APPENDIX T

CROSS CONNECTION CONTROL PROGRAM

2014 Water Division
Cross-Connection Control Program

Purpose:

This document establishes minimum standards for the City of Auburn Cross-Connection Control Program to protect the public water system, as defined in WAC 246-290-010, from contamination via cross-connections. It describes minimum Cross-Connection Control Program operating policies, provides guidelines for installation, testing and maintenance of approved backflow prevention assemblies, permitting process, inspection and survey requirements for existing and new water service connections.

The City's proactive and ongoing Cross-Connection Control Program is an effort to protect the health of its consumers by preventing contaminants and pollutants from entering the public water supply. Washington State Department of Health, Division of Drinking Water requires all public water systems to implement a Cross-Connection Control Program. Elements of the city's Cross-Connection Control Program must be documented and included in the Comprehensive Water System Plan. Washington Administrative Code WAC 246.290.490 mandates Cross-Connection Control Programs contain the following minimum elements:

- Element 1: The purveyor shall adopt a local ordinance, resolution, code, bylaw, or other written legal instrument that:
  (i) Establishes the purveyor's legal authority to implement a cross-connection control program;
  (ii) Describes the operating policies and technical provisions of the purveyor's cross connection control program; and
  (iii) Describes the corrective actions used to ensure that consumers comply with the purveyor's cross-connection control requirements.

  The City of Auburn has adopted ordinance 5851 amending Auburn City Code Chapter 13.12 entitled "Protection of Water Supply" which establishes the City's authority for implementing the Cross-Connection Control Program.

The Federal Safe Drinking Water Act of 1974 and the statutes of the State of Washington, Title 43 RCW, require purveyors to protect the public water supply from contamination.

Enforcement of this Cross-Connection Control Program in the area(s) served by the City of Auburn Water will be in accordance with:

- *Washington Administrative Code WAC 246-290-490, Cross-Connection Control, effective April 9, 1999;*
- *Auburn City Code, ACC1.20.010 Right of entry for Inspection*
- *Auburn City Code, ACC13.06.260 Service Premises Isolation*
- *Auburn City Code, ACC13.12 Protection of Water Supply*
- *Auburn Design Standards 7.01.4 Cross Connection Control*
- *Auburn Construction Standards Water 21, 22, 23, 24*
- *City of Auburn Water Division, Cross-Connection Control Program;*

and/or any subsequent revisions, together with any future manuals of standard practice pertaining to Cross-Connection Control approved by Washington State Department of Health, Division of Drinking Water.

Consumers and/or premises violating any provisions of this document and/or subsequent revisions shall be subject to enforcement action such as, but not limited to, a maximum penalty of $250.00 each day and/or discontinuance (TURN OFF) of water service to the premises.

- Element 2: The purveyor shall develop and implement procedures and schedules for evaluating new and existing service connections to assess the degree of hazard posed by the consumer's premises to the purveyor's distribution system and notifying the consumer within a reasonable time frame of the hazard evaluation results. At a minimum, the program shall meet the following:
  (i) For connections made on or after April 9, 1999, procedures shall ensure that an initial evaluation is conducted before water service is provided;
  (ii) For all other connections, procedures shall ensure that an initial evaluation is conducted in accordance with a schedule acceptable to the department; and
  (iii) For all service connections, once an initial evaluation has been conducted, procedures shall ensure that periodic reevaluations are conducted in accordance with a schedule acceptable to the department and whenever there is a change in the use of the premises.

  The City's Cross-Connection Control Program evaluation of new and existing connections is as follows: New connections must comply with the City's Design Standards 7.01.4 Cross Connection Control, the City's Construction Standards Water 21, 22, 23, 24, and evaluated by the City's Cross-Connection Control Specialist during the permit and plan review process and before service is provided. Water service connection(s) to new consumers and/or premises shall be locked off until the City's Cross-Connection Control Specialist has conducted an inspection of the installation and received a passing valid test report.

Existing connections are given a risk assessment by the City's Cross-Connection Specialist to determine if the backflow protection is commensurate with the degree of hazard. A preliminary assessment (site survey) is conducted on all non-single family facilites for the purpose of determining the need for premises isolation used for the protection of the City's public water supply. City has identified Table 9 (high hazard) facilities within its jurisdiction and has a prioritize list for surveying each site. Consumers and/or premises identified as Table 9 (high hazard) facility and/or non-single family facility require premises isolation with an Approved Air Gap and/or Reduced Pressure Backflow Assembly used for the protection of the public water supply.

After the initial risk assessment of new and existing connections is conducted, a re-evaluation of the service connection is conducted every five (5) years.

The cost/fees of installation, initial and annual testing, maintenance, and repair or replacement of the backflow assembly shall be the responsibility of the consumer as a condition of water service.

- Element 3: The purveyor shall develop and implement procedures and schedules for ensuring that:
  (i) Cross-connections are eliminated whenever possible;
  (ii) When cross-connections cannot be eliminated, they are controlled by installation of approved backflow preventers commensurate with the degree of hazard; and
  (iii) Approved backflow preventers are installed in accordance with the requirements of subsection (6) of this section.

  The City's Cross-Connection Control Program endeavors to eliminate all actual or potential physical Cross-Connections where possible, and not allow any actual or potential physical Cross-Connections unless protected by an Approved Air Gap and/or Reduced Pressure Backflow Assembly. The City's Cross-Connection Program will inventory and track all backflow prevention assemblies used for the protection of the public water supply. It is the consumer and/or premises responsibility to test, maintain, repair, or replace all backflow prevention assemblies used for the protection of the public water supply.

- Element 4: The purveyor shall ensure that personnel, including at least one person certified as a CCS, are provided to develop and implement the cross-connection control program.

  The City's Cross-Connection Control Program employs State Certified personnel. The program currently staffs (2) two full time employees certified as Cross-Connection Control Specialist, Backflow Assembly Tester, and Water Distribution Manager.

- Element 5: The purveyor shall develop and implement procedures to ensure that approved backflow preventers relied upon to protect the public water system are inspected and/or tested (as applicable) under subsection (7) of this section.
  Subsection (7) Approved backflow preventer inspection and testing.
  (a) For backflow preventers that protect the public water system, the purveyor shall ensure that:
  (i) A CCS inspects backflow preventer installations to ensure that protection is provided commensurate with the assessed degree of hazard;
  (ii) Either a BAT or CCS inspects:
  (A) Air gaps installed in lieu of approved backflow prevention assemblies for compliance with the approved air gap definition; and
  (B) Backflow prevention assemblies for correct installation and approval status.
  (iii) A BAT tests approved backflow prevention assemblies for proper operation.
  (b) The purveyor shall ensure that inspections and/or tests of approved air gaps and approved backflow assemblies that protect the public water system are conducted:
  (i) When any of the following occur:
  (A) Upon installation, repair, reinstallation, or relocation of an assembly;
  (B) Upon installation or replumbing of an air gap;
  (C) After a backflow incident involving the assembly or air gap; and
  (ii) Annually thereafter, unless the purveyor requires more frequent testing for high hazard premises or for assemblies that repeatedly fail.
  (c) The purveyor shall ensure that inspections of AVBs installed on irrigation systems are conducted:
  (i) At the time of installation;
  (ii) After a backflow incident; and
  (iii) After repair, reinstallation, or relocation.
  (d) The purveyor shall ensure that approved backflow prevention assemblies are tested using procedures acceptable to the department, such as those specified in the most recently published edition of the USC Manual. When circumstances, such as, but not limited to, configuration or location of the assembly, preclude the use of USC test procedures, the purveyor may allow, on a case-by-case basis, the use of alternate (non-USC) test procedures acceptable to the department.
  (e) The purveyor shall ensure that results of backflow prevention assembly inspections and tests are documented and reported in a manner acceptable to the purveyor.
  (f) The purveyor shall ensure that an approved backflow prevention assembly or AVB, whenever found to be improperly installed, defective, not commensurate with the degree of hazard, or failing a test (if applicable) is properly reinstalled, repaired, overhauled, or replaced.
  (g) The purveyor shall ensure that an approved air gap, whenever found to be altered or improperly installed, is properly replumbed or, if commensurate with the degree of hazard, is replaced by an approved RPBA.

The City's Cross-Connection Control Program requires all backflow prevention assemblies used for the protection of the public water supply be tested and/or inspected at time of installation, annually (yearly anniversary date), after a backflow incident, repair, reinstallation, or relocation. Consumers and/or premises are responsible for all cost/fee to test, maintain, repair, or replace backflow prevention assemblies used for the protection of the public water supply. Consumers and/or premises are also responsible for submitting all passing, valid test reports for backflow prevention assemblies used for the protection of the public water supply to the City's Cross-Connection Control Program within 30 days of testing the backflow preventions assemblies. Test reports received over the 30 days grace period may be returned to the consumers and/or premises for re-testing of the backflow prevention assemblies. Person testing the backflow prevention assemblies shall be a current State Certified Backflow Assembly Tester and have completed the City's Annual Tester Agreement Form. Only test reports approved by City of Auburn shall be accepted. Test reports not approved for use by the City of Auburn shall be returned to the consumers and/or premises. Test report forms shall be complete, accurate, and legible.

Procedures for inspection and/or testing of backflow prevention assemblies for existing consumers and/or premises are as follows:

Annual Testing

The City mails notices to existing consumers and/or premises of the annual testing or re-testing of the backflow prevention assemblies used for the protection of the public water supply. The First Notice is mailed 30 days prior to anniversary test due date. If passing, valid test reports are not received by anniversary test due date then a Second Notice is mailed giving the consumers and/or premises 15 days to test the backflow prevention assemblies. A Third Notice is mailed if passing, valid test reports are not received from the consumers and/or premises by date given on second notice. The third notice gives the consumers and/or premises 7 days to test the backflow prevention assemblies. If a passing, valid test reports are not received, then enforcement action is taken which includes, but is not limited to, a $250.00 fine each day and/or discontinuance (TURN OFF) of water service.

Repair, Reinstallation, or Relocation Testing

The City mails notices to existing consumers and/or premises of the repair, reinstallation, or relocation for the testing of the backflow prevention assemblies used for the protection of the public water supply. Failure notices for backflow assemblies used for high health hazards and non-single family facilities are as follows: The First Notification is mailed after receiving written notice from the backflow assembly tester identifying the failed test, reinstallation or relocation of the backflow assembly. A passing, valid test reports showing the repairs made and/or initial testing of the reinstalled or relocated backflow assembly must be received within 7 days of the written notice. If a passing, valid test reports is not received within the 7 days, then a Second Notification is mailed giving the consumers and/or premises 5 days to submit a passing, valid test reports showing the repairs made with passing results, and/or initial testing of the reinstalled or

relocated backflow assembly. If a passing, valid test reports is not received within the 5 days, then a Third Notification is mailed giving the consumers and/or premises 3 days to submit a passing, valid test reports showing the repairs made and/or initial testing of the reinstalled or relocated backflow assembly. If a passing, valid test reports are not received, then enforcement action is taken which includes, but is not limited to, a $250.00 fine each day and/or discontinuance (TURN OFF) of water service.

Procedures for inspection and/or testing of backflow prevention assemblies for new consumers and/or premises are as follows:

Initial Testing & Inspection of Backflow Prevention Assemblies
The consumer, contractor, and/or premises is required to comply with the City's Design Standards 7.01.4 Cross Connection Control, City's Construction Standards Water 21, 22, 23, 24, and evaluated by the City's Cross-Connection Control Specialist during the permit and plan review process and before service is provided. A Backflow Assembly Permit (BFL) shall be issued for all backflow prevention assemblies used for the protection of the public water supply. The backflow prevention assemblies shall be tested by a current State Certified Backflow Assembly Tester, approved to test within the City's water distribution system. The City's Cross-Connection Control Specialist shall inspect the installation on the backflow prevention assemblies and collect all passing, valid test reports certifying the backflow prevention assemblies are functioning correctly. The Backflow Assembly Permit (BFL) is then finalized in CRW. The City's Cross-Connection Control Specialist may require corrections and/or additions during the inspection process. If so, corrections and/or additions shall be completed to the satisfaction of the City's Cross-Connection Control Specialist before the permit if finalized.

City Owned Backflow Assemblies
The Cross-Connection Control Program currently test and maintain 160 backflow prevention assemblies within City owned facilities. The City employs (4) four Certified Backflow Assembly Testers, (1) one in the Parks Department and (3) three in the Water Department. The backflow prevention assemblies are tested and inspected annually (anniversary date is May 30th of each year), or more often if needed (type B hydrant meter carts are tested when returned).

Hydrant Meter Permit Regulations
Water quality, accountability, safety, infrastructure reliability and security were the catalyst for creation of the Hydrant Meter Permit Regulations for private party customer withdrawal of water from fire hydrants. (See ACC 13.06.511for requirements)

- Element 6: The purveyor shall develop and implement a backflow prevention assembly testing quality control assurance program, including, but not limited to, documentation of BAT certification and test kit calibration, test report contents, and time frames for submitting completed test reports.

- ***CERTIFIED BACKFLOW ASSEMBLY TESTER***
  1. *Backflow Assembly Tester MUST be currently certified to test in Washington State, complete the City's annual Tester Agreement Form and approved by the City's Cross-Connection Control Program prior to testing any backflow assemblies within the City's Water Distribution System.*

  2. *Certified Backflow Assembly Tester MUST submit the following information before any Test Report Forms will be accepted:*
     - *Copy of the (Current Year) BAT Validation Card issued by Washington State Department of Health.*
     - *Copy of the Current Calibration Certificate for all testing equipment clearly stating whom the testing equipment belongs to and/or is used by.*
     - ***Original Certified Backflow Assembly Tester Agreement Form** completed, signed and dated for the (Current Year). No faxes of this form will be accepted.*
       ***By signing the Tester Agreement, the BAT Tester understands and will abide with the City's Tester Program Requirements**.*
     - *Contact information including company name, address, and phone number(s)*
     - *Auburn Business Registration Number*

  3. *BAT Tester may be asked to demonstrate test procedures using current Backflow Prevention Assemblies Field Test Procedure Approved for Use in Washington State to a Cross Connection Control Specialist and/or Certified Backflow Assembly Tester employed by the City. Failure to abide to this request may result in backflow assembly testing privileges discontinued within the City's Water Distribution System.*

  4. *Tester demonstrating gross negligence or suspected of being fraudulent will be investigated and reported to Washington State Department of Health Certification Office. Test Report Forms from Backflow Assembly Tester under investigation will NOT be accepted and returned to the owner of the assembly.*

  5. *Failure to comply with any part of the City's Tester Program Requirements will result in the Backflow Assembly Test Report Form being rejected and returned to the owner of the assembly, and/or Backflow Assembly testing privileges discontinued within the City's Water Distribution System.*

  6. *Auburn Municipal Code requires business operating within the City limits to obtain a business registration number from the permit center.*

- ***BACKFLOW ASSEMBLY TESTING EQUIPMENT***
  1. *Backflow assembly testing equipment MUST meet all requirements set by Washington State Department of Health.*
  2. *A copy of the Current Calibration Certificate of all testing equipment clearly stating whom the testing equipment belongs to and/or is used by MUST be submitted.*
  3. *Backflow assembly testing equipment suspected of being damaged, malfunctioning and/or fraudulent will require re-calibration and/or repair. The new Calibration Certificate MUST be submitted to the City's Cross Connection Control Program before any Test Report Forms will be accepted.*

- ***BACKFLOW ASSEMBLY TESTING/INSPECTION***
  1. *Tester MUST use current Backflow Prevention Assemblies Field Test Procedures Approved for Use in Washington State. No other test procedures will be accepted.*
  2. *The City's Cross-Connection Control Program MUST be notified of Initial Testing for all New Backflow Assemblies used for the protection of the public water supply. Tester shall provide the Backflow Assembly Permit Number (example BFL14-0000) when notifying of Initial Testing. Backflow Assembly installed within the City's Water Distribution System requires a Backflow Assembly Permit.*
  3. *Initial Inspection of Backflow Assembly will NOT be conducted without a valid Backflow Assembly Permit and Test Report Form. Backflow Assembly Permit will NOT be finalized without a passing, valid test report and site inspection of assembly installation.*
  4. *The City's Cross-Connection Control Program MUST be notified within 24hrs, if a Reduced Pressure Backflow Assembly (RPBA), used for High Hazard Protection, FAILS an initial, annual and/or repeat test.*
  5. *Backflow assemblies MUST have all test ports plugged in areas subject to flooding.*

- ***BACKFLOW ASSEMBLY TEST REPORT FORMS***
  1. *Only test reports approved by **City of Auburn** shall be accepted. (NO OTHER TEST REPORT WILL BE ACCEPTED WITHOUT PRIOR APPROVAL) Tester MUST contact the City's Cross-Connection Control Program for prior approval of private Test Report Form. Private Test Report Form MUST used the same format as the City's approved Test Report Form. Test Report Form NOT approved will be returned to the owner of the assembly.*
  2. *Backflow Assembly Test Report Form MUST be submitted to the City's Cross Connection Control Program within 30 days of completing the test. Test Report Form over 30 days will NOT be accepted and returned to the owner of the assembly.*
  3. *Backflow Assembly Test Report Form MUST be **Complete, Accurate and Legible.***
  4. *Test Report Form MUST have documentation of any repairs, cleaning or flushing of backflow assembly.*

5. *Test Report Form will be returned to the owner of the Backflow Assembly if the tester fails to comply with any part of the City's Tester Program Requirements.*
6. *Test Report Form suspected of being fraudulent will be investigated and reported to Washington State Department of Health Certification Office.*
7. *Test Report Form received from any BAT tester under investigation will be rejected and returned to the owner of the backflow assembly.*

- ***APPROVED BACKFLOW ASSEMBLY TESTER***
  1. *The City's Cross-Connection Control Program mails a BAT Requirement Letter to previously registered tester no later than December 31st of each year. Tester not previously registered with the City's Cross Connection Control Program will receive a BAT Requirement Letter upon request.*
  2. *Tester MUST complete and submit the annual BAT Tester Agreement Form before test reports will be accepted. Testers NOT complying with all parts of the BAT Tester Agreement Form will have testing privileges discontinued within the City of Auburn Distribution System.*
  3. *Tester will NOT be allowed to test backflow assembly within the City's Water Distribution System until all required information is received.*
  4. *Tester NOT registered with the City's Cross-Connection Control Program by the Washington State Department of Health renewal cut-off date, will NOT be allowed to test backflow assembly within the City's Water Distribution System until all required information is received.*
  5. *Tester NOT registered with the City's Cross-Connection Control Program by the Washington State Department of Health renewal cut-off date, will NOT be listed on the City's Approved Tester List given to customers upon request.*
  6. *Tester NOT registered with the City's Cross-Connection Control Program by the Washington State Department of Health renewal cut-off date, will NOT have Test Report Form accepted by the City's Cross-Connection Control Program and returned to the owner of backflow assembly.*
  7. *The City's Cross-Connection Control Program will only list the testers Name, Phone Number(s), and BAT Certification Number on the City's Approved Tester List given to customers upon request.*
  8. *The City's Cross-Connection Control Program will list tester in the order received. Tester will NOT be listed until all information requested is submitted. The City's Approved Tester List does not indicate any preference, is completely at our discretion and subject to space availability.*
  9. *The City's Approved Tester List is updated once a month.*
  10. *The City's Approved Tester List is available as a hard copy or on h-drive under Cross-Connection in electronic form.*
  11. *Tester may request approval to test within the City's Water Distribution System and NOT listed on the City's Approved Tester List.*

- ***BACKFLOW ASSEMBLY TESTER RECORDS & RECORD KEEPING***
  1. *All paperwork received from Tester MUST be date stamped the day they are received.*
  2. *Information from paperwork MUST be date stamped and recorded in Tokay.*

3. *All paperwork received from Tester for the (Current Year) MUST be stapled together and placed into a file folder marked with the company name the Tester is employed by.*
4. *All paperwork MUST be stapled in the following order:*
    - *Original Tester Agreement Form for the (Current Year)*
    - *Copy of the DOH/BAT Validation Card for the (Current Year)*
    - *Copy of the Test Equipment Calibration for the (Current Year)*
5. *All certification paperwork received from Tester MUST be kept for a minimum of two years.*
6. *Paperwork such as questionable Test Report Form, Annual Tester Requirement Letter and/or Department of Health Complaint Form MUST be kept on file for as long as the Tester is Currently Registered in Washington State. (Verify annually on WETRC web-site)*
7. *The following information MUST be recorded in Tokay:*
    - *Assigned Code for new and existing Testers*
    - *Tester Status (active/inactive)*
    - *Company Name, Address and Phone Number(s)*
    - *BAT Certification Number issued by the Department of Health*
    - *"Date stamped" received*
    - *Expiration date for BAT Validation*
    - *Test equipment serial number and calibration date*
    - *Tester Agreement and Customer List Status*
    - *Certification Status*
8. *When all required paperwork is received and recorded, then the Tester name, certification number and phone number(s) is placed on the "City's Approved Tester List distributed to customers upon request". **(This is only for Tester requesting to be on the City's Approved Tester List)***
9. *Tester NOT requesting to be on the City's Approved Tester List will only be track by Tokay.*

- ***BACKFLOW ASSEMBLY TESTER INVESTIGATION/COMPLAINT***
    1. *Cross Connection Specialist MUST notify Supervisor(s) for approval before starting investigation.*
    2. *Send a Certified Letter to the Tester informing them of the intended investigation. (This letter will require the Tester to Stop Testing Backflow Assemblies within the City's Water Distribution System until the investigation is complete and the Tester has been cleared by the City's Cross Connection Control Program in writing (No time frame will be set for investigation).*
    3. *Remove the Tester name, certification number and phone number(s) from the City's Approved Tester List and place status in Tokay as Inactive.*
    4. *Review all Test Report Forms received from Tester for the (Current Year) to look for other discrepancies.*
    5. *Compare previous history of Test Report Forms for each backflow assembly in question.*
    6. *Conduct an on-site investigation and test of each backflow assembly in question.*
    7. *Take pictures and documentation of each backflow assembly in question.*

8. *Review current Backflow Prevention Assemblies Field Test Procedures Approved for Use in Washington State to verify test procedures.*
9. *Review current Backflow Prevention Assemblies Approved for Installation in Washington State to verify status of backflow assembly.*
10. *Require Tester meet a Cross Connection Control Specialist and/or Certified Backflow Assembly Tester employed by the City to demonstrate test procedures using current Backflow Prevention Assemblies Field Test Procedure Approved for Use in Washington State.*
11. *Review findings of investigation with Supervisor(s) and acquire approval to discuss with Tester and Washington State Department of Health*
12. *Review finding of investigation with Tester.*
13. *Tester may submit a written rebuttal to the finding of the investigation after the review with the City's Cross Connection Control Program.*
14. *Review finding of investigation with Washington State Department of Health Certification office. (Fill out State Complaint Form) The State will conduct its own investigation and deliver its finding in writing.*
15. *Review the States finding with Supervisor(s) to determine status of Tester.*
    - *Tester Cleared – Send Certified Letter reinstating testing privileges within the City's Water Distribution System.*
    - *Tester Not Cleared – Send Certified Letter revoking testing privileges within the City's Water Distribution System for as long as the Tester is Currently Registered in Washington State.*
16. *All paperwork from the investigation MUST be kept on file for as long as the Tester is Currently Registered in Washington State*

Tester(s) not complying with any part of the aforementioned requirements shall be removed from the City's Approved Tester List. Test report forms shall be returned to the consumer and/or premises of the backflow prevention assemblies tested. The City reserves the right to deny a Backflow Assembly Tester from performing testing within the City's water distribution system. Tester(s) are responsible for obtaining all certifications needed to perform duties and responsibilities for testing and maintaining backflow prevention assemblies.

- Element 7: Develop and implement (when appropriate) procedures for responding to backflow incidents.

The City's Cross-Connection Control Program has outlined a Backflow Incident Response Procedure to be followed if the City's water supply becomes contaminated or polluted due to a backflow incident.

BACKFLOW INCIDENT RESPONSE PLAN
(Supplement to the Emergency Plan)

General:
This backflow incident response plan is a supplement to the City's Response Emergency Plan. The City of Auburn Water Division is hereinafter referred to as the Purveyor.

- *Whenever the initial evaluation of a water quality complaint indicates that a backflow incident has occurred (potable water supply has been contaminated/polluted), may have occurred, or the reason for the complaint can not be explained as a "normal" aesthetic problem, a backflow incident investigation should be immediately initiated. Whenever a water main break or power outage (pumped systems) causes a widespread loss of water pressure (backsiphonage conditions) it is prudent to initiate a check of distribution water quality as a precursor to the need for a backflow incident investigation. It is wise to be conservative when dealing with public health matters.*

- *Within 24 hours of knowledge of any incident of possible contamination of the potable water supply, both in the distribution system and/or in the customer's plumbing system, the state and local county personnel should be notified (see list of emergency telephone numbers in the Public Works Emergency Response M. & O. Manual).*

- *A backflow incident investigation is often a team effort. The investigation should be made or (initially) lead by a Certified Cross-Connection Control Specialist employed by the Purveyor. The investigation team should include local health and plumbing inspectors.*

General guidance on how to respond to a backflow incident may be obtained from the manual BACKFLOW INCIDENT INVESTIGATION PROCEDURES, First Edition, 1996, published by the Pacific Northwest Section, American Water Works Association, P. O. Box 19581, Portland, Oregon, 97280, telephone (877) 767-2992 (toll free).

Short-List of Tasks:
The following points are included for initial guidance for dealing with a backflow incident; the above referenced manual BACKFLOW INCIDENT INVESTIGATION PROCEDURES should be consulted as soon as possible.

1. *As soon as possible, notify customers not to consume or use water. Start the notification with the customers nearest the assumed source of contamination (usually the customer(s) making the water quality complaint).*

   The customer should be informed about the reason for the backflow incident investigation, and the Purveyor's efforts to restore water quality as soon as possible. State that the customer will be informed when he may use water, the need to boil water used for consumption until a satisfactory bacteriological test result is obtained from the lab, etc.

   Where a customer cannot be contacted immediately, the Purveyor shall place a written notice on the front door handle, and a follow-up visit will be made to confirm that the customer received notice about the break and possible contamination of the water supply.

2. *Give consideration to the distribution system as a potential source of the contaminant (e.g., air valve inlet below ground).*

3. *Do not start flushing the distribution system until the source of contamination is identified. Flushing may aggravate the backflow situation and will likely remove the contaminant before a water sample can be collected to fully identify the contaminant.*

4. *Conduct a house-to-house survey to search for the source of contamination and the extent that the contaminant has spread through the distribution system. A check of water meters may show a return of water (meter running backward).*

5. *Isolate the portions of the system that are suspected of being contaminated by closing isolating valves; leave one valve open to ensure that positive water pressure is maintained throughout the isolated system.*

6. *Be sure to notify all affected customers in the isolated area, then the other customers in the system.*

7. *The public health and plumbing authorities should deal with all customers that may have consumed the contaminant, or had their plumbing systems contaminated.*

8. *Develop and implement a program for cleaning the contaminated distribution system.*

9. *For the customer where a cross-connection responsible for the system contamination is located, the Purveyor should discontinue water service until the Purveyor ordered corrective action is completed by the customer.*

Identification of the source and type of contaminant, and cleaning of a distribution system could take several days.

Most chemical or physical contaminants can be flushed from the water distribution system or customer's plumbing system with adequate flushing velocity. This may not be the case where scale and corrosion deposits (e.g., tuberculation on old cast iron mains) provides a restriction to obtaining adequate flushing velocity, or a chemical deposit or bacteriological slime (biofilm) on which the chemical contaminant may adhere.

To remove a chemical or physical contaminant, it may be necessary to provide a physical cleaning, using foam swabs (pigs), and/or to alter the form or the chemical contaminant, e.g., through oxidation using chlorination, or addition of detergents.

When adding any chemical (including chlorine) to remove a contaminant, it is essential that the chemistry of the contaminant is-fully understood. The wrong chemical reaction could make the contaminant more toxic, more difficult to remove, or both.

Where both a chemical and bacteriological contamination has occurred, disinfection should follow the removal of the chemical contaminant.

Where any bacteriological contamination is suspected, field disinfection should be done. To disinfect water mains using the "slug" or "continuous flow" method, a field unit should be used for chlorine injection, such as a chemical feed - metering or proportioning pump for sodium hypochlorite.

NOTE: Refer to the City's Backflow Incident Response Manual for additional information.

- Element 8: The purveyor shall include information on cross-connection control in the purveyor's existing program for educating consumers about water system operation. The public education program may include periodic bill inserts, public service announcements, pamphlet distribution, notification of new consumers and consumer confidence reports.

  Public education is a key part of the City's Cross-Connection Control Program. Through public education, the City informs consumers of:

  1. *The public health impacts of actual or potential Cross-Connection hazards.*
  2. *The consumer's responsibility to protect the public water supply from contamination.*
  3. *The City's requirement to comply with Washington State Department of Health regulations.*
  4. *The City's policies on Cross-Connection Control.*

  The following educational material is provided to the City's water consumers and available at City Hall, Maintenance & Operations, and by mail if requested.

  - *Annual Consumer Confidence Report CCR*
  - *City of Auburn internet home page, Water Quality*
  - *Brochure – AWWA Caution Your Hose May Be Hazardous To Your Health*
  - *Brochure – USC Working Together For Safe Water*
  - *Brochure – AWWA Residential Fire Sprinkler Systems And Backflow Prevention*
  - *Brochure – AWWA Lawn Irrigation Systems And Backflow Prevention*
  - *Brochure – AWWA Help Protect Your Drinking Water From Contamination (Household Hazards)*
  - *Brochure – AWWA Protect Your Water Heater From Thermal Expansion*
  - *Brochure – AWWA Cross-Connections Can Create Health Hazards*
  - *Comic Books – ABPA Buster Backflow, book 1 & 2*

- Element 9: The purveyor shall develop and maintain cross-connection control Records including, but not limited to, the following:
  (i) A master list of service connections and/or consumer's premises where the purveyor relies upon approved backflow preventers to protect the public water system from contamination, the assessed hazard level of each, and the required backflow preventer(s);
  (ii) Inventory information on backflow preventers that protect the public water system including:
  (A) Approved air gaps installed in lieu of approved assemblies including exact

air gap location, assessed degree of hazard, installation date, history of inspections, inspection results, and person conducting inspections;
(B) Approved backflow assemblies including exact assembly location, assembly description (type, manufacturer, model, size, and serial number), assessed degree of hazard, installation date, history of inspections, tests and repairs, test results, and person performing tests; and
(C) Approved AVBs used for irrigation system applications including location, description (manufacturer, model, and size), installation date, history of inspection(s), and person performing inspection(s).
(iii) Cross-connection program summary reports and backflow incident reports required under subsection (8) of this section.
Subsection 8 – Recordkeeping and reporting

(a) Purveyors shall keep cross-connection records for the following time frames:
    (ii) Records pertaining to the master list of service connections and/or consumer's premises required in subsection (3)(j)(i) of the section shall be kept as long as the premises pose a cross-connection hazard to the purveyor's distribution system;
    (iii) Records regarding inventory information required in subsection (3)(j)(ii) of this section shall be kept for five years or for the life of the approved backflow preventer whichever is shorter: and
    (iv) Records regarding backflow incidents and annual summary reports required in subsection (3) (j) (iii) of this section shall be kept for five years.
(b) Purveyors may maintain cross-connection control records in original form or transfer data to tabular summaries.
(c) Purveyor may maintain records or data in any media, such as paper, film, or electronic format.
(d) The purveyor shall complete the cross-connection control program summary report annually. Report forms and guidance on completing the report are available from the department.
(e) The purveyor shall make all records and reports required in subsection (3) (j) of this section available to the department or its representative upon request.

The City's Cross-Connection Control Program currently uses XC2 electronic software to track level of hazard, location, installation date, inspection history, test and repair history, test results, and inspecting personnel on backflow prevention assemblies used for the protection of the City's public water supply.

Annual summary report:
WAC 246.290.490, part 8d – The purveyor shall complete the cross-connection control program summary report annually.

- *The annual summary report is reviewed and signed by the Water Operations Manager, and submitted to the Department of Health via mail, or secured web site.*
- *Copies of the annual summary report are available in the Cross-Connection Program Manual.*

Records & Reports:
Purveyors must develop and maintain records of their Cross-Connection Control program, as mandated by WAC 246.290.490. At a minimum, purveyors must maintain the following records:

- *Master list of service connections and/or premises where backflow prevention assemblies are installed to protection the public water system.*
- *Assessed hazard level of each backflow prevention assembly.*
- *Inventory information on approved air gaps, including location, degree of hazard, installation date, inspection history & results, and personnel conducting inspection.*
- *Backflow prevention assembly inventory information including location, assembly description, installation date & history, test & repair history, test results, and personnel conducting inspection.*
- *Program summary and backflow incident reports.*

- Element 10: Purveyors who distribute and/or have facilities that receive reclaimed water within their water service area shall meet any additional cross-connection control requirements imposed by the department in a permit issued under chapter 90.46 RCW.

  No reclaimed water within the purveyor's water system.

  General Program Requirements:

  WAC246-290-490(1) (c): The purpose of the purveyor's cross-connection program shall be to protect the public water system, as defined in WAC 246-290-010, from contamination via cross-connections.

  This is covered under Element 1 of the City's Cross Connection Control Program.

  WAC 246-290-490(1) (d): The purveyor's responsibility for cross-connection control shall begin at the water supply source, include all the public water treatment, storage, and distribution facilities, and end at the point of delivery to the consumer's water system, which begins at the downstream end of the service connection or water meter located on the public right-of-way or utility-held easement.

The City's Cross Connection Control Program is not responsible for Cross Connection Control inside the consumer's building and/or property. The Authority Having Jurisdiction (AHJ) is responsible for inside the consumer's building and/or property as per the Uniform Plumbing Code for Cross Connection Control 603.0

WAC 246-290-490(1) (e): Under this section, purveyors are not responsible for eliminating or controlling cross-connections within the consumer's water system. Under chapter 19.27 RCW, the responsibility for cross-connection control within the consumer's water system, i.e., within the property lines of the consumer's premises, lies with the authority having jurisdiction.

The City's Cross Connection Control Program is responsible for eliminating and/or controlling Cross Connections from the consumer's building and/or property via premises isolation. Service connections from the water main shall have a Reduced Pressure Backflow Assembly used for the protection of the public water supply. Examples of service connections include but are not limited to, domestic water, irrigation water and fire protection water.

WAC 246-290-490(2) (a) The purveyor shall develop and implement a cross-connection control program that meets the requirements of this section, but may establish a more stringent program through local ordinances, resolutions, codes, bylaws, or operating rules.

This is covered under Element 1 of the City's Cross Connection Control Program.

WAC 246-290-490(2) (b) Purveyors shall ensure the good engineering and public health protection practices are used in the development and implementation of cross-connection control programs. Department publications and the most recently published editions of references, such as, but not limited to, those listed below, may be used as guidance for cross-connection program development and implementation:

(i) Manual of Cross-Connection Control published by the Foundation for Cross-Connection Control and Hydraulic Research, University of Southern California (USC Manual); or

(ii) Cross-Connection Control Manual, Accepted Procedure and Practice published by the Pacific Northwest Section of the American Water Works Association (PNWS-AWWA Manual)

(iii) Guidance document: *Cross-Connection Control for Small Water Systems* published by the department.

The following reference guides and publications were used in the development of the City's Cross-Connection Control Program;

- *Washington Administrative Code WAC 246-290, Group A Public Water Systems, effective April 27, 2003*
- *Cross-Connection Control Manual Accepted Procedures ad Practice 6th Edition, December 1995*

- *Cross-Connection Control Manual Supplement 1st Edition, December 1995*
- *Cross-Connection Control for Small water Systems Guidance Document, September 2003*
- *Backflow Incident Investigation Procedures 1st Edition, December 1996*
- *Environmental Protection Agency Cross-Connection Control Manual, revised February 2003*
- *American Society of Sanitary Engineering, Performance Requirements for Outdoor Enclosures for Backflow Prevention Assemblies*
- *Backflow Prevention Assemblies Field Test Procedures Approved for use in Washington State, July 1998*
- *Uniform Plumbing Code 2000 Edition, September 1999*
- *Backflow Prevention Assemblies Approved for Installation in Washington State, published annually*
- *University of Southern California Manual of Cross-Connection Control 9th Edition, December 1993*
- *American Water Works Association Recommended Practice for Backflow Prevention and Cross-Connection Control M14 3rd Edition, 2004*
- *American water Works Association Distribution System Requirements for Fire Protection M31 3rd Edition, 1998*

WAC 246-290-490(2) (c) The purveyor may implement the cross-connection control program, or any portion thereof, directly or by means of a contract with another agency or party acceptable to the department.

The City's Water Division implements the Cross-Connection Control Program used for the protection of the public water supply.

WAC 246-290-490(2) (d) The purveyor shall coordinate with the authority having jurisdiction in all matters concerning cross-connection control. The purveyor shall document and describe the coordination, including delineation of responsibilities, in the written cross-connection control program required in (e) of this subsection.

- *The Authority Having Jurisdiction (AHJ) shall enforce the Uniform Plumbing Code and/or Uniform Plumbing Code Standards for Cross-Connection Control, or subsequent revisions:*

    1. *603.0 Cross-Connection Control*
    2. *603.1 Approval of Devices or Assemblies*
    3. *603.2 Backflow Prevention Devices, Assemblies, and Methods*
    4. *603.3 General Requirements*
    5. *603.4 Specific Requirements*

    Amended 2000 UPC, effective July 1, 2002

The control of Cross-Connections requires cooperation between the water purveyor, Authority Having Jurisdiction (AHJ), health officer and the consumer.

The City of Auburn Water Division shall make available to all Local Agencies the information maintained in the purveyors Cross-Connection Control program files, which may include, but is not limited to:

1. *A master list of all premises that have been isolated from the purveyor water system in accordance with the purveyors' cross-connection control program.*

2. *Information concerning any internal cross-connections that come to the attention of the purveyor during risk assessment evaluations of premises.*

3. *Notification of any termination of water service for failure to comply with the requirements of WAC 246-290-490, Auburn City Code 13.12, and/or the City of Auburn Water Department Cross-Connection Control Program and/or any subsequent revisions.*

UPC 603.3.3 For devices and assemblies other than those regulated by the Washington Department of health in conjunction with the local water purveyor for the protection of the public water systems, the Administrative Authority shall ensure that the owner or responsible person shall have the backflow prevention assembly tested by a Washington State Department of Health certified backflow assembly tester:

- *At the time of installation, repair, or relocation; and*
- *At least on an annual schedule thereafter, unless more frequent testing is required by the Administrative Authority.*

WAC 246-290-490(2) (e) The purveyor shall include a written description of the cross-connection control program in the water system plan required under WAC 246-290-100 or the small water system management program required under WAC246-290-105. The cross-connection control program shall include the minimum program elements described in subsection (3) Minimum elements of a cross-connection control program

The City's Water System plan in under revision

WAC 246-290-490(2) (f) The purveyor shall ensure that cross-connection between the distribution system and a consumer's water system are eliminated or controlled by the installation of an approved backflow preventer commensurate with the degree of hazard. This can be accomplished by implementation of a cross-connection program that relies on:

(i) Premises isolation as defined in WAC 246-290-010; or

(ii) Premises isolation and in-premises protection as defined in WAC 246-290-010

The City's Cross Connection Control Program relies on premises isolation to protect the public water system. All domestic water service with the exception of single family residential shall be required to install a Reduced Pressure Backflow Assembly (RPBA). Fire protection systems and landscape irrigation system shall be required to install a Reduced Pressure Backflow Assembly (RPBA). Backflow assembly type may be reduced to a lesser for irrigation and fire protection by submitting plans for the City's Cross Connection Specialist to review and conduct a hazard evaluation and risk assessment posed on the public water system. All changes shall be approved by the City's Cross Connection Specialist in writing.

WAC 246-290-490(2) (g) Purveyor with cross-connection control programs that rely both on premises isolation and in-premises protection:

(i) Shall comply with the premises isolation requirements specified in subsection (4) (b) of this section; and

(ii) May reduce premises isolation requirements and rely on in-premises protection for premises other than the type not addressed in subsection (4) (b) of this sections, if the conditions in (h) of this subsection are met:
(A) The in-premises backflow preventers provide a level of protection commensurate with the purveyor's assessed degree of hazard;
(B) Backflow preventers which provide the in-premises backflow protection meet the definition of approved backflow preventers as described in WAC 246-290-010;
(C) The approved backflow preventers are installed, inspected, tested (if applicable), maintained, and repaired in accordance with subsections (6) and (7) of this section;
(D) Records of the backflow preventers are maintained in accordance with subsections (3)(j) and (8) of this section; and
(E) The purveyor has reasonable access to the consumer's premises to conduct an initial hazard evaluation and periodic reevaluations to determine whether the in-premises protection is adequate to protect the purveyor's distribution system.

The City's Cross-Connection Control Program CAN NOT rely on in-premises protection to protect the distribution system for the following reasons:

- *Consumer can make plumbing changes at any time without notifying the city.*
- *Backflow preventers installed inside consumers buildings and/or premises are under the control of the Authority Having Jurisdiction (AHJ).*
- *Not enough staff to conduct initial inspections and re-inspections of consumer's premises.*

WAC 246-290-490(2) (h) The purveyor shall take appropriate corrective action as authorized by the legal instrument required by subsection (3)(b) of this section, when:
(i) A cross-connection exists that is not controlled commensurate to the degree of hazard assessed by the purveyor; or

(ii) A consumer fails to comply with the purveyor's requirements regarding the installation, inspection, testing, maintenance or repair of approved backflow preventers required by this chapter.

The City's Cross-Connection Control Program enforcement action includes, but is not limited to, a $250.00 fine each day and/or discontinuance (TURN OFF) of water service.

WAC 246-290-490(2) (i) The purveyor's corrective action may include, but is not limited to:
(i) Denying or discontinuing water service to a consumer's premises until the cross connection hazard is eliminated or controlled to the satisfaction of the purveyor;
(ii) Requiring the consumer to install an approved backflow preventer for premises isolation commensurate with the degree of hazard; or
(iii) The purveyor installing an approved backflow preventer for premises isolation commensurate with the degree of hazard.

The City's Cross-Connection Control Program enforcement action includes, but is not limited to, a $250.00 fine each day and/or discontinuance (TURN OFF) of water service.

WAC 246-290-490(2) (j) Except in the event of an emergency, purveyors shall notify the authority having jurisdiction prior to denying or discontinuing water service to a consumer's premises for one or more of the reasons listed in (h) of this subsection.

The City's Cross-Connection Control Program shall notify the Authority Having Jurisdiction (AHJ) prior to denying and/or discontinuing water service except in the event of an emergency and/or backflow incident.

WAC 246-290-490(2) (k) The purveyor shall prohibit the intentional return of used water to the purveyor's distribution system. Used water includes, but is not limited to, water used for heating,cooling, or other purposes within the consumer's water system.

The City's Cross Connection Control Program relies on premises isolation to protect the City's public water system. All domestic water service with the exception of single family residential shall be required to install a Reduced Pressure Backflow Assembly (RPBA). Fire protection systems and landscape irrigation system with chemical addition or injection shall be required to install a Reduced Pressure Backflow Assembly (RPBA). Backflow assembly type may be reduced to a lesser for irrigation and fire protection by submitting plans for the City's Cross Connection Specialist to review and conduct a hazard evaluation and risk assessment posed on the public water system. All changes shall be approved by the City's Cross Connection Specialist in writing.

WAC 246-290-490(3) (a) To be acceptable to the department, the purveyor's cross-connection control program shall include the minimum elements identified in the subsection.

The City's Cross Connection Control Program includes the Ten Elements as required by the WAC.

WAC 246-290-490(4) (a) The purveyor shall ensure that a Cross Connection Control Specialist:

(i) Assesses the degree of hazard posed by the consumer's water system upon the purveyor's distribution system; and

(ii) Determines the appropriate method of backflow protection for premises isolation in accordance with Table 8

Table 8
Appropriate Methods of Backflow Protection for Premises Isolation

Degree of Hazard	*Application Condition*	*Appropriate Approved Backflow Preventer*
High health cross-connection hazard	*Backsiphonage or backpressure backflow*	*AG, RPBA or RPDA*
Low health cross-connection hazard	*Backsiphonage or backpressure backflow*	*AG, RPBA, RPDA, DCVA or DCDA*

WAC246-290-490(4) (b) Premises isolation requirements.

(i) The purveyor shall ensure that an approved air gap, RPBA, or RPDA is installed for premises isolation for service connections to premises posing a high health cross-connection hazard including, but not limited to, those premises listed in Table 9, except those premises identified as severe in (b)(ii) of this subsection.

(ii) For service connections to premises posing a severe health cross-connection hazard including wastewater treatment plants, radioactive material processing plants, and nuclear reactors, the purveyor shall ensure that either an:

(A) Approved air gap is installed for premises isolation; or

(B) Approved RPBA or RPDA is installed for premises isolation in combination with an in-plant approved air gap.

(iii) If the purveyor's CCS determines that no hazard exists for a connection serving premises of the type listed in Table 9, the purveyor may grant an exception to the facility.

(iv) The purveyor shall document, on a case-by-case basis, the reasons for granting an exception under (b)(i) of this subsection and include the documentation in the cross-connection control program annual summary report required in subsection (8) of this section.

Table 9

High Health Cross-Connection Hazard Premises Requiring Premises Isolation by AG or RPBA/RPDA

- *Agricultural (farms and dairies)*
- *Beverage bottling plants*
- *Car washes*
- *Chemical plants*
- *Commercial laundries and dry cleaners*
- *Premises where both reclaimed water and potable water are provided*
- *Film processing facilities*
- *Food processing plants*
- *Hospitals, medical centers, nursing homes, veterinary, medical and dental clinics, and blood plasma centers;*
    1. *Hospitals (include psychiatric hospitals and alcohol and drug treatment centers)*
    2. *Same day surgery centers*
    3. *Out-patient clinics and offices*
    4. *Alternative health out-patient clinics and offices*
    5. *Psychiatric out-patient clinics and offices*
    6. *Chiropractors*
    7. *Hospice care centers*
    8. *Kidney dialysis centers*
    9. *Blood centers*
    10. *Dental clinics and offices*
    11. *Nursing homes*
    12. *Boarding homes*
    13. *Residential treatment centers*
    14. *Mortuaries*
    15. *Morgues and autopsy (not in hospitals)*
    16. *Veterinarian offices, clinics, and hospitals*
- *Premises with separate irrigation systems using the purveyor's water supply and with chemical addition*
- *Laboratories*
- *Metal plating industries*
- *Mortuaries*
- *Petroleum processing or storage plants*
- *Piers and docks*
- *Radioactive material processing plants or nuclear reactors**
- *Survey access denied or restricted*
- *Wastewater lift stations and pumping stations*
- *Wastewater treatment plants**
- *Premises with an unapproved auxiliary water supply interconnected with the potable water supply (private well, pond, tanks, etc.)*

WAC 246-290-490(4) (c) Backflow protection for single-family residences.

(i) For single-family residential service connections, the purveyor shall comply with the requirements of (b) of this subsection when applicable.

(ii) If the requirements of (b) of this subsection do not apply and the requirements specified in subsection (2)(g)(ii) of this section are met, the purveyor may rely on backflow protection provided at the point of hazard in accordance with WAC 51-56-0600 of the UPC for hazards such as, but not limited to:

(A) Irrigation systems;
(B) Swimming pools or spas;
(C) Ponds; and
(D) Boilers.

For example, the purveyor may accept an approved AVB on a residential irrigation system, if the AVB is properly installed under the UPC.

The City's Cross Connection Control Program is not responsible for Cross Connection Control inside the consumer's building and/or property. This falls under the Authority Having Jurisdiction (AHJ) as per the Uniform Plumbing Code for Cross Connection Control 603.0

WAC 246-290-490(4) (d) Backflow protection for fire protection systems.

(i) Backflow protection is not required for residential flow-through or combination fire protection systems constructed of potable water piping and materials.

(ii) For service connections with fire protection systems other than flow-through or combination systems, the purveyor shall ensure that backflow protection consistent with WAC 51-56-0600 of the UPC is installed. The UPC requires minimum protection as follows:

(A) An RPBA or RPDA for fire protection systems with chemical addition or using unapproved auxiliary water supply; and

(B) A DCVA or DCDA for all other fire protection systems.

(iii) For connections made on or after April 9, 1999, the purveyor shall ensure that backflow protection is installed before water service is provided.

(iv) For existing fire protection systems:

(A) With chemical addition or using unapproved auxiliary supplies, the purveyor shall ensure that backflow protection is installed within ninety days of the purveyor notifying the consumer of the high health crossconnection hazard or in accordance with an alternate schedule acceptable

(B) Without chemical addition, without on-site storage, and using only the purveyor's water (i.e., no unapproved auxiliary supplies on or available to the premises), the purveyor shall ensure that backflow protection is installed in accordance with a schedule acceptable to the purveyor or at an earlier date if required by the code official administering the State Building Code as defined in chapter 51-04 WAC.

(C) When establishing backflow protection retrofitting schedules for fire protection systems that have the characteristics listed in (d)(iv)(B) of this subsection, the purveyor may consider factors such as, but not limited to, impacts of assembly installation on sprinkler performance, costs of

retrofitting, and difficulty of assembly installation.

The City's Cross-Connection Control Program evaluation of new and existing fire protection system connections is as follows: New connections must comply with the City's Design Standards 7.01.4 Cross Connection Control, City's Construction Standards Water 21, 22, 23, 24, along with any additional requirements by the Fire Authority, Authority Having Jurisdiction (AHJ), and evaluated by the City's Cross-Connection Control Specialist during the permit and plan review process and before service is provided. Fire Sprinkler System service connection(s) to new consumers and/or premises shall have a risk assessment conducted by the City's Cross-Connection Control Specialist to determine if the backflow protection is commensurate with the degree of hazard, the backflow assembly is correctly installed and a valid test of the backflow assembly is conducted before the BFL permit is finaled.
Existing Fire Sprinkler System service connections are given a risk assessment by the City's Cross-Connection Specialist to determine if the backflow protection is commensurate with the degree of hazard. If the Fire Sprinkler System has the characteristics of WAC 246-290-490 (d) (iv) (a) – i.e. chemical addition or unapproved auxiliary supplies – the consumers and/or premises shall install backflow protection commensurate with the degree of hazard within (90) ninety days of the City notifying the consumes and/or premises or within an alternate schedule acceptable to the City's Cross-Connection Control Program. If the Fire Sprinkler System does not have chemical addition or unapproved auxiliary supplies, the consumer and/or premises shall install backflow protection commensurate with the degree of hazard within (90) ninety days of the City notifying the consumers and/or premises or within an alternate schedule acceptable to the City's Cross-Connection Control Program. Factors such as, but not limited to, impact of the backflow assembly installation on the fire sprinklers performance, costs of retrofitting, and difficulty of installation are consideration for an alternate schedule.

The cost/fees of installation, initial and annual testing, maintenance, and repair or replacement of the backflow assembly shall be the responsibility of the consumer as a condition of water service.

WAC 246-290-490(4) (e) Purveyors may require backflow preventers commensurate with the degree of hazard determines by the purveyor to be installed for premises isolation for connections serving premises that have characteristics such as, but not limited to, the following:

(i) Complex plumbing arrangements or plumbing potentially subject to frequent changes that make it impracticable to assess whether cross-connection hazards exist;
(ii) A repeated history of cross-connections being established or reestablished; or
(iii) Cross-connection hazard are unavoidable or not correctable, such as, but not limited to, tall buildings.

The City's Cross-Connection Control Program requires Reduced Pressure Backflow Assembly(RPBA) protection for consumer's building and/or property with the following defined characteristics:

- *Premises identified as Table 9 (high hazard) facility and/or non-single family facility –*
- *Complex plumbing arrangements –*
- *Plumbing subject to frequent changes –*
- *Repeat history of cross-connections –*
- *Unavoidable cross-connection hazards –*
- *Non-correctable cross-connection hazards –*

WAC 246-290-490(5) (a) The purveyor shall ensure that all backflow prevention assemblies relied upon by the purveyor are models included on the current list of backflow prevention assemblies approved for use in Washington state.

The City's Cross-Connection Control Program verifies new backflow assemblies installed within the distribution system are on the current DOH Approved Assemblies List.

WAC 246-290-490(5) (b) The purveyor may rely on testable backflow prevention assemblies that are not currently approved by the department, if the assemblies:

(i) Were included on the department and/or USC list of approved backflow prevention assemblies at the time of installation;
(ii) Have been properly maintained;
(iii) Are commensurate with the purveyor's assessed degree of hazard; and
(iv) Have been inspected and tested at least annually and have successfully passed the annual test

The City's Cross-Connection Control Program archives DOH Approved Assemblies List for verification.

WAC 246-290-490(5) (c) The purveyor shall ensure that an unlisted backflow prevention assembly is replaced by an approved assembly commensurate with the degree of hazard, when the unlisted assembly:

(i) Does not meet the conditions specified in (b) (i) through (iv) of this subsection;
(ii) Is moved; or
(iii) Cannot be repaired using spare parts from the original manufacturer.

This is covered under Element 5 of the City's Cross Connection Control Program.

WAC 246.290.490(6) (a) The purveyor shall ensure that approved backflow preventers are installed in the orientation for which they are approved (if applicable).

The City's Cross-Connection Control Program requires all approved backflow assemblies to be installed in the orientation for which they are approved. Installation requirements on backflow assemblies used for the protection of the

public water supply are available on the City's Construction Standards Water 21, 22, 23, 24.

WAC 246.290.490(6) (b) The purveyor shall ensure that approved backflow preventers are installed in a manner that:

(i) Facilitates their proper operation, maintenance, inspection, and/or in-line testing (as applicable) using standard installation procedures acceptable to the department such as those in the USC Manual or PNWS-AWWA Manual;

(ii) Ensures that the assembly will not become submerged due to weather-related conditions such as flooding; and

(iii) Ensures compliance with all applicable safety regulations.

The City's Cross-Connection Control Program requires all approved backflow assemblies used for the protection of the public water supply to be installed in the orientation for which they are approved and meets the City's Construction Standards Water 21, 22, 23, 24, USC Manual and PNWS-AWWA Manual. Backflow assemblies under the jurisdiction of the water purveyor shall not be installed in areas subject to flooding and shall meet all applicable safety regulations.

WAC 246.290.490(6) (c) The purveyor shall ensure that approved backflow assemblies for premises isolation are installed at a location adjacent to the meter or property line or an alternate location acceptable to the purveyor.

WAC 246.290.490(6) (d) When premises isolation assemblies are installed at an alternate location acceptable to the purveyor, the purveyor shall ensure that there are no connections between the point of delivery from the public water system and the approved backflow assembly, unless the installation of such a connection meets the purveyor's cross-connection control requirements and is specifically approved by the purveyor.

The City's Cross-Connection Control Program requires all approved Reduced Pressure Backflow Assemblies (RPBA) used for premises isolation be installed at a location adjacent to the meter or property line, however if the location is not feasible then the facilities property owner and/or representative shall submit a set of plans for approval by the City's Cross-Connection Control Specialist showing the new location of the Reduced Pressure Backflow Assembly (RPBA) and the piping from the meter. The Reduced Pressure Backflow Assembly (RPBA) shall be installed inside the building at the point of where the service line enters and with no branch connections between the water meter and backflow assembly

WAC 246.290.490(6) (e) The purveyor shall ensure that approved backflow preventers are installed in accordance with the following time frames:

(i) For connections made on or after April 9, 1999, the following conditions shall be met before service is provided:
(A) The provisions of subsection (3)(d)(ii) of this section; and
(B) Satisfactory completion of the requirements of subsection (7) of this section.

(ii) For existing connections where the purveyor identifies a high health cross connection hazard, the provisions of (3)(d)(ii) of this section shall be met:
(A) Within ninety days of the purveyor notifying the consumer of the high health cross-connection hazard; or
(B) In accordance with an alternate schedule acceptable to the purveyor.

(iii) For existing connections where the purveyor identifies a low cross-connection hazard, the provisions of subsection (3)(d)(ii) of this section shall be met in accordance with a schedule acceptable to the purveyor.

This is covered under Element 2 of the City's Cross Connection Control Program.

WAC 246.290.490(6) (f) The purveyor shall ensure that bypass piping installed around any approved backflow preventer is equipped with an approved backflow preventer that:

(i) Affords at least the same level of protection as the approved backflow preventer that is being bypassed; and

(ii) Complies with all applicable requirements of this section.

The City's Cross-Connection Control Program requires all bypass piping and/or parallel connections to have the same level of protection with a Reduced Pressure Backflow Assembly and/or Approved Air Gap if required by the City's Cross Connection Specialist.

WAC 246.290.490(8) (f) The purveyor shall notify the department, local administrative authority, and local health jurisdiction as soon as possible, but no later than the end of the next business day, when a backflow incident is known by the purveyor to have:

(i) Contaminated the public water system; or

(ii) Occurred within the premises of a consumer served by the purveyor.

This is covered under Element 7 of the City's Cross Connection Control Program.

WAC 246.290.490(8) (g) – The purveyor shall:

- Document details of backflow incidents on a form acceptable to the department such as the backflow incident report form included in the most recent edition of the PNWS-AWWA Manual: and
- Include all backflow incident report(s) in the annual cross0connection program summary report.

This is covered under Element 7 of the City's Cross Connection Control Program.

Definitions:

"Accessible" means reference to the installation of backflow preventers; accessible shall mean that such backflow preventers shall be placed so that they can be reached for testing and/or maintenance safely.

"Approval/approved" means authorized in writing by the health authority, department, purveyor, or other agency having jurisdiction.

"Approved air gap," means a physical separation between the free-flowing end of a potable water supply pipeline and the overflow rim of an open or non-pressurized receiving vessel.

To be an air gap approved by the department, the separation must be at least:

- Twice the diameter of the supply piping measured vertically from the overflow rim of the receiving vessel, and in no case be less than one inch, when unaffected by vertical surfaces (sidewalls); and:

- Three times the diameter of the supply piping, if the horizontal distance between the supply pipe and a vertical surface (sidewall) is less than or equal to three times the diameter of the supply pipe, or if the horizontal distance between the supply pipe and intersecting vertical surfaces (sidewalls) is less than or equal to four times the diameter of the supply pipe and in no case less than one and one-half inches.

"Approved atmospheric vacuum breaker" means an AVB of make, model, and size that is approved by the department. AVBs that appear on the current approved backflow prevention assemblies list developed by the University of Southern California Foundation for Cross-Connection Control and Hydraulic Research or that are listed or approved by other nationally recognized testing agencies (such as IAPMO, ANSI, or UL) acceptable to the local administrative authority are considered approved by the department.

"Approved backflow preventer" means an approved air gap, an approved backflow prevention assembly, or an approved AVB. The terms "approved backflow preventer," "approved air gap," or "approved backflow prevention assembly" refer only to those approved backflow preventers relied upon by the purveyor for the protection of the public water system. The requirements of WAC 246-290-490 do not apply to backflow preventers installed for other purposes.

"Approved backflow prevention assembly" means an RPBA, RPDA, DCVA, DCDA, PVBA, or SVBA of make, model, and size that is approved by the department. Assemblies that appear on the current approved backflow prevention assemblies list developed by the University of Southern California Foundation for Cross-Connection Control and Hydraulic Research or other entity acceptable to the department are considered approved by the department.

"As-built drawing" means the drawing created by an engineer from the collection of the original design plans, including changes made to the design or to the system that reflects the actual constructed condition of the water system.

"Assessment of risk" shall express the results of an evaluation (site survey) of a health, system, or plumbing hazard. The evaluation (site survey) required in making a determination of the type of backflow preventer needed to isolate a specific cross-

connection (e.g., a plumbing fixture), or a group of cross-connections contained within a facility or complex of facilities (e.g. a shopping mall) is comprised of the following steps:

- Determine the degree of potential health hazard risk to the public water system. (In assessing the purveyor's risk of contamination of the public water system, if knowledge of the degree of hazard posed by a substance is not known, the purveyor must assume that it is high. Generally, almost all substance other than potable water is considered a health hazard of some degree).
- Determine the high or low probability that a cross-connection may occur.
    1. The probability increases that an existing cross-connection will go undetected as the complexity of a piping system increases.
    2. Piping changes will create new cross-connections, or change the operating conditions from backsiphonage to backpressure conditions.
    3. A backflow preventer could be by-passed or removed from service.
    4. A substance could be changed or increased in strength.
    5. A substance may deteriorate, and thus become a health hazard.
    6. A substance, when combined with the chemicals in the potable water supply, or when exposed to certain piping material, may react and form a compound that poses a health hazard, such as CO2 mixing with water to from carbolic acid that leaches copper from a service pipe.
    7. A substance, if it contains a bacteriological contaminant, could become a health hazard long after it enters the potable water supply, though bacteria re-growth.
- Determine the risk level acceptable to the purveyor, and
- Determine the reliability required of the backflow preventer.

"Auxiliary water supply" means any water supply on, or available to, a premise in addition to the purveyor's approved public potable water supply.

"Auxiliary water supply – approved" means an auxiliary water supply which has been investigated and approved by the health authority, meets water quality regulations, and is accepted by the water purveyor.

"Auxiliary water supply – unapproved" means an auxiliary water supply, which is not approved by the health authority and the water purveyor.

"Backflow" means the undesirable reversal of flow of water or other substances through a cross-connection into the public water system or consumer's potable water system.

"Backflow assembly tester" means a person holding a valid BAT certificate issued in accordance with chapter 246-292 WAC.

"Backflow prevention assembly" means the nomenclature "assembly" refers to a backflow preventer which are designed to be in-line tested and repaired, and to meet the head loss and flow requirements of the recognized approval authority. The "assembly" consists of the backflow prevention unit, two resilient seated shutoff valves, and test cock(s).

"Backflow prevention device" means the nomenclature "device" refers to a backflow preventer that is not designed for in-line testing.

"Backpressure" means a pressure (caused by a pump, elevated tank or piping, boiler, or other means) on the consumer's side of the service connection that is greater than the pressure provided by the public water system and which may cause backflow.

"Backsiphonage" means backflow due to a negative or reduced pressure within the purveyor's potable water supply.

"Combination fire protection system" means a fire sprinkler system that:

- Is supplied only by the purveyor's water.
- Does not have a fire department pumper connection; and
- Is constructed of approved potable water piping and materials that serve both the fire sprinkler system and the consumer's potable water system.

"Consumer" means any person receiving water from a public water system from either the meter, or the point where the service line connects with the distribution system if no meter is present. For purposes of cross-connection control, "consumer" means the owner or operator of a water system connected to a public water system through a service connection.

"Consumer's water system" as used in WAC 246-290-490, means any potable and/or industrial water system that begins at the public water system point of delivery; that is, at the immediate downstream side of the water meter, and is located on the consumer's premises. The consumer's water system includes all auxiliary sources of supply, storage, treatment, and distribution facilities, piping, plumbing, and fixtures under the control of the consumer.

"Contaminant" means a substance present in drinking water that may adversely affect the health of the consumer or the aesthetic qualities of the water.

"Cross-connection" means any actual or potential physical connection between a public water system or the consumer's water system and any source of non-potable liquid, solid, or gas that could contaminate the potable water supply by backflow.

"Cross-connection control program" means the administrative and technical procedures the purveyor implements to protect the public water system from contamination via cross-connections as required in WAC 246-290-490.

"Cross-connection control specialist" means a person holding a valid Washington State Cross-Connection Control Specialist certificate issued in accordance with Chapter 246-292 WAC.

"Cross-connection control summary report" means the annual report required by the department that describes the status of the purveyor's cross-connection control program.

"Check valve" the term "check valve" is a generic term used for a variety of valves that specifically allow flow in one direction only. The variety of such valves includes slanting disc checks, silent check, (wafer or globe), automatic control checks, rubber flapper checks, double disc swing checks, swing checks (internally or externally weighted), and a spring-loaded check. A check valve in an approved assembly must be an approved check valve (components of double check valve assemblies, reduced pressure backflow assemblies, pressure vacuum breakers, and spill resistant vacuum breaker) that is drip-tight in the normal direction of flow when the inlet pressure is at least one p.s.i.

"Confined space," means any space having a limited means of egress and not intended for continuous occupancy, which is subject to the accumulation of toxic or flammable contaminants or an oxygen deficient atmosphere.

"Containment" means to restrict or limit the flow of contaminated or polluted water to the meter or service connection where the public water enters the private (consumer's) water system. The two systems are separated by a backflow preventer commensurate with the degree of hazard.

"Contamination" means an impairment of the quality of the potable water, which creates an actual hazard to the public health through poisoning or through the spread of diseases by sewage, industrial fluids or waste. Also defined as severe or high hazard. The term "contamination" used in EPA and drinking water regulations "maximum contamination level" bestows a different meaning than that used in describing a cross-connection hazard.

"Department" means the Washington State Department of Health or health officer as identified in a joint plan of operation in accordance with WAC 246-290-030 (1).

"Design and construction standards" means department design guidance and other peer reviewed documents generally accepted by the engineering profession as containing fundamental criteria for design and construction of water facility projects. Design and construction standards are comprised of performance and sizing criteria and reference general construction materials and methods.

"Direct service connection," means a service hookup to a property that is contiguous to a water distribution main and where additional mains or extensions are not needed to provide service.

"Distribution system" means all piping components of a public water system that serve to convey water from transmission mains linked to source, storage and treatment facilities to the consumer excluding individual services.

"Dual distribution system" means a facility with two water systems, one potable and the other non-potable. The purpose of the non-potable water system is to reduce the cost of the potable water supply.

"Double check detector assembly" (DCDA) means an approved assembly consisting of two approved double check valve assemblies, set in parallel, equipped with a meter on the bypass line to detect small amounts of water leakage or use.

"Double check valve assembly" (DCVA) means an approved assembly consisting of two independently operating check valves, loaded to the closed position by springs or weights, and installed as a unit with, and between, two resilient seated shutoff valves and having suitable connections for testing.

"Emergency" means an unforeseen event that causes damage or disrupts normal operations and requires immediate action to protect public health and safety.

"Fire Flow" means the maximum rate and duration of water flow needed to suppress a fire under WAC246.293.640 or as required under local fire protection authority standards.

"Fire Suppression Storage" means the volume of stored water available during fire suppression activities to satisfy minimum pressure requirements per WAC 246.290.230.

"First Consumer" means the first service connection associated with any source (i.e., the point where water is first withdrawn for human consumption, excluding connections where water is delivered to another water system covered by these regulations).

"Flow-through fire protection system" means a fire sprinkler system that:

- Is supplied only by the purveyor's water;
- Does not have a fire department pumper connection;
- Is constructed of approved potable water piping and materials to which sprinkler heads are attached; and
- Terminates at a connection to a toilet or other plumbing fixture to prevent the water from becoming stagnant.

"Guideline" means a department document assisting the purveyor in meeting a rule requirement.

"Health officer" means the health officer of the city, county, city-county health department or district, or an authorized representative.

"High health cross-connection hazard" means a cross-connection, which could impair the quality of potable water and create an actual public health hazard through poisoning or spread of disease by sewage, industrial liquids or waste.

"High health hazard" means a physical or toxic hazard, which could be detrimental to ones, health.

"Human Consumption" means the use of water for drinking, bathing or showering, hand washing, food preparation, cooking, or oral hygiene.

"Internally-loaded check valve" means a check valve which is internally loaded, either by springs or weights, to the extent it will be drip tight with a 1 p.s.i. differential in the direction of flow.

"Industrial piping system" refers to that piping system that transmits, confines, or stores any fluids that are not approved potable water. Such a system would include all pipes, tanks, fixtures, equipment and other extensions of the non-potable water system.

"In-premises protection" means a method of protecting the health of consumers served by the consumer's potable water system, located within the property lines of the consumer's premises by the installation of an approved air gap or backflow prevention assembly at the point of hazard, which is generally a plumbing fixture.

"Local administrative authority" means the local official, board, department, or agency authorized to administer and enforce the provisions of the Uniform Plumbing Code as adopted under chapter 19.27 RCW.

"Low health cross-connection hazard" means a cross-connection that could cause an impairment of the quality of potable water to a degree that dose not create a hazard to the public health, but does adversely and unreasonably affect the aesthetic qualities of such potable waters for domestic use.

"Non-potable fluid" means any water, other liquid, gas, or other substance, which is not safe for human consumption, or is not a part of the public potable water supply as described by the health authority.

"Non-potable piping system" means a piping system, which is made of non-potable material. Such materials are to be considered non-potable if they can affect either the aesthetics or degradation of the healthfulness of the water. Examples of such pipe are black iron and certain plastics.

"Plumbing hazard" is a cross-connection in a consumer's potable water system.

"Potable water" means water, which is safe for human consumption, free from harmful or objectionable materials, as described by the health authority/department.

"Premises isolation" means a method of protecting a public water system by installation of approved air gap or approved backflow prevention assemblies at or near the service connection or alternative location acceptable to the purveyor (at the point where the water purveyor no longer has legal jurisdiction and/or authority to control the water system) to isolate the consumer's water system from the purveyor's distribution system.

"Pressure vacuum breaker assembly" (PVBA) means an approved assembly consisting of a spring loaded check valve loaded to the closed position, an independently operating air inlet valve loaded to the open position and installed as a unit with and between two resilient seated shutoff valves and with suitable connections for testing. It is designed to protect against backsiphonage only.

"Private hydrant" means any hydrant, which is not owned, operated or maintained by the local water purveyor or his agent.

"Process water" means water that is directly connected to, or could come in contact with, an extreme high hazard situation, and must never be consumed by humans.

"Public health hazard" means a condition, device or practice which is conducive to the introduction of waterborne disease organisms, or harmful chemical, physical, or radioactive substance into a potable water system and which presents an unreasonable risk to health.

"Public water system" is defined and referenced under WAC 246-290-020.

"Purchased source," means water a purveyor purchases from a public water system not under the control of the purveyor for distribution to the purveyor's consumers.

"Purveyor" means an agency, subdivision of the state, municipal corporation, firm, company, mutual or cooperative association, institution, partnership, or person or other entity owning or operating a public water system. Purveyor also means the authorized agents of such entities.

"Reasonable risk" means the amount of risk acceptable to a prudent and reasonable water purveyor using reasonable diligence.

"Reclaimed water," means wastewater that has been treated for non-potable water use within the same facility or premise. Examples of use would be irrigation and industrial use.

"Reduced pressure backflow assembly" (RPBA) means an approved assembly consisting of two independently operating check valves, spring loaded to the closed position, separated by a spring loaded differential pressure relief valve loaded to the open position, and installed as a unit with and between two resilient seated shutoff valves and having four suitable test cocks for checking the water tightness of the check valves and the operation of the relief valve.

"Reduced pressure detector assembly" (RPDA) means an approved assembly consisting of two approved reduced pressure backflow assemblies, set in parallel, equipped with a meter on the bypass line to detect small amounts of water leakage or use. This unit must be purchased as a complete assembly. The assembly may be allowed on fire line water services in place of an approved reduced pressure backflow assembly upon approval by the local water purveyor.

"Regional public water supplier" means a water system that provides drinking water to one, or more, other public water systems.

"Resident" means an individual living in a dwelling unit served by a public water system.

"Safe drinking water act" was legislation that was enacted by the United States Congress in 1974 to ensure that the public is provided with safe drinking water, thereby protecting the public welfare.

"Safe drinking water" means water which has sufficiently low concentrations of microbiological, inorganic chemical, organic chemical, radiological or physical substance so that individuals drinking such water at normal levels of consumption will not be exposed to disease organisms or other substances which may produce harmful physiological effects.

"Service connection" means a connection to a public water system designed to provide potable water to a single-family residence, or other residential or non-residential population.

"Toxicity" means the degree to which a substance is toxic that is poisonous, in relating to affecting the potability of the water supply.

"Unapproved auxiliary water supply" means a water supply (other than the purveyor's water supply) on or available to the consumer's premises that is either not approved for human consumption by the health agency having jurisdiction or is not otherwise acceptable to the purveyor.

"Unreasonable risk to health" means a risk to health, which is not necessary or acceptable to the water purveyor and/or consumer; a term used to distinguish what type of backflow prevention should be required.

"Uniform Plumbing Code" means the code adopted under RCW 19.27.031(4) and amended under chapter 51-46 WAC. This code establishes statewide minimum plumbing standards applicable within the property lines of the consumer's premises.

"USC FCCCHR" is the abbreviation for the University of Southern California Foundation for Cross Connection Control and Hydraulic Research. It is an agency, which test and approves backflow prevention assemblies by approved standards.

"Used water," means water which has left the control of the purveyor. In most cases, the potable water has moved past (downstream of) the water meter and/or the property line.