can cause the supply pressure to drop. This will cause the hose to contract, forcing water from the hose back into the municipal supply. Pressure can also build up in a pressurized hose if air is trapped in the hose and then expands as it heats in the sun. This pressure buildup can force water from the hose backwards into the water supply pipelines. Hose connection vacuum breakers will prevent backflow from occurring from these sources by opening to relieve the pressure build-up as soon as the pressure in the hose becomes greater than the supply pressure.

A HVB is a small valve assembly that protects an individual water outlet (see pictures below). They are simple to install by threading the assembly onto the male hose threads of the faucet or hose bibb. HVBs are normally constructed of brass with hose threaded connectors. They are relatively inexpensive, costing approximately \$5 - \$10 and are available at most hardware home supply stores. They must be ASSE approved and customers should ensure that the ASSE letters are stamped on the backflow prevention device.

HVBs are easy to install and maintain. They work by venting water to the atmosphere when backflow conditions occur. Because they are simple, spring-operated devices, little maintenance should be required. HVBs should be inspected periodically to ensure that they are working properly. These simple checks for proper operation can readily be made each time the system is used: check for leaks while the system is operating and check for proper operation of the check valve and atmospheric vent whenever the system is shut off. With little maintenance, HVBs should provide several years of reliable service, preventing backflow of water and pollutants from garden hoses back to the water supply.



\*\*\*Note: An HBV is not a substitute for, nor should it be used for backflow prevention for in-ground irrigation systems.

\*\*\*Note: Customers should take necessary actions to ensure that their backflow prevention device or plumbing does not get damaged during freezing temperatures.

**23. Should a hose connection vacuum breaker (HVB) be used on frost-free hydrants? Yes,** but the device must be equipped with means to permit the line to drain after the hydrant is shut-off. Be sure it is equipped to drain the line to prevent freezing during our colder months of the year. Most manufacturers sell a frost-proof model which has a means to allow the homeowner to drain the line to prevent damage during freezing temperatures.

\*\*\*Note: Only sanitary yard hydrants are allowed to be connected to the public water supply. The homeowner may utilize a normal yard hydrant only if it is protected by an RPZ backflow prevention assembly, and it must also be labeled as “non-potable water”.

\*\*\*Note: Customers should take necessary actions to ensure that their backflow prevention device or plumbing does not get damaged during freezing temperatures.

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24. **Are there any special requirements for piers or docks?** Yes, as noted in Section 5 of our Virginia Department of Health's approved Backflow Prevention and Cross Connection Control Program, piers, docks, and other waterfront facilities (both commercial and residential) are required to have a backflow prevention assembly installed to protect the public water supply. There is potential for river water to be back-siphoned into the public water supply by a hose falling into the water during a water line break or other event causing reduced system pressure, i.e., a major fire, power outages, equipment failure, etc. Please contact the JCSA's Regulatory Compliance Office at 757-259-4138 if you have questions or concerns about this requirement.

\*\*\*Note: This requirement is also echoed in the Virginia Department of Health's Waterworks Regulations.