

**TAPPAHANNOCK MODEL
CROSS CONNECTION CONTROL
AND
BACKFLOW PREVENTION
PROGRAM**

I. Purpose of the Program

Purpose of this Program is to abate or control actual or potential cross connections and protect the public health. This Program provides for establishment and enforcement of a program of cross connection control and backflow prevention in accordance with the Commonwealth of Virginia, State Board of Health, Waterworks Regulations 2003, or as amended. This program is directed at:

A. Service Line Containment:

Abate or control actual or potential cross connections and protect the public health by installation of an appropriate backflow prevention assembly or by installation of a backflow elimination method, at the service connection.

B. Voluntary isolation in lieu of containment:

Evaluate the alternative of point-of-use isolation protection in lieu of service line containment at each premise where containment is required.

C. Public Education and Assistance:

Provide a cross connection awareness public education program and provide public assistance where requested.

D. Premise Owner/Occupant Awareness:

Advise those affected that service line containment does not provide protection from cross connections in the internal service plumbing of a building.

II. Authority of Program

Commonwealth of Virginia, Department of Health, Waterworks Regulations, Part II, Article 3: Cross Connection Control and Backflow Prevention in Waterworks. This article requires as a condition for the issuance and continued use of the operation permit for the Town of Tappahannock that the owner of the waterworks establish and enforce a program of cross connection control and backflow prevention.

This cross connection control and backflow prevention program is approved by the State Health Commissioner as noted by the affixed approval stamp.

III. Enforcement of the Program

A. Request for Information

Upon request, the owner or occupants of property served shall furnish to the Town of Tappahannock pertinent information regarding the consumer's water supply system or systems on such property for the purpose of assessing the consumer's water supply system for cross connection hazards and determining the degree of hazard, if any. The refusal of such information, when requested, shall be deemed evidence of the presence of a high degree of hazard cross connection.

B. Notice of Corrective Action:

Any consumer's water supply system owner who may be in violation of any provision of this Program shall be served a written notice sent certified mail to the consumer's water supply system owner's last known address, stating the nature of the apparent violation, correction action required, and providing a

reasonable time limit, not to exceed thirty (30) days, from the date of the receipt of the notice, to bring the consumer's water supply system into compliance with this program.

C. Enforcement

Town of Tappahannock shall take positive action to ensure that the waterworks in adequately protected from cross connections and backflow at all times. Appropriate preventive and control measures shall be required and installed. If a required backflow prevention assembly is not installed, tested, and maintained in accordance with the applicable sections of this program; or if a required backflow prevention assembly has been removed or bypassed; or if unprotected cross connections exist on the premises and the Town of Tappahannock has determined that there is inadequate backflow prevention at the service connection, the Town of Tappahannock shall discontinue or refuse the water service to the consumer and water service shall not be restored until the deficiencies have been corrected or eliminated to the satisfaction of the Town of Tappahannock.

IV. General Responsibilities of the Town of Tappahannock

Effective cross connection control and backflow prevention requires the cooperation of the Town of Tappahannock, the owner(s) of the property served the Local Building Official, and the certified Backflow Prevention Device Worker.

A. The program shall be carried out in accordance with the Commonwealth of Virginia, State Board of Health, Waterworks Regulations and shall as a minimum provide containment of potential contaminants at the consumer's service connection.

B. The Town of Tappahannock has full responsibility for maintaining water quality in the distribution system and for the construction, maintenance and operation of the waterworks beginning at the water source and ending at the service connection.

C. The owner of the property served and the Town of Tappahannock have shared responsibility for water quality and for the construction, maintenance and operation of the consumer's water supply system from the service connection to the free flowing outlet.

D. The Town of Tappahannock shall, to the extent of their jurisdiction, provide continuing identification and evaluation of all cross connection hazards having potential for impairing the quality of the water as delivered. Continuous identification and evaluation shall include: assessment of each residential and non-residential consumer's water supply system including any existing backflow prevention assemblies or devices or backflow elimination methods; a determination of the degree of hazard, if any, to the waterworks (See Table 1, Determination of Degree of Hazard) and a determination of the appropriateness of existing preventative and control measures. Assessments shall as a minimum be conducted at annual intervals.

E. To facilitate assessing each residential and non-residential consumer's water supply system, the Town of Tappahannock shall maintain an up to date inventory of all users, both metered and non-metered.

V. General Responsibilities of the Consumer's Water Supply System Owner

A. The consumer's water supply system owner(s), at their own expense, shall have operational tests made at least annually of backflow prevention assemblies which are required by this program.

B. Operational testing or work shall be performed by Backflow Prevention Device Workers certified by the Virginia Department of Professional and Occupational Regulation, Virginia Board of Contractors under the Tradesman Regulations, to test and repair assemblies. Assembly testing procedures shall be

those acceptable to the DPOR, Board for Contractors. Assembly test equipment shall conform to the USC Field Test Kit Standard as test equipment is made available.

C. Until five years from the adoption of this program, individuals who have obtained a certificate of completion of a course of instruction of sixteen hours or more recognized by the Tradesman Regulations may have their work accepted.

D. The consumer's water supply system owner(s) shall cause all backflow prevention assemblies, devices, or backflow elimination methods required under Section IX, to be maintained in good working order and shall not make or cause to be made any piping or other arrangements or modifications for the purpose of bypassing or defeating assemblies, devices or backflow elimination methods.

E. The consumer's water supply system owner(s) shall provide copies of assembly test results, maintenance records, and overhaul records to the Town of Tappahannock within thirty (30) days of completion of such testing or work.

VI. Non-residential Customer Assessments

A. General

The non-residential consumer's water supply system owner will be advised in writing of the results of each assessment, the assigned degree of hazard, and if any preventative and control measures are required or recommended or if any preventative and control measures are required or recommended or if any existing preventative and control measures need attention.

B. Frequency

Assessments of each non-residential consumer's water supply system and a determination of the degree of hazard, if any, to the waterworks will be made at least annually. The Town of Tappahannock may, at his discretion, schedule more frequent assessments at high hazard facilities.

C. Type

Assessments will be conducted by on site interview and voluntary survey or by questionnaire. An initial on site interview will be conducted with the owner or owner's representative of each non-residential consumer's water supply system identified in Section IX. A questionnaire will be sent to each remaining non-residential consumer's water supply stem owner or, at the discretion of the Town of Tappahannock, the questionnaire may be completed by telephone interview. Subsequent assessment type will be determined on a case-by-case basis by the Town of Tappahannock.

D. Assessment by On Site Interview and Voluntary Survey

1. Available information about the premises to be assessed will be gathered prior to the interview.
2. The reasons for cross connection control and backflow prevention will be explained to the consumer's water supply system owner or representative.
3. Interviews will follow a prepared questionnaire used to assess the need for cross connection control by containment.
4. Water uses after it enters the premises will be determined.
5. During these interviews, a request to conduct a voluntary survey will be made and each installed assembly, device, or elimination method will be inspected for appropriateness, proper installation and general appearance.
6. Plans for future expansion and possible additional protection requirements will be discussed.

7. During the voluntary survey of the premises, a determination of the need for point-of-use isolation protection for the protection of the consumer's water supply system users will be made and consideration given to substitution point-of-use isolation protection for containment.

8. All information will be recorded on the prepared questionnaire. This will include water uses, assessment of degrees of hazard and diagrams.

E. Assessment by Mailed Questionnaire

1. The appropriateness, proper installation, and general appearance of each installed assembly, device or elimination method will be evaluated by the consumer's water supply system owner or owner's representative for those facilities where annual questionnaires will be mailed.

2. The results of the annual questionnaires will be reviewed by the Town of Tappahannock to reaffirm the degree of hazard and to assess the facility for new hazards. Based on the response to the questionnaires, cross connection control interviews will be scheduled and appropriate assemblies, devices, or elimination methods required providing containment and/or point-of-use isolation where appropriate.

F. Assessment by telephone interview

1. For those facilities where telephone interviews will be conducted, the questionnaire used for mailings will be completed by the caller to reaffirm the degree of hazard and to assess the facility for new hazards.

2. During these interviews, each installed assembly, device, or elimination method will be discussed and evaluated to determine appropriateness, proper installation, and general appearance. Point-of-use isolation protection will be discussed with the owner.

G. Lack of Response to Assessment

No response to a questionnaire or telephone interview will prompt an on site interview. Refusal of access for interview or provision of pertinent information will prompt the designation of a high hazard premise and the requirement to install a high hazard service line containment assembly or backflow elimination method.

VII. Residential Customer Self-Assessments

A. In lieu of an annual assessment of residential connections, a continuous public education program will be provided to increase the awareness of cross connections and the public health hazards of backflow. The public education program will be designed to prompt residential customer self-assessments.

B. Public Education:

The public education program will be a continuous program targeted to the residential customer and the business and industries serving the residential dwelling market, both rental and purchase. The cross connection control and backflow prevention program public education program will include:

1. A discussion of the conditions that lead to backflow
2. Residential plumbing hazards having the potential for cross connections and backflow
3. Health effects of cross connections and backflow
4. Public education materials and methods of delivery
5. Clubs, organizations, civic organizations, school system, etc. where public education programs are presented or provided and program content
6. Guidance/resources to identify actual or potential cross connections
7. Preventative and control measures to control or eliminate the hazards at the point-of-use
8. Contact information for assistance
9. Sources or additional information

VIII. Prevention and Elimination Measures for Containment – Location

A. Service Connection Containment

A backflow prevention assembly or backflow elimination method shall be installed at the service connection to a consumer's water supply system where, in the judgment of the Town of Tappahannock a health, pollitional, or system hazard to the waterworks exists or may exist.

B. Containment Beyond the Service Connection

When, as a matter of preference or practicality, the backflow prevention assembly or backflow elimination method may be located downstream of the service connection but prior to any unprotected takeoffs. Inside the building is the preferred location.

C. Point-of-use Isolation in Lieu of Service Connection Containment

Where, in the judgment of the Town of Tappahannock, all actual or potential cross connections can be easily abated or controlled at each point-of-use and where the consumer's water supply system is not intricate or complex, point-of-use isolation protection by application of appropriate backflow prevention assemblies or devices or backflow elimination methods may be applied in lieu of installing a backflow prevention assembly or backflow elimination method at the service connection. Table 2, Assembly and Device Application, shall be used as a guide to determine the appropriate backflow assembly or device where point-of-use isolation protection is being applied in lieu of service line containment.

D. The location of service line containment assemblies or backflow elimination methods will be determined by property survey, where necessary. Containment measures serving public building or other public facilities may be located on public property.

E. Where the assembly or backflow elimination method will be located within the jurisdiction of the Local Building Official, it must be located prior to any unprotected takeoffs. The Local Building Official will be advised and concur prior to installation.

IX. Prevention and Elimination Measures for Containment – Where required

A. A backflow prevention assembly or backflow elimination method shall be installed where any of the following conditions exist. The type of assembly or method required shall depend on the degree of hazard determined according to Table 1, Determination of Degree of Hazard.

1. Premises on which any substance is handled in such a manner as to create an actual or potential hazard to the waterworks (this shall include premises having auxiliary water systems or having sources or systems containing process fluids or waters originating from the waterworks which are no longer under the control of the Town of Tappahannock.
2. Premises having internal cross connections that, in the judgment of the Town of Tappahannock may not be easily correctable or having intricate plumbing arrangements that make it impracticable to determine whether or not cross connections exist.
3. Premises where, because of security requirements or other prohibitions or restrictions, it is impossible or impractical to make an assessment of all cross connection hazards having the potential for impairing the quality of the water as delivered.
4. Premises having a repeated history of cross connections being established or reestablished
5. Premises having fire protection systems, lawn sprinkler system, or irrigation systems.

6. Premises having frost proof yard hydrants, drinking fountains or other appurtenances or plumbing fixtures with below-grade weep holes subject to contamination.

7. Other premises having conditions specified by the Town of Tappahannock where cause can be shown that a potential cross connection hazard not enumerated above exists.

B. Premises having booster pumps or fire pumps connected directly to the waterworks or indirectly through a service connection shall have the pumps equipped with a pressure sensing device to shut off or regulate the flow from the pumps when the pressure at any service connection in the distribution system drops below the minimum working pressure required of 20 psi. In no case shall the pressure sensing device be set lower than 10 psi gauge.

C. As per language an approved backflow prevention assembly or backflow elimination method shall be installed at, but not necessarily limited to, the following types of facilities:

1. Hospitals, mortuaries, clinic, veterinary establishments, nursing homes, dental offices and medical buildings;

2. Laboratories;

3. Piers, docks, waterfront facilities;

4. Sewage treatment plants, sewage pumping stations, or storm water pumping stations;

5. Food and beverage processing plants;

6. Chemical plants, dyeing plants and pharmaceutical plants;

7. Metal plating industries;

8. Petroleum or natural gas processing or storage plants;

9. Radioactive materials processing plants or nuclear reactors;

10. Car washes and laundries;

11. Water loading stations;

12. Lawn care companies and their vehicles with storage or mixing tanks;

13. Slaughter houses and poultry processing plants;

14. Farms where the water is used for other than household purposes;

15. Commercial greenhouses and nurseries;

16. Health clubs with swimming pools, therapeutic baths, hot tubs, or saunas;

17. Paper and paper products plants and printing plants;

18. Pesticide or exterminating companies and their vehicles with storage or mixing tanks;

19. Schools or colleges with laboratory facilities;

20. High-rise buildings (4 or more stories);

21. Multi-use commercial, office, or warehouse facilities;

22. High density, multi-use residential complexes served through a master meter

23. Other specified by the Town of Tappahannock when reasonable cause can be shown for a potential backflow or cross connection hazard

D. Where lawn sprinkler systems, irrigation systems or fire protection systems are connected directly to the waterworks with a separate service connection, a backflow prevention assembly or backflow elimination method shall be installed.

E. All temporary or emergency service connections shall be protected where in the judgment of the Town of Tappahannock a health, pollution or system hazard to the waterworks exists or may exist for a potential backflow or cross connection hazard.

X. Type of Protection Required

A. The type of protection required shall depend on the degree of hazard, which exists or may exist. The degree of hazard, either high, moderate, or low, is based on the nature of the contaminant; the potential health hazard; the method of backflow (either by backpressure or by backsiphonage); and the potential

effect on the waterworks structures, equipment, and appurtenances used in the storage, collection, purification, treatment, and distribution of pure water. Table 1 shall be used as a guide to determine the degree of hazard for any situation.

B. Backflow elimination methods, which include the air gap physical disconnection and discontinuance or refusal of service, give the highest degree of protection and shall be used whenever practical to do so in high hazard situations subject to backpressure.

C. An air gap, a physical disconnection, a reduced pressure principle backflow prevention assembly (RP or RPZ) or discontinuance or refusal of service will protect against backpressure and backsiphonage.

D. The reduced pressure principle backflow prevention assembly shall be used in high hazard situations subject to backpressure where it is impractical to eliminate the cross connection by an air gap or physical disconnection.

E. Pressure vacuum breaker assemblies (PVB) will not protect against backpressure, but will protect against backsiphonage. Pressure vacuum breakers may be used in low, moderate or high hazard situations subject to backsiphonage only.

F. A double gate-double check valve assembly (DG-DC) will protect against backpressure and backsiphonage but it shall not be used in high hazard situations.

G. Backflow prevention devices consisting of dual independent check valves with or without an intermediate atmospheric vent shall only be used in low hazard situations.

H. Barometric loops are not acceptable.

I. Interchangeable connections or changeover devices are not acceptable.

XI. Approved Backflow Prevention Assemblies, Devices and Backflow Elimination Methods for Containment.

A. Backflow prevention assemblies for containment shall be the reduced pressure principle backflow prevention assembly, the double gate double check valve assembly, and the pressure vacuum breaker assembly.

B. Backflow elimination methods shall be an air gap, physical disconnection or discontinuance or refusal of service. The minimum air gap shall be twice the effective opening of a portable water outlet unless the outlet is a distance less than three times the effective opening away from a wall or similar vertical surface, in which case the minimum air gap shall be three times the effective opening of the outlet. In no case shall the minimum air gap be less than one inch. Physical disconnection and discontinuance or refusal of service eliminates any connection, direct or indirect, between a waterworks and a nonportable or questionable quality system.

C. Backflow prevention assemblies shall conform to the latest available American Water Works Association (AWWA) standards; shall hold current University of Southern California Foundation for Cross Connection Control and Hydraulic Research (USC) approval; and shall be listed by the American Society of Sanitary Engineers (ASSE).

D. Backflow prevention assemblies shall be installed, maintained, and repaired in accordance with the University of Southern California Foundation for Cross Connection Control and Hydraulic Research (USC) and the manufacturer's instructions. Orientation of the assembly shall be as approved by the USC.

E. For the purpose of application of point-of-use isolation protection in lieu of service line containment, assemblies or devices or backflow elimination methods shall be as specified by the Town of Tappahannock where reasonable assurance can be shown that the assembly, device or method will protect the waterworks. As a minimum, devices used in point-of-use isolation shall be listed by the American Society of Sanitary Engineering (ASSE) and comply with the uniform Statewide Building Code. Assemblies used in point-of-use isolation shall be in compliance with Section XI C. and D. See Table 2, Assembly and Device Application.

F. Backflow prevention devices or assemblies with openings, outlets or vents that are designed to operate or open during backflow prevention shall not be installed in areas subject to flooding or in pits and shall be installed in free atmosphere.

G. Backflow prevention devices or assemblies shall not be subjected to operating conditions of working pressure, backpressure, temperature, or flow rate which exceed the test conditions of the performance evaluation standard under which the device is listed (ASSE) or the assembly is approved (USC)

XII. Inventory

An inventory will be maintained of all required backflow prevention assemblies and devices and backflow elimination methods including all backflow prevention assemblies, devices, and backflow elimination methods installed as a result of residential customer self-assessments.

XIII. Testing

A. The schedule of testing of all required backflow prevention assemblies shall not exceed one (1) year. The Town of Tappahannock may, at its discretion, schedule more frequent testing at high hazard facilities and at facilities scheduled to upgrade the type of protection.

B. The operational testing schedule will include all backflow prevention assemblies installed as a result of residential customer self assessments.

C. The Town of Tappahannock will review and track the cross connection control operational verification reports and notify the consumer's water supply system owner in writing as to the testing requirements sixty (60) days prior to their due date.

D. Copies of test results, maintenance records, and overhaul records will be reviewed for completeness and accuracy and a determination as to pass or fail made. The Town of Tappahannock will notify the consumer's water supply system owner within ten (10) working days of receipt of such testing or work and of its acceptance.

XIV. Backflow Events

In the event of the backflow of pollution or contamination into the waterworks, the Town of Tappahannock will promptly take or cause corrective action to confine and eliminate the pollution or contamination. The Town of Tappahannock will report to the appropriate Commonwealth of Virginia, Department of Health, Office of Drinking Water, Field Office in the most expeditious manner (usually by telephone) when backflow occurs and will submit a written report by the 10th day of the month following the month during which backflow occurred. The report will address the incident, its causes, effects, and preventative or control measures required or taken.

XV. Consumer Notification

The Town of Tappahannock will notify the consumer's water supply system owner in writing as to the required location of any assembly, device, or backflow elimination method; type of assembly, device, or backflow elimination method, including applicable University of Southern California Foundation for Cross Connection Control and Hydraulic Research (USC) American Society of Sanitary Engineering (ASSE) and American Water Works Association (AWWA) approvals, listing, or standards; installation requirements; and the deadline for completing the installation, usually fifteen (15) days.

If the consumer's water supply system owner fails to install any required assembly, device or backflow elimination method within the deadline or fails to complete testing, inspecting or overhauling as required, a second notification will be prepared and will include a notification of discontinuance of water service unless compliance is obtained within thirty (30) days.

XVI. Records

Records of voluntary surveys and inspections of backflow prevention assemblies or devices or backflow elimination methods; test results of backflow prevention assemblies; assessments of consumer water supply systems; and backflow incidence reports, for residential and nonresidential customers will be maintained by the Town of Tappahannock for ten years. Continuous public education program records will be maintained by the Town of Tappahannock for ten years. Continuous public education program records will include: education materials and methods of delivery; other educational activities; and documentation of all public contacts including assistance provided.

XVII. 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 consumer's water supply system is not intricate or complex, point-of-use isolation protection by application of appropriate backflow prevention assemblies, devices or elimination methods may be used in lieu of installing a containment device at the service connection if the following conditions are met.

A. The method of protection provided shall be, in the judgment of the Town Manager or his designee the method which best provides protection; and

B. The consumer's water supply system owner grants access for inspections; and makes a request in writing for point-of-use isolation protection; and

C. The Local Building Official concurs

D. Assemblies, devices, or elimination methods installed under this section will be selected from *Table 2 – Assembly and Device Application*.

Point-of-use isolation protection applied in lieu of service line containment will be in accordance with the Memorandum of Agreement between the Department of Housing and Community Development and the Department of Health. See attachments.

XVIII. Pressure Sensing Devices

Hydraulic analysis will be used to determine the set point of required pressure sensing devices used to shut off or regulate the flow from pumps connected directly or indirectly to the distribution system. The device shall be set at the service connection pressure which corresponds to the minimum working pressure required at the critical node in the affected distribution system subsystem. See *Waterworks Regulations Section 12 VAC 5-590-690 C*. for minimum working pressure requirements. In no case shall the pressure sensing device be set lower than 10 psi gauge.

XIX. Ensuring Backflow Assemblies Hold Current Approval

The Town of Tappahannock will ensure that all backflow prevention assemblies hold current approval by the University of Southern California Foundation for Cross Connection Control and Hydraulic Research (USC). The consumer's water supply system owner will be notified of any USC Special Notice which may affect the status of an installed assembly.

XX. Temporary or Emergency Connections and Water Loading Stations

Requests for temporary or emergency service connections and temporary or permanent water loading stations will be directed to the Town of Tappahannock for approval. The Town of Tappahannock will perform periodic inspections of these facilities.

XXI. Coordination

A. The Town of Tappahannock will route through the Local Building Official all new plans for service connections to serve fire service connections, lawn sprinkler systems or irrigation systems and will route through the Local Building Official all backflow prevention recommendations beyond the service connection.

B. The Town of Tappahannock will ensure coordination between the Town of Tappahannock and the Local Building Official of cross connection control requirements at new premises, premises where usage has changed, premises where booster or fire pumps are used and all others where plumbing modifications occur.

C. Required assemblies shall be tested and inspected and required elimination methods shall be inspected by the Town of Tappahannock prior to issuance of a certificate to occupy.

D. A follow up test and inspection of required assemblies will be performed by the Town of Tappahannock within thirty (30) days of occupancy.

XXII. Premises with Individual Water Supplies

A. Premises with individual water supplies requesting a new service connection or reconnection to the waterworks will be assessed by on site interview for cross connection hazards and the appropriate backflow elimination method installed, inspected, and operational prior to making the service connection.

B. Premises with individual water supplies, i.e., an auxiliary water system, may, upon approval of the Town of Tappahannock, maintain the water supply on the premises if the auxiliary water system is physically disconnected from the consumer's water supply system. Maintenance of the physical disconnection and access must be included in the Waterworks User Agreement. The Local Building Official's concurrence will be needed.

C. Subsequent assessment type will be determined on a case-by-case basis by the Town of Tappahannock. Assessments will be conducted to verify the maintenance of the physical disconnection.

XXIII. Records

A. An up-to-date listing of all customers (users, metered and non-metered) will be maintained by the Town of Tappahannock. The list will contain:

1. Owner of premises
2. Tenant
3. Name of premises
4. Service Address
5. Phone number
6. Contact Person

7. Number of service connections
8. Size of service connection
9. Assessment type: (on site interview) (mailed questionnaire) (telephone interview)
10. Assigned degree of hazard
11. Assessment frequency

B. An up-to-date listing of consumer's water supply system owners who have cross connection preventative and control measures installed will be maintained by the Town Manager or his designee. The list will contain:

1. Owner of premises
2. Tenant
3. Name of premises
4. Service address
5. Phone number
6. Contact person
7. Location of cross connection preventative and control measures
8. Type of preventative and control measures (service line containment) (point-of-use isolation) isolation in lieu of containment)
9. Type of protection (USC assembly) ASSE devise) (pressure sensing device) (air gap) (physical disconnection)
10. Manufacturer
11. Model Number
12. Serial number
13. Size
14. ASSE number
15. Testing frequency (annually) (semi annually) quarterly)
16. Pressure sensing device pressure set pint
17. Basis for pressure sensing device pressure set point
18. Access granting documentation (on file) (denied) not necessary)

C. An up-to-date listing of consumer's water supply system owners who have an auxiliary water system available to the premises. In addition to the applicable records note above, the water usage records will be reviewed to determine if the auxiliary water system is being used.

D. Questionnaires will be maintained by the Town of Tappahannock for ten (10) years. The questionnaire will contain:

1. Owner and address of residence
2. Occupant if different from owner
3. Telephone number
4. Brief explanation of the program
5. Brief explanation of causes of backflow and preventative and control measurers
6. Some likely cross connections:
 - A. a garden hose with its outlet submerged
 - b. kitchen sink spray hose with its spray head submerged
 - c. hand-held shower massager with its head submerged
 - d. garden hose used as an aspirator to spray soap or garden chemicals
 - e. spring, hot-tub, cistern or swimming pool connected to the house plumbing system
 - f. water softeners improperly connected

7. Specific questions which will include but not limited to:

- a. individual wells, springs or cistern on the property
- b. pressure booster pumps
- c. water storage tanks
- d. water treatment systems
- e. outside hose bids used in conjunction with:
 - chemical sprayers
 - jet spray washers
 - swimming pools, hot tubs, saunas, etc
 - lawn sprinkler or irrigation system
- f. photographic developing
- g. utility sinks with hoses extending below sink rim
- h. animal watering troughs

8. existing cross connection control preventative and control measures:

- a. working properly
- b. leaking, noisy
- c. any modification or repair made
- d. date of last test
- e. any problems with hot water tank relief valve or faucet washers not lasting very long

9. also included with the questionnaire should be:

- a. education material
- b. who to contact for further information
- c. who to contact if contamination is ever suspected
- d. a deadline to respond to the questionnaire

E. Assessment reports shall be maintained by the Town of Tappahannock for ten (10) years. The report will contain:

1. inventory information as noted above
2. completed questionnaire
3. assessment report of:
 - a. degree of hazard
 - b. appropriateness of assembly, device, or backflow elimination method
 - c. installation acceptable
 - d. general condition of device or backflow elimination method
 - e. repair/replacement recommendations
 - f. new/additional assembly, device, or backflow elimination method recommendations
 - g. any indication of thermal expansion problems

F. Testing reports shall be maintained by the Town of Tappahannock for ten (10) years.

Testing reports will contain:

1. inventory information as noted above
2. line pressure
3. results of testing
4. test method used
5. date, signature, and certification number of the Backflow Prevention Device Worker
6. If repairs were made, the test report will contain:
 - a. which parts replaced
 - b. replacement parts used

- c. probable cause of test failure
- d. preventative measures taken

XXIV. Assembly, Device, and Backflow Elimination Method Selection Guidelines

- a. Virginia Cross Connection Control Association – Recommended Best Practice
- b. International Plumbing Code and its Commentary
- c. EPA *Cross-Connection Control Manual*
- d. *Virginia Waterworks Regulations*
- e. AWWA M-14 Cross Connection Control Manual
- f. University of Southern California, Foundation for Cross – Connection Control and Hydraulic Research

XXV. Examples:

Types of facilities, probable degree of hazard and type of containment assembly required. All containment assemblies will comply with AWWA Standards, be approved for containment by the USC, and be listed by the ASSE. In high hazard situations subject to backpressure, backflow prevention by an elimination method should be the method of choice, wherever practical.

- A. Hospitals, mortuaries, clinics, veterinary establishments, dental offices, nursing homes, and medical buildings: High hazard, Reduce Pressure Principle Device (RPZ) ASSE#1013
- B. Laboratories: High hazard, Reduced pressure Principle Device (RPZ) ASSE #1013
- C. Piers, docks, waterfront facilities: High hazard, Reduced Pressure Principle Device (RPZ) ASSE#1013
- D. Sewage treatment plants, sewage pumping stations, or storm water pumping stations: High hazard, Reduced Pressure Principle Device (RPZ) ASSE #1013
- E. Food and beverage processing plants: Generally, a moderate hazard, Double-Gate-Double Check Valve Assembly (DG-DC) ASSE#1015; Use of toxics, etc. in processing: High hazard, Reduced Pressure Principle Device (RPZ) ASSE #1013
- F. Chemical plants, dyeing plants and pharmaceutical plants: High hazard, reduced pressure principal device (RPZ) ASSE#1013
- G. Metal plating industries: high hazard, reduced pressure principle device (RPZ) ASSE #1013
- H. Petroleum processing or storage plants: high hazard, reduced pressure principle device (RPZ) ASSE#1013
- I. Radioactive materials processing plants or nuclear reactors: high hazard, reduced pressure principle device (RPZ) ASSE#1013
- J. Car washes and laundries: High hazard, reduced pressure principle device (RPZ) ASSE#1013
- K. Water loading stations: High hazard, air gap physical disconnection or reduced pressure principle device (RPZ) ASSE#1013
- L. Lawn sprinkler systems, irrigation systems: High hazard, reduced pressure principle device (RPZ) ASSE#1013 or Atmospheric Vacuum Breakers (AVB) ASSE#1001 or Pressure Vacuum Breaker (PVB) ASSE #1020, depending on method of backflow and pressure or flow conditions
- M. Fire service system: High hazard, Reduced Pressure Principle Device (RPZ) ASSE#1013
- N. Slaughter houses and poultry processing plants: High hazard, Reduced Pressure principle Device (RPZ) ASSE#1013
- O. Farms where the water is used for other household purposes: High hazard, Reduced pressure Principle Device (RPZ) ASSE31013
- P. Commercial greenhouses and nurseries: High hazard, Reduced Pressure Principle Device (RPZ) ASSE#1013
- Q. Health clubs with swimming pools, therapeutic baths, hot tubs or saunas: High hazard, Reduced Pressure Principle Device (RPZ) ASSE #1013
- R. Paper and paper products plants and printing plants: High hazard, Reduced Pressure Principle Device (RPZ) ASSE#1013

- S. Pesticide or exterminating companies and their vehicles with storage or mixing tanks: High hazard, Reduced pressure Principle Device (RPZ) ASSE#1013 at service connection and on vehicles
- T. Schools or colleges with laboratory facilities: High hazard, Reduced pressure Principle Device (RPZ) ASSE#1013
- U. High-rise buildings (4 or more stories): Unless otherwise covered, Moderate hazard, Double Gate-Double check Valve Assembly (DG-DC) ASSE #1015
- V. Multiuse commercial, office, or warehouse facilities: Unless otherwise covered, Moderate hazard, Double Gate – Double check Valve Assembly (DG-DC) ASSE# 1015
- W. High-density, multi-use residential complexes served through a master meter: Unless otherwise covered, Moderate hazard, Double-Gate-Double Check Valve Assembly (DG-DC) ASSE#1015

XXVI. Assembly, Device, and Backflow Elimination Method Testability/Serviceability

- A. Containment or point-of-use isolation assemblies used within the consumer's water supply system that are capable of being tested and repaired in-line include the Reduced Pressure Principle Device (RPZ), Double Gate – Double Check Valve Assembly (DG-DC) & Pressure Vacuum Breaker (PVB)
- B. Residential Dual Checks without an intermediate atmospheric vent and Boiler Dual Checks with an intermediate atmospheric vent are testable but most of these ASSE listed devices must be removed for testing. Some can be overhauled in-line.
- C. Generally, a visual inspection is only means to inspect most Hose Bibb Vacuum Breakers (HBVBs) since they can not be removed if installed in accordance with the manufacturer's instructions. Some manufacturers do provide frost proof wall hydrants with HBVBs which can be easily removed for inspection and replacement.
- D. Pipe connection Atmospheric Vacuum Breakers (AVBs) can be inspected by removing the top cover.
- E. Air gaps, physical disconnection and discontinuance or refusal of water service required only a visual inspection.

XXVII. Thermal Expansion

Customers will be advised of the potential for thermal expansion prior to or during installation of a backflow prevention device. Solutions to thermal expansion will be at the discretion of the consumer's water supply system owner and at the expense of the consumer's water supply system owner.

XXVIII. Definitions

As used in this program, the words and terms shall be as defined in the Commonwealth of Virginia, State Board of Health, *Waterworks Regulations 2005*, or as amended.

XXIX. Attachments

- A. Table 1, Determination of Degree of Hazard
- B. Table 2, Assembly and Device Application
- C. Typical Installation sketches
- D. Education Literature
- E. Questionnaire
- F. Test Form
- G. Back Flow Line Pressure Form