

GLOBAL WATER RESOURCES (GWR)**CODE OF PRACTICE****GWR-CP-EX-042****BACKFLOW PREVENTION AND CROSS-CONNECTION CONTROL****PURPOSE**

This code of practice defines guidelines and approved methods for the prevention of cross contamination by reducing the risks associated with potential backflow occurrences.

DEFINITIONS

1. Air gap separation - means a physical separation, between the discharge end of a supply pipe and the top rim of its receiving vessel, of at least one inch or twice the diameter of the supply pipe, whichever is greater.
2. Arizona Administrative Code R18-04-215 – provides guidelines and requirements for implementing a backflow prevention program in order to protect the potable water supply from cross contamination.
3. Arizona Administrative Code R14-2-405.B.6 - requires that any customer's lines be installed so as to prevent cross-connection or backflow.
4. Arizona Administrative Code R14-2-407 – requires that a customer is responsible for maintaining customer owned equipment.
5. Backflow – means a reverse flow condition that causes water or mixtures of water and other liquids, gases, or substances to flow back into the distribution system. Backflow can be created by a difference in water pressure (backpressure), a vacuum or partial vacuum (backsiphonage), or a combination of both
6. Back pressure - The difference between the pressure within any water service and a higher pressure within any vessel or pipework to which it is connected.
7. Backflow prevention – minimizing the risks of contaminating the potable water supply. Usually referred in context as a backflow prevention program.
8. Backflow prevention assembly - A device to prevent backflow. There are a number of different devices including a reduced pressure device, air gap and a double check valve.
9. Backsiphonage – condition that occurs when the water supply pressure falls below atmospheric pressure.
10. Contaminant - Any solid, liquid or gas with potential to enter or pollute the potable water supply.
11. Cross Connection - a physical connection between the public water system and any other source of water or other substance that may lead to contamination of the drinking water supply through backflow.
12. Distribution system – all physical components of the water supply system, including water pipes, reservoirs, booster pumps, hydrants and other means used to deliver drinking water to the customers
13. Double check valve assembly - a backflow-prevention assembly that contains two independently acting check valves with tightly closing, resilient-seated shut-off valves on each end of the assembly and properly located, resilient-seated test cocks.
14. Potable system – all components of the water system from the source of the potable water through the distribution system
15. Pressure vacuum breaker assembly - backsiphonage prevention assembly that contains an independently operated, internally loaded check valve; an internally operated air-inlet valve located on the discharge side of the check valve; tightly closing resilient seated shut-off valves on each end of the check valve assembly; and properly located resilient seated test cocks.
16. Reduced pressure principle assembly - a backflow-prevention assembly that contains two independently acting check valves; a hydraulically operating, mechanically independent pressure differential relief valve located between the two check valves; tightly closing, resilient seated shut-off valves on each end of the check valve assembly; and properly located resilient seated test cocks.

17. Water hammer – A pressure surge caused by a rapid change in pressure or flow. The noise (bang) is the collapse of vapor bubbles in areas of low pressure. The resultant pressure surges can damage plumbing systems.

RATIONALE

In accordance with Arizona Administrative Code (AAC) R18-04-215, a public water system shall protect its system from contamination caused by backflow through unprotected cross-connections by requiring the installation and periodic testing of backflow prevention assemblies. AAC R14-2-405.B.6 requires that any customer's lines be installed so as to prevent cross-connection or backflow.

Global Water requires the installation of backflow prevention assemblies at the service connection of those establishments where there exists a possibility of contamination caused by backflow through unprotected cross-connections which are not specifically exempted by the subject rule.

In all cases, the need for and the type of backflow prevention assembly will be specified by Global Water, and will be located on the customer's side of the service connection. The approved backflow prevention device will be installed, owned, tested and maintained by the customer. In accordance with the Arizona Administrative Code R14-2-407, the customer is responsible for maintaining customer owned equipment.

Global Water is committed to providing a continuing program of cross connection control through the standards of a backflow prevention program.

HAZARD POTENTIAL

The degrees of hazard potential shall be identified in order of degree from highest to lowest. High being the greatest threat potential for public health and safety.

Hazard Ratings

High – any condition, device or practice which has the potential to cause death when connected to the potable water supply system.

Medium – any condition, device or practice which could endanger health when connected to the potable water supply system.

Low – any condition, device or practice which would be a nuisance but does not endanger health when connected to the potable water system.

APPROVED BACKFLOW PREVENTION METHODS

A backflow prevention method shall be any assembly or other means designed to prevent backflow. The following are the recognized backflow prevention methods which the Company may require.

1. Air gap: The unobstructed vertical distance through the free atmosphere between the opening of any pipe or faucet supplying potable water to a tank, plumbing fixture or other device and the flood level rim of said tank, plumbing fixture or other device. An approved air gap shall be at least double the diameter of the supply pipe or faucet and in no case less than one (1) inch.
2. Reduced pressure principle assembly ("RP"): An assembly containing two (2) independently acting approved check valves together with a hydraulically operating, mechanically independent pressure differential relief valve located between the check valves, and at the same time below the first check valve.

The assembly shall include properly located test cocks and tightly closing shut-off valves at each end of the assembly.

3. Double check valve assembly ("DC"): An assembly composed of two (2) independently acting, approved check valves, including tightly closing shut-off valves located at each end of the assembly and fitted with properly located test cocks.
4. Pressure vacuum breaker assembly ("PVB"): An assembly containing an independently operating check valve and an independently operating, loaded air inlet valve located on the discharge side of the check valve. The assembly shall be equipped with properly located test cocks and tightly closing shut-off valves located at each end of the assembly.

BACKFLOW PREVENTION METHOD REQUIREMENTS

The type of backflow prevention assembly installed will be determined by the relative hazards posed by each customer as determined in the following four categories.

- Category 1 – Non-residential, Commercial and Industrial property service lines
- Category 2 – Non-exempt single-family and Multi-family residences with common or dual plumbing
- Category 3 – Dedicated Irrigation service lines
- Category 4 – Fire Lines

There are certain activities which may pose a hazard to the potable water system that may be conducted on the premises of any of the customer categories listed above; therefore, a potential hazard to the potable water supply shall be presumed and a backflow prevention method must be utilized or installed at the service connection for those customers.

Non-exempt Single Family Residences

Backflow Prevention Protection is required in single family residences if any of the following conditions exist and subjected to be determined by Global Water:

1. Customer owns a private well and is served additionally by the utility
2. Zoned horse and/or animal acreage properties
3. Operating a home business whose business is subjected to receipt, generation or storage of hazardous materials
4. Residential properties where the potential for cross connections exists (eg. landscape irrigation with recycled water, dual water main installations with potable and non-potable water)

When two (2) or more hazardous activities are conducted on the same premises and served by the same service connection, the most restrictive backflow prevention method required for any of the hazardous activities conducted on the premises shall be required to be utilized or installed at the service connection. The order of most restrictive to least restrictive backflow prevention methods shall be as follows:

1. Air gap
2. Reduced pressure principal assembly
3. Pressure vacuum breaker assembly
4. Double check valve assembly

BACKFLOW ASSEMBLY INSTALLATION REQUIREMENTS

****For all new services that require a backflow assembly installation, the backflow assembly must be installed within 24 hours of meter installation and the test report must be submitted to Global Water Resources within 24 hours of completing the testing. The test report(s) shall be submitted electronically through the Global Water Resources website at www.gwresources.com.****

Backflow prevention assemblies shall be installed by the customer, at the customer's expense and in compliance with the standards and specifications adopted by Global Water, at the service connection. The assembly shall have a diameter at least equal to the diameter of the service connection.

The assembly shall be in an accessible location approved by Global Water. A reduced pressure principle assembly and pressure vacuum breaker assembly shall be installed no less than 12 inches above ground. A double check valve assembly may be installed, at the customer's option, below ground in a vault which meets standard specifications established by Global Water.

When a customer desires a continuous water supply, two (2) or more backflow prevention assemblies shall be installed parallel to one another at the service connection to allow a continuous water supply during testing of the backflow prevention assemblies. When backflow prevention assemblies are installed parallel to one another, the sum of the areas of the diameters of the assemblies shall be at least equal to the area of the diameter of the service connection.

It shall be unlawful, and punishable as a misdemeanor, for any person to bypass or remove a backflow prevention method without the approval of Global Water.

INSTALLATION OF BACKFLOW PREVENTION ASSEMBLIES FOR FIRE SPRINKLER SYSTEM

When a backflow prevention assembly is required for a water service connection supplying water only to a fire sprinkler system, the assembly shall be installed at the service connection in compliance with the standard specification adopted by Global Water.

If the chief inspector, or his designee, determines that a fire sprinkler system shall have a continuous water supply which may not be interrupted during testing of the backflow prevention assembly, the customer shall install, at his expense, two (2) backflow prevention assemblies parallel to one another at the service connection. The diameter of each assembly shall be at least equal to the diameter of the service connection.

Modifications of an existing service connection supplying water solely to a fire sprinkler system shall require the entire system to comply with the requirements.

CONSTRUCTION/HYDRANT METER BACKFLOW PREVENTION REQUIREMENTS

Backflow protection prevention shall be required on all hydrant meters and construction water meters. The backflow prevention assemblies are owned by Global Water and are attached to the meters upon deployment for temporary water service.

The customer will be responsible for any damage and/or theft of the backflow assembly. If it is determined a backflow prevention assembly has been damaged or compromised, water service to the meter shall immediately be discontinued and will not be restored until compliance with the backflow prevention has been restored.

Please refer to the Global Water Resources Code of Practice GWR-CP-EX-009, WATER FROM HYDRANTS/CONSTRUCTION WATER for more detailed information.

INSPECTIONS

A customer's water system shall be subject to inspection by authorized personnel of Global Water. The inspection shall be conducted during normal business hours on the premises to determine whether any cross-connections or other hazard potentials exist and to determine compliance.

CUSTOMER NOTIFICATION OF ANNUAL TESTING

It is the responsibility of the customer to ensure the inspection and testing of backflow prevention assemblies is conducted by a certified backflow tester. The certified backflow tester shall submit the test report directly to Global Water at www.gwresources.com. All installed backflow prevention assemblies will be subjected to annual testing to be performed by a certified backflow tester.

Global Water will notify each affected customer when it is time for their backflow prevention assembly to be tested. First notices for assembly testing will be mailed during the last week of the previous month in which the testing is due. This written notice shall give the customer 30 days to have the assembly tested and in proper working order.

A second notice will be sent to each customer that does not complete the required backflow assembly test, as prescribed in the first notice, within the 30 days allowed. Second notices shall be mailed by the 15th day of the following month in which the testing was due. The second notice will give the customer an additional 14 days to complete the backflow assembly test.

If no action is taken within the 14 day period, a Final notice will be sent notifying the customer that water service will be disconnected if they do not comply with the backflow prevention program. If the non-compliance condition is not remedied within 7 days of the Final notice, Global Water will send a disconnect notice indicating a disconnect date of their water service. **Immediate disconnection of water service will result on any service connection when Global Water discovers that the customer's water system is contaminating the potable water supply.** All fees incurred for non-compliance of the backflow prevention program will be the customer's responsibility.

It is important to note, all backflow prevention assemblies must be marked as "Passed" on the test report. "Failed" tests must be reported verbally to the Global Water Compliance Department at 623-580-9600 within 24 hours. Failed assemblies must be repaired or replaced and retested in order to meet compliance with the program. Depending on the relative hazards posed, Global Water may require repairs or replacement be completed immediately in order maintain protection of the system.

TEST AND MAINTENANCE RECORDS

The customer shall test and service backflow prevention assemblies once a year. If the testing reveals the assembly to be defective or in unsatisfactory operating condition, the customer shall perform any necessary repairs, including replacement or overhaul of the assembly, if necessary, which will return the assembly to compliant operating condition.

If Global Water or the customer learns or discovers, during the interim period between tests, that an assembly is defective or in unsatisfactory operating condition, the customer shall perform any necessary repairs, including replacement or overhaul of the assembly, if necessary, which will return the assembly to compliant operating condition.

The annual testing shall be performed by an individual certified backflow tester. A list of certified backflow testers can be found at the American Backflow Prevention Association website as well as in the yellow pages. Global Water makes no representation on abilities, performance or quality of service for any certified backflow tester and highly recommends the customer confirms the qualifications of the certified tester.

The customer shall maintain records, on forms approved by Global Water, of the results of all tests and all servicing, repairs, overhauls or replacements of the backflow prevention assembly. A copy of the test records shall be promptly submitted to Global Water. Test reports shall be submitted electronically through the Backflow Prevention section of the Global Water website. The test reports shall be retained for a period of three (3) years.

MODIFICATION OF BACKFLOW PREVENTION REQUIREMENTS

If Global Water determines, after inspection of the customer's system, that a backflow prevention method less restrictive than that required will provide adequate protection of the potable water supply from the degree of hazard potential by the customer's water system, Global Water may, in its sole discretion, modify the requirements.

DISCONTINUANCE OF WATER SERVICE

If Global Water discovers that a customer has not installed a required backflow prevention method or that a backflow prevention method has been improperly tested or maintained, bypassed or removed, or that an unprotected cross-connection exists in the customer's water system, the water to that service connection shall be disconnected if the situation is not remedied within the time specified in the notice sent to the customer as required by this section. The service shall not be restored until the condition is remedied.

Water service to a fire sprinkler system shall not be subject to disconnection under this section. If a situation, which would otherwise result in discontinuance of water service in subsection above, is not remedied within the time provided in the notice sent to the customer, the customer may be issued a notice for non-compliance of the backflow prevention program. This notice may include fees for remedial actions completed by the utility to protect the potable water system. Each day the situation is allowed to continue thereafter shall constitute as a separate violation of this section and may be subject to additional fees.

Prior to disconnecting any water service due to non-compliance of the backflow prevention program Global Water shall send a notice to the customer describing the condition and notifying the customer the condition must be remedied within a certain time period. If such condition is not remedied within the date noted in the violation notice, no further notices will be sent to the customer and water service will be disconnected. **Immediate disconnection of water service will result on any service connection when Global Water discovers that the customer's water system is contaminating the potable water supply.**

RETROACTIVE APPLICATION

The provisions of this Code of Practice shall apply to all new and existing water customers, as applicable.

Backflow prevention assemblies installed prior to enactment of this Code of Practice, and which do not comply with the requirements set forth in this Code of Practice, shall be replaced with assemblies which comply with the standards set forth herein.

PLAN REVIEW

All backflow prevention assemblies which will be installed shall be shown and specified on all required building and engineering plans. Global Water approval of the intended assembly installation is required prior to issuance of water service.

