

PART 1 - PURPOSE

The purpose of the SCPW backflow and cross connection control program is to protect and maintain the public water system such that it is free from potential hazards to the health of its customers, and such that safe and potable water in sufficient quantity and pressure is delivered.

The program has been implemented to eliminate and/or control any existing and potential unprotected cross connections between the water supply system and any other water systems, sewers, drain lines, piping systems or containers containing possible contaminants.

PART 2 - DEFINITIONS

2.1 "Air Gap" means a physical separation sufficient to prevent backflows and back siphons between the free flowing discharge end of the potable water system and any other system, vessel, vat, tank, etc. This physical separation must be a minimum of twice the diameter of the supply side pipe, but never less than one inch. This method or device is approved for use on High Priority category cross connections.

2.2 "Approved" means accepted by SCPW and SCDHEC as meeting the required standards and specifications, and is suitable for the proposed use.

2.3 "Atmospheric Vacuum Breaker" means a device which prevents a back siphon by creating an atmospheric vent in the line. It is important to note that no shut-off devices (i.e. valves) shall be installed on the downstream side of this device because it is not designed to function under continuous pressure on fro the discharge side. This device is approved for use on Low Priority situations where only back siphons are being addressed.

2.4 "Backflow" means the undesirable reversal of the flow of water or other liquids, mixtures, gases or other substances into or towards the public water system from any source.

2.5 "Backflow Assembly/Device/Preventer" means any device or means approved by SCPW and SCDHEC for use in preventing backflows and back siphons under its prescribed limited conditions and designed use. These devices consist of, but are not limited to: Air Gap, Reduced Pressure Backflow Preventer, Double Check Valve Assembly, Pressure Vacuum Breaker, Atmospheric Vacuum Breaker, Hose Bibb Vacuum Breaker,

Residential Dual Check, and Double (or Dual) Check with Intermediate Atmospheric Vent.

2.6 "Back Siphon" means a situation when the supply line pressure falls to atmospheric pressure or below, thereby creating a vacuum or negative pressure.

2.7 "Certified Tester" means any person approved by SCPW and SCDHEC that has successfully passed the SCDHEC backflow testing examination. A list of Certified Testers is available at the SCPW Cross Connection Department.

2.8 "Commercial Irrigation System" means an irrigation system that is not used for residential service and included, but is not limited to, irrigation services for commercial facilities and subdivision entrance landscaping.

2.9 "Containment" means a method of backflow prevention which requires a backflow device immediately downstream of the water meter on a service connection. This method is utilized to protect the public water system, however the Owner must provide other means of protecting the private service lines from contamination. The type of device installed shall be commensurate with the degree of hazard identified.

2.10 "Contaminant" means any physical, chemical, biological or radiological substance or matter in water, impairing the safety and quality of the water.

2.11 "Cross Connection" means any actual or potential connection or structural arrangement between a public water system and any other source or system through which it is possible to introduce into reuse water, industrial fluid, gas or other substances that may contaminate the potable water system.

2.12 "Customer" means any person who operates or resides in a property upon which a cross connection inspection is to be made or upon which a cross connection is present or suspected of being present.

2.13 "Double Check Valve Assembly" means an assembly of two independently operating spring or weight loaded check valves with tightly closing (resilient seat or ball) valves on each end of the check valves, plus properly located test cocks for the testing of each valve. This device is approved for use on "Low Priority" category cross connections.

2.14 "Double (or Dual) Check Valve with Intermediate Atmospheric Vent" means a device having two spring loaded check valves which are separated by an atmospheric vent. This device is only available in small sizes (1 inch in diameter or smaller). It has no test cocks or ball valves, and is usually used for internal protection. This device is approved for use on "Low Priority" category cross connections. These devices are an acceptable mean of backflow prevention, but their average working life span without necessary repairs and maintenance is less than five years.

2.15 "High Priority" means situations where an actual or potential threat to the public water supply of a physical or toxic nature that would be a danger to public health.

2.16 "High Priority Residential Irrigation System" means a residential irrigation system that is connected to a chemical feed system or to a water source other than SCPW.

2.17 "Hose Bibb Vacuum Breaker" means a device permanently attached to a hose bibb which acts as an "Atmospheric Vacuum Breaker". It is normally approved for "Low Priority" category cross connections to prevent back siphons.

2.18 "Low Priority" means situations where the potential of a hazard exists, but would not constitute a threat to public health, however, it may cause an actual or potential threat to the physical properties of the water sufficient to cause a nuisance or be aesthetically objectionable.

2.19 "Low Priority Residential Irrigation System" means a residential irrigation system that is not connected to a chemical feed system or to a water source other than SCPW.

2.20 "Manager" means the Manager of the SCPW water distribution system, including personnel authorized to act on behalf of the Manager and personnel authorized to initiate and implement the backflow prevention and cross connection program.

2.21 "Owner" means any person who has legal title, or license, to operate or reside on a property upon which a cross connection inspection is to be made or upon which a cross connection is present or suspected to be present.

2.22 "Person" means an individual, partnership, co-partnership,

cooperative, firm, company, public or private corporation, political subdivision, agency of the State, trust, estate, joint structure, company or other legal entity of their legal representative or agent.

2.23 "Pressure Vacuum Breaker" means a device identical to the "Atmospheric Vacuum Breaker" except that it is equipped with two tightly closing shut-off valves and an internal spring which allows it to be installed under continuous pressure. This device is only approved for use in "Low Priority" situations to prevent back siphonage.

2.24 "Reduced Pressure Backflow Assembly/Device/Preventer" means an assembly consisting of two independently operating check valves with an automatic operating differential relief valve located between the two check valves. Tightly closing shut-off (resilient seat or ball) valves shall be located at each end of the check valves, and properly located test cocks are to be positioned for the testing of the check and relief valves. This device is approved for "High Priority" category cross connections, and may never be installed below ground or in a location or manner which will subject the device to possible flooding or allow the relief valve to become submerged under water.

2.25 "Residential Dual Check" means a device with two independently operating check valves. This device is not equipped with shut-off valves or test cocks, and is approved for "Low Priority" category cross connections. Residential Dual Checks are normally employed as contaminant devices and are installed at or in the service connection meter box.

2.26 "SCDHEC" means the South Carolina Department of Health and Environmental Control, including persons authorized to act on behalf of the Department.

2.27 "SCPW" means the Commissioners of Public Works of the Town of Summerville, its Cross Connection Department, and authorized personnel.

PART 3 - GENERAL CONSIDERATIONS

SCPW's requirements for backflow prevention and cross connection control are subject to change as the result of USEPA and SCDHEC revisions to the "State Primary Drinking Water Regulations", whenever and wherever new potential hazards arise and in order to continue to provide the safest drinking water practical. It

is the consumers' responsibility to possess and be familiar with the most current SCPW revision to these requirements. All questions and/or requests should be addressed to the SCPW Cross Connection Department.

3.1 When a backflow prevention assembly has been required by SCPW in a proposed water service, it must be installed and tested prior to the water service being activated. Backflow prevention assemblies required by SCPW in existing water services shall be installed within ninety days from the date of written notification from the SCPW Cross Connection Department. Failure to comply may result in service activation being delayed or the water service being disconnected.

All backflow devices shall be tested immediately after installation, and at least one time each year. All tests shall be performed by a SCDHEC certified tester. SCPW reserves the right to accept or refuse testers on SCDHEC's approved test list. A copy of the test results shall be immediately forwarded to SCPW on the test forms supplied by the SCPW Cross Connection Department.

It is the intention of the SCPW Cross Connection Department to notify the customer that the assembly is due for its annual inspection thirty days prior to the anniversary date of the initial installation.

3.2 All applicable plumbing codes and regulations, in conjunction with these specifications shall be met when installing and testing a backflow assembly. Also refer to following publications: "Cross Connections and Backflow Prevention" by Gustave J. Angele, Sr., the "Manual of Cross-Connection Control, Ninth Edition" by the Foundation for Cross-Connection Control and Hydraulic Research at the University of Southern California, the Southern Building Code Congress International's "Standard Plumbing Code", and the AWWA Manual M14 "Recommended Practices for Backflow Prevention".

3.3 All backflow assemblies must be installed horizontally, and on the customer's side of the meter prior to the first connection (preferably adjacent to the meter). Assemblies shall be insulated to prevent freezing, protected from traffic and other potential hazards, and readily accessible to SCPW personnel. Installations within structures may be permitted, if

prior approval is obtained from SCPW. Bypass piping is not permitted unless it is equipped with an approved assembly similar to the main line device. In some instances it may be desirable or necessary to install two approved backflow prevention assemblies in parallel in order not to interrupt water service during testing. Reduced pressure type assemblies shall be installed such that the port will never become submerged. This prohibits the installation of reduced pressure assemblies under ground, or in a pit that cannot be drained by gravity to the ground surface.

3.4 SCDHEC provides a list of approved assemblies. Contact the SCPW Cross Connection Department for assistance in selecting a device. SCPW reserves the right to accept or refuse devices from SCDHEC's approved list.

3.5 To insure proper operations of assemblies, SCPW reserves the right to conduct random testing of assemblies on a periodic basis. The Owner will be given adequate notification prior to the test.

3.6 High temperature assemblies, which are non-standard equipment, shall include documentation certifying their ability to withstand high temperatures.

3.7 All reduced pressure and double check valve devices on the list of approved assemblies shall be equipped with resilient seat gate valves or ball valves.

PART 4 - GENERAL REQUIREMENTS

4.1 New Construction

The Manager and SCPW shall conduct on-site evaluations, inspections and interviews, and review proposed construction plans in order to determine the degree of hazard in question. They shall then prescribe backflow prevention measures (devices) which are commensurate with the degree of hazard in question. A minimum of a residential dual check valve assembly will be required on all services.

Any newly installed double check valve or reduced pressure backflow assembly shall be tested immediately by a certified tester prior to any final approval of service being issued by

the Manager. The appropriate test result forms shall be submitted to the SCPW Cross Connection Department.

The Manager has the authority to decide whether the device must be installed at the service connection meter (containment approach), or whether the cross connection in question may be adequately eliminated or protected within the facility at or near its point of origin (internal protection approach).

4.2 Existing Premises

Utilizing water customer billing records, telephone calls, personal interviews and inspections, the Manager and SCPW shall evaluate all existing customers' premises in order to determine which facilities will be required to install protective devices. The type of device to be required and the length of time allowed for the installation of the device will also be determined.

Any newly installed double check valve or reduced pressure backflow assembly shall be tested immediately by a certified tester prior to any final approval of service being issued by the Manager. The appropriate test result forms shall be submitted to the SCPW Cross Connection Department.

The Manager and SCPW shall not allow any existing cross connection to remain unless it is protected by an approved backflow or back siphon preventer, which is commensurate with the degree of hazard in question. The Manager has the authority to decide whether the device must be installed at the service connection meter (containment approach), or whether the cross connection in question may be adequately eliminated or protected within the facility at or near its point of origin (internal protection approach).

The Manager shall implement reasonable, but firm, time schedules for compliance with testing and installation requirements.

The Owner/Customer shall be responsible for meeting all compliance schedules, as well as for installation and connection fees and required testing.

PART 5 - PRIORITY FOR INSTALLATION OF BACKFLOW DEVICES

SCPW recognizes the threat to the public water system arising from cross connections. All hazard and potential hazards shall

be classified as High or Low Priority, and shall require the installation of an appropriate, approved backflow prevention device. All categories of business and residential customers classified as High Priority will be required to install a minimum of a testable double check valve assembly. This requirement is in addition to the requirements of any on-site backflow devices required separately by SCDHEC regulations.

To determine the nature of the existing or potential hazards, SCPW shall initially focus on the High Priority facilities. This includes facilities which offer the potential threat of contamination of a toxic nature (ie. chemical, bacteriological, or industrial).

The Owner shall be responsible for notifying the SCPW of any existing, proposed or modified cross connections of which the Owner has knowledge, but which has not been identified by SCPW.

If the Manager determines at any time that a serious threat to the public health exists from an actual or potential cross connection, the water service may be terminated immediately and remain terminated until the Manager determines that a serious threat to the public health no longer exists.

All Low Priority Residential Irrigation Systems shall have a residential dual check assembly to protect SCPW's water system from possible water contamination. SCPW will be responsible for testing a sample population of residential dual check assemblies on an annual basis throughout the SCPW service area. Any defective residential dual check assemblies will be immediately replaced. If more than 15% of the residential dual check assemblies from the sample population are defective, immediate investigation will be initiated to broaden the test area and determine if a more aggressive replacement schedule is required. Otherwise, the devices will be replaced along with the meter (approximately every 15-20 years).

PART 6 - RESPONSIBILITIES, OBJECTIVE AND BASIS

The objective of the SCPW Cross Connection Department is to insure that the water distribution system is protected from possible sources of contaminants. The basis on which the Department functions is the "State Drinking water Regulations [R61-58.4 paragraphs D(14), E(1-4) and F(1-6)]" and the "State Drinking Water Act [SC Code Sections 44-55-10 et seq. and 5-31-250]".

In order to keep the water distribution system safe, the

consumer, SCPW, SCDHEC, plumbing inspectors, and plumbers all have important responsibilities to fulfill. Unless each person in the process does his/her part, the system may not remain protected. Anytime any of the above named persons learns of an existing or potential problem or hazard they shall notify the SCPW Cross Connection Department immediately so remedial action can be taken.

6.1 Property Owner and Customer's Responsibilities

The Property Owner and Consumer have the responsibility to keep contaminants out of the distribution system. This responsibility begins at the user's connection, and includes any and all water service piping and appurtenances on the premises. The Property Owner and/or Customer, at their own expense, shall install, have tested and maintain approved backflow prevention assemblies as required by SCPW. The consumer has the ultimate responsibilities for preventing possible cross connections and maintaining cross connection prevention assemblies.

6.2 SCPW'S Responsibilities

SCPW has the responsibility to protect the distribution system and the public from contaminants that may result from backflows and back siphons. This responsibility begins at the water source, includes the entire water distribution system and ends at the user's connection. SCPW shall not provide or continue water service to premises where an unprotected cross connection exists or has the potential to exist. SCPW and SCDHEC have rules promulgating and enforcing laws, rules, regulations and policies necessary to carry out the designated responsibilities of the parties involved. SCPW has the ultimate authority to prohibit the possibility of cross connection hazards in its water service area.

6.3 SCDHEC'S Responsibilities

As stated above, SCDHEC has the overall responsibility for promulgating and enforcing laws, rules, regulations and policies pertaining to cross connection prevention. They also have the responsibility to oversee that SCPW and all public water systems implement and follow guidelines meeting or exceeding the ones they set forth.

6.4 Plumbing Inspector's Responsibility

The local municipal or county plumbing inspector has the

responsibility for enforcing the plumbing codes and regulations established to prevent cross connections.

6.5 Plumber's Responsibilities

Plumbers shall be responsible for ascertaining the degree of hazard involved, consulting with SCPW and the plumbing inspector regarding the appropriate assembly required to prevent possible cross connections, and installing the device per the manufacturer's, SCPW's and the plumbing code requirements. It is also the responsibility of the Plumber to have an approved, certified tester inspect the device to assure that it is functioning properly at the time of installation.

PART 7 - ADMINISTRATIVE RESPONSIBILITY

The SCPW owns and operates the potable water distribution system within its specified water service area, and is authorized by SCDHEC to operate a cross connection control program pursuant to applicable laws, regulations and codes. The SCPW Cross Connection Department oversees and enforces a cross connection program to protect the water system from contaminants. The program consists of inspections, annual testing of assemblies, record keeping and enforcement. The inspection and testing program is constantly ongoing because the users most likely to endanger the public system are continually making piping changes, exchanging or adding equipment, and/or changing the way they operate. All of these activities carry the possibility of creating an inadvertent cross connection. SCPW therefore, since it has the primary responsibility for protection of the water system, monitors the Consumers internal systems to insure such protection. Any hazard identified is required to be addressed immediately by the Customer, and at the Customer's sole expense.

The SCPW Manager has the primary organizational responsibility of enforcing the cross connection program and maintaining all records pertaining thereto. If the Manager requires the water supply system to be protected by the "Containment Approach" then the customer shall be responsible for the water quality and protection of the employees/residents beyond the containment device.

The customer shall allow his/her property to be inspected for possible cross connections and shall follow the provisions of

the SCPW and SCDHEC regulations. The customer is also responsible for addressing deficiencies and/or possible hazards immediately after they are identified.

PART 8 - TESTING REQUIREMENTS

As part of the cross connection control program, the Manager requires each device to be tested by a certified tester on the anniversary of the installation date at a minimum. The Manager may require more frequent testing as deemed necessary based upon the age and condition of the device, where there is a history of test failures, and/or due to the degree of hazard involved. All testing shall be performed at the Owner's expense.

The certified tester performing the test shall furnish the Owner with a written report of the inspection and testing results on a SCPW approved form. The certified tester shall submit a copy of the test report to the SCPW Cross Connection Department. The results will be maintained by SCPW for a period of five years.

Newly installed devices shall be tested by a certified tester after installation and before use by the Owner. Any backflow prevention device, which fails during a test, shall be repaired or replaced at the Owner's expense. High Priority cross connections shall not be allowed to remain unprotected due to a malfunctioning backflow prevention device. A compliance date of not more than thirty days after the test date shall be established for successful repair, replacement and testing of the device in question.

SCPW reserves the right to conduct random "follow-up" testing of backflow prevention assemblies to insure proper operation of the device.

When testing a Reduced pressure or Pressure Vacuum Breaker assembly, a Differential Gauge test kit shall be used. When testing a Double Check Valve assembly, the Vertical Tube Test is the preferred method, however the Differential Gauge test kit can be utilized with a single hose.

PART 9 - RECORD KEEPING

The Manager shall initiate and maintain the following records for a minimum of five years:

- Master files on cross connection surveys and inspections including the Owner's name, address, phone number and device location, if present.

- Copies of cross connection device test results furnished by the certified tester and/or SCPW personnel.
- The most current lists of SCDHEC and SCPW approved devices and certified testers.

All records shall be open for inspection by the public during normal business hours, an appointment shall be made in advance with the SCPW Cross Connection Department.

PART 10 - ENFORCEMENT

Failure by an Owner/Customer to comply with these regulations may result in full legal enforcement under the SCDHEC "State Primary Drinking Water Regulations, Section 61-58.7(F)" and state and local codes. The water service may be terminated following failure to install, test or repair backflow prevention devices within the time allowed.

PART 11 - LIST OF HIGH PRIORITY FACILITIES

The following is a list of facilities, which are deemed to be high priority under the backflow prevention and cross connection program. This designation includes, but is not limited to the following:

- Apartments with pools and/or laundry rooms and water services one inch in diameter or larger
- Auto service, cleaning and repairs
- Boat service, cleaning and repairs
- Car washes (some may require reduced pressure backflow assemblies)
- Chemical plants (only reduced pressure backflow assemblies)
- Churches with baptismal fountains and/or daycare facilities
- Commercial irrigation system (only reduced pressure backflow assemblies)
- Connections between public water systems
- Dry Cleaners
- Fire and police departments
- Fire protection and sprinkler systems
- Funeral homes (only reduced pressure backflow assemblies)
- Garbage and sanitation facilities
- Gas and service stations
- Grocery stores

- Hair stylists, beauty shops and barber shops
- Hardware and/or paint stores
- High priority residential irrigation system (only reduced pressure backflow assemblies)
- Highway maintenance sheds
- Hospitals and medical facilities
- Hotels and motels
- Industrial and manufacturing facilities
- Laundromats
- Pest control businesses
- Pet grooming and boarding facilities
- Post office
- Public and private swimming pools
- Restaurants
- Schools and day care centers
- Sewer cleaning equipment
- Veterinary clinics
- Wastewater pump stations and treatment facilities (only reduced pressure backflow assemblies)

Any of these facilities may be required, at the sole discretion of the Manager, to install a reduced pressure backflow preventer at a minimum. Existing facilities using 3/4 inch diameter service connections may be required, at the sole discretion of the Manager, to install only a residential dual check valve.