## Cross-connection control rules and definitions

**Extracts from Group A Public Water Supplies, chapter 246-290 WAC**

The full rule is online at [http://www.doh.wa.gov/ehp/dw/publications/331-010.pdf](http://www.doh.wa.gov/ehp/dw/publications/331-010.pdf)

### WAC 246-290-010 Definitions.

"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 (AVB)" 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 authority having jurisdiction 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.

### Acronyms

<table>
<thead>
<tr>
<th>Acronym</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>AG</td>
<td>air gap</td>
</tr>
<tr>
<td>AVB</td>
<td>atmospheric vacuum breaker</td>
</tr>
<tr>
<td>AWWA</td>
<td>American Water Works Association</td>
</tr>
<tr>
<td>BAT</td>
<td>backflow assembly tester</td>
</tr>
<tr>
<td>CCS</td>
<td>cross-connection control specialist</td>
</tr>
<tr>
<td>DCDA</td>
<td>double check detector assembly</td>
</tr>
<tr>
<td>DCVA</td>
<td>double check valve assembly</td>
</tr>
<tr>
<td>EPA</td>
<td>U.S. Environmental Protection Agency</td>
</tr>
<tr>
<td>IAPMO</td>
<td>International Association of Plumbing and Mechanical Officials</td>
</tr>
<tr>
<td>PVBA</td>
<td>pressure vacuum breaker assembly</td>
</tr>
<tr>
<td>RPBA</td>
<td>reduced pressure backflow assembly</td>
</tr>
<tr>
<td>RPDA</td>
<td>reduced pressure detector assembly</td>
</tr>
<tr>
<td>SVBA</td>
<td>spill resistant vacuum breaker assembly</td>
</tr>
<tr>
<td>UPC</td>
<td>Uniform Plumbing Code</td>
</tr>
<tr>
<td>WAC</td>
<td>Washington Administrative Code</td>
</tr>
</tbody>
</table>
"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.

"Authority having jurisdiction" (formerly known as 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.

"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 under chapter 246-292 WAC.

"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 reduction in system pressure in the purveyor's distribution system and/or consumer's water system.

"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 or industrial water system that begins at the point of delivery from the public water system 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.

"Council" means the Washington state building code council under WAC 51-04-015(2).

"Cross-connection" means any actual or potential physical connection between a public water system or the consumer's water system and any source of nonpotable 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 CCS certificate issued under chapter 246-292 WAC.

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

"Department" means the Washington state department of health or health officer as identified in a joint plan of operation under WAC 246-290-030(1).

"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.

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

"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 stagnant water.

"High health cross-connection hazard" means a cross-connection involving any substance that could impair the quality of potable water and create an actual public health hazard through injury, poisoning, or spread of disease.

"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.

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

"Potable" means water suitable for drinking by the public.

"Premises isolation" means a method of protecting a public water system by installation of approved air gaps or approved backflow prevention assemblies at or near the service connection or alternative location acceptable to the purveyor to isolate the consumer's water system from the purveyor's distribution system.

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

"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 these entities.
"Reclaimed water" means effluent derived in any part from sewage from a wastewater treatment system that has been adequately and reliably treated, so that as a result of that treatment, it is suitable for beneficial use or a controlled use that would not otherwise occur, and it is no longer considered wastewater.

"Severe health cross-connection hazard" means a cross-connection which could impair the quality of potable water and create an immediate, severe public health hazard through poisoning or spread of disease by contaminants from radioactive material processing plants, nuclear reactors, or wastewater treatment plants.

"State building code" means the codes adopted by and referenced in chapter 19.27 RCW; the state energy code; and any other codes so designated by the Washington state legislature as adopted and amended by the council.

"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.

"Uniform Plumbing Code (UPC)" means the code adopted under RCW 19.27.031(4) and implemented under chapter 51-56 WAC. This code establishes statewide minimum plumbing standards applicable within the property lines of the consumer's premises.

"Used water" means water which has left the control of the purveyor.

WAC 246-290-490 Cross-connection control.

(1) Applicability, purpose, and responsibility.

(a) All community water systems shall comply with the cross-connection control requirements specified in this section.

(b) All non-community water systems shall apply the principles and provisions of this section, including subsection (4)(b) of this section, as applicable to protect the public water system from contamination via cross-connections. Noncommunity systems that comply with subsection (4)(b) of this section and the provisions of WAC 51-56-0600 of the UPC (which addresses the installation of backflow preventers at points of water use within the potable water system) shall be considered in compliance with the requirements of this section.

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

(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.

(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.
(2) General program requirements.

(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.

(b) Purveyors shall ensure that 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);

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


(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.

(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.

(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 WAC 246-290-105. The cross-connection control program shall include the minimum program elements described in subsection (3) of this section.

(f) The purveyor shall ensure that cross-connections 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.

(g) Purveyors 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 addressed in subsection (4)(b) of this section, only if the following conditions 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.

(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.

(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.

(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.

(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.

(3) Minimum elements of a cross-connection control program.

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

(b) 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.

(c) 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.

(d) **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.

(e) **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.

(f) **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.

(g) **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.

(h) **Element 7:** The purveyor shall develop and implement (when appropriate) procedures for responding to backflow incidents.

(i) **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.

(j) **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
(iii) Cross-connection program summary reports and backflow incident reports required under subsection (8) of this section.

(k) **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.

(4) **Approved backflow preventer selection.**

(a) The purveyor shall ensure that a CCS:

(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 as described in Table 8.

<table>
<thead>
<tr>
<th>Degree of Hazard</th>
<th>Application Condition</th>
<th>Appropriate Approved Backflow Preventer</th>
</tr>
</thead>
<tbody>
<tr>
<td>High health cross-connection hazard</td>
<td>Backsiphonage or backpressure backflow</td>
<td>AG, RPBA, or RPDA</td>
</tr>
<tr>
<td>Low cross-connection hazard</td>
<td>Backsiphonage or backpressure backflow</td>
<td>AG, RPBA, RPDA, DCVA, or DCDA</td>
</tr>
</tbody>
</table>

(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 premises isolation requirements of (b)(i) of this subsection.

(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

**SEVERE* AND HIGH HEALTH CROSS-CONNECTION HAZARD PREMISES REQUIRING PREMISES ISOLATION BY AG OR RPBA**

<table>
<thead>
<tr>
<th>Agricultural (farms and dairies)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Beverage bottling plants</td>
</tr>
<tr>
<td>Car washes</td>
</tr>
<tr>
<td>Chemical plants</td>
</tr>
<tr>
<td>Commercial laundries and dry cleaners</td>
</tr>
<tr>
<td>Premises where both reclaimed water and potable water are provided</td>
</tr>
<tr>
<td>Film processing facilities</td>
</tr>
<tr>
<td>Food processing plants</td>
</tr>
<tr>
<td>Hospitals, medical centers, nursing homes, veterinary, medical and dental clinics, and blood plasma centers</td>
</tr>
<tr>
<td>Premises with separate irrigation systems using the purveyor's water supply and with chemical addition+</td>
</tr>
<tr>
<td>Laboratories</td>
</tr>
<tr>
<td>Metal plating industries</td>
</tr>
<tr>
<td>Mortuaries</td>
</tr>
<tr>
<td>Petroleum processing or storage plants</td>
</tr>
<tr>
<td>Piers and docks</td>
</tr>
<tr>
<td>Radioactive material processing plants or nuclear reactors*</td>
</tr>
<tr>
<td>Survey access denied or restricted</td>
</tr>
<tr>
<td>Wastewater lift stations and pumping stations</td>
</tr>
<tr>
<td>Wastewater treatment plants*</td>
</tr>
<tr>
<td>Premises with an unapproved auxiliary water supply interconnected with the potable water supply</td>
</tr>
</tbody>
</table>

---

* For example, parks, playgrounds, golf courses, cemeteries, estates, etc.

+ RPBA for connections serving these premises are acceptable only when used in combination with an in-plant approved air gap; otherwise, the purveyor shall require an approved air gap at the service connection.
For single-family residential service connections, the purveyor shall comply with the premises isolation requirements of (b) of this subsection when applicable.

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.

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 cross-connection hazard or in accordance with an alternate schedule acceptable to the purveyor.

(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.
(e) Purveyors may require approved backflow preventers commensurate with the degree of hazard as determined 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 hazards are unavoidable or not correctable, such as, but not limited to, tall buildings.

(5) Approved backflow preventers.

(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 current approved assemblies list is available from the department upon request.

(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 tests.

(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.

(d) The purveyor shall ensure that AVBs meet the definition of approved atmospheric vacuum breakers as described in WAC 246-290-010.

(6) Approved backflow preventer installation.

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

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

(i) Facilitates their proper operation, maintenance, inspection, in-line testing (as applicable), and repair 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.
(b) 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.

(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 the connection meets the purveyor's cross-connection control requirements and is specifically approved by the purveyor.

(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.

(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.

(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.
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.

(8) Recordkeeping and reporting.

(a) Purveyors shall keep cross-connection control records for the following time frames:

(i) Records pertaining to the master list of service connections and/or consumer's premises required in subsection (3)(j)(i) of this section shall be kept as long as the premises pose a cross-connection hazard to the purveyor's distribution system;

(ii) 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

(iii) 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) Purveyors 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.

(f) The purveyor shall notify the department, authority having jurisdiction, 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.

(g) The purveyor shall:

(i) Document details of backflow incidents contaminating the public water system on a backflow incident report form available from the department; and

(ii) Include all backflow incident report(s) in the annual cross-connection program summary report referenced in (d) of this subsection, unless otherwise requested by the department.

For more information
Our publications are online at https://fortress.wa.gov/doh/eh/dw/publications/publications.cfm

Call the Office of Drinking Water Cross-Connection Control Program staff at (360) 236-3133 or toll-free (800) 521-0323.

If you need this publication in alternate format, call (800) 525-0127. For TTY/TDD, call (800) 833-6388.
ORDINANCE NO. 6774

Below is an extract of the Water OMC 13.04, from Ordinance No. 6774, which was approved and passed by the Olympia City Council on October 4, 2011 and published on October 8, 2011.

13.04.110 - Cross-connections and backflow protection

A. The provisions of WAC 246-290-490, as now or hereafter amended, relating to cross-connection control and elimination and the use of backflow prevention assemblies when such are considered to be advisable or required, are hereby adopted and made a part of this chapter. All provisions of the Washington Administrative Code may be executed and applied by the Public Works Department in determining when cross-connections are prohibited and when backflow prevention assemblies shall be required and tested under the City’s cross-connection control program. A copy of such provisions is on file in the City Clerk’s Office or with the Public Works Department.

B. The installation or maintenance of any uncontrolled cross connection, which could endanger the water quality of the City’s public water system, is prohibited. Any such cross connection now existing or hereafter installed is declared unlawful and shall be abated immediately. Abatement includes, but is not limited to, the discontinuance of water service or the installation of an approved backflow prevention assembly, equal to the degree of hazard, as determined by the City. Backflow prevention assembly installation and testing is the responsibility of the customer and the customer shall bear all costs to perform such activities.

C. Service shall be discontinued to any premises, water user or property owner for failure to comply with the rules and regulations contained in this section or failure to permit entry upon the premises by authorized City personnel for purposes of inspection and/or testing. Any service discontinued for such failure will not be reestablished until the Director of Public Works or his/her designee has approved compliance with the rules and regulations contained in this section.

D. The customer is responsible for backflow assembly testing upon initial installation and annually thereafter. The customer is required to provide proof of installation and proof of a passing test to the Director of Public Works or his/her designee by the annual due date.

E. The Director of Public Works or his/her designee will assign a test due date for each backflow prevention assembly. The due date for annual testing shall be based on the installation date of the assembly.
**13.04.440 – Failure to Comply – Violations – Penalties**

A. Discontinuance of Water Service. Service to any property, landowner, or water user receiving its water supply from the city water supply system is contingent upon compliance with all legal requirements pertaining to such water service. Service may be discontinued to any premises, water user, or property owner for failure to comply with such requirements and discontinued service will not be re-established until the Director of Public Works or his/her designee is satisfied that there has been compliance.

B. Any person, firm, or corporation who knowingly violates or fails to comply with any term or provision of this chapter shall be deemed to have committed a misdemeanor, and if found guilty, shall be subject to a fine not to exceed One Thousand Dollars ($1,000), and/or to imprisonment not to exceed ninety (90) days or to both such fine and imprisonment. Each day shall be a separate offense. In the event of a continuing violation or failure to comply, the second and subsequent days shall constitute a gross misdemeanor punishable by a fine not to exceed Five Thousand Dollars ($5,000) and/or imprisonment not to exceed three hundred and sixty-five (365) days or both such time and imprisonment. Continuing violation shall mean the same type of violation which is committed within a year of the initial violation.

C. As an additional concurrent penalty, it shall be a civil infraction for a person, firm, or corporation to violate or fail to comply with any term or provision of this chapter. Each day shall be a separate infraction. A person, firm, or corporation found to have committed a civil infraction shall be assessed a monetary penalty as follows:

1. First offense: Class 3 ($50), not including statutory assessments.

2. Second offense arising out of the same facts as the first offense: Class 2 ($125), not including statutory assessments.

3. Third offense arising out of the same facts as the first offense: Class 1 ($250), not including statutory assessments.

See also OMC Chapter 4.44, Uniform Civil Enforcement.

D. In the event a water user or property owner refuses to allow authorized City personnel to enter onto private property to accomplish the purposes stated in this chapter, the Director of Public Works or his/her designee is empowered to seek assistance from any court of competent jurisdiction to obtain a court order permitting entry. If such court order is required to obtain access, the water user or property owner who refused to allow the City entry is responsible for all costs of the City that are reasonably attributable to obtaining a court order.
City of Olympia  
Water Resources  
Procedure for Issuing Civil Infractions for Cross Connections

Section 1  
Purpose  
This procedure provides direction for the City of Olympia’s Cross Connection Control (CCC) Program by:  
1. Identifying the authority under Olympia Municipal Code (OMC) Chapter 13.04.440 to issue civil infractions to individuals failing to eliminate or isolate cross connections.  
2. Identify the coordination needed with City Code Enforcement Officers to initiate civil infractions.  
3. Outlining the process for implementing this procedure.

Section 2  
Background  
The City’s Cross Connection Control Program focuses on requiring all new water system connections serving commercial buildings or properties with a severe or high health cross connection hazard premises, commonly called a Table 9 hazard under state regulations, to meet backflow prevention requirements before water service is provided.

Not all of the existing water connections serving commercial buildings with a potential for a severe or high health hazard are protected due to the program being run as a combination program rather than a premises isolation program which is now required for all commercial properties. Current notification to these customers includes up to three letters before termination of water service occurs.

The City of Olympia’s Code Enforcement Division in Community Planning & Development’s Community Services Line of Business primarily focuses on Title 8 Nuisances, Title 16 Building and Construction (property maintenance, electrical and general building safety) and Title 18 Unified Development Code (zoning, signs and critical areas) because of limited resources.

Section 3  
Authority  
Department of Health (DOH) regulations, WAC 246-290-490(3)(b)(i)-(iii), requires the adoption of a local ordinance, resolution, code, bylaw, or other written legal instrument establishing the purveyor’s legal authority to implement a cross connection control program. The City’s CCC

The issuance of a civil infraction under OMC 13.04.440 pertains only to prohibiting cross connections as identified in OMC 13.04.110. Initiating a civil infraction will be done through one of the City's Code Enforcement Officers.

The enforcement actions which can be taken under the EDDS are shutting off water when the backflow prevention device is not promptly repaired or replaced. This generally occurs during the annual testing of the device (Section 6.115). Termination of service can also occur when a customer fails to prevent cross connections (Section 6.117). If the customer fails to install an appropriate backflow prevention device, the City may, at the expense of the owner, install the appropriate backflow prevention device.

**Section 4**

**Initiating a Civil Infraction**

The third and final letter sent by Cross Connection Control staff must contain a date by which the backflow prevention device must be installed. Once the final date has passed, and the customer has not complied, call or email the appropriate City Code Enforcement staff. Inform Code Enforcement they will be receiving a copy of the third letter and the program is requesting they issue a notice of violation. Issuance of a notice of violation begins the civil infraction process. A Notice of Violation will be sent to the owner via certified United States Postal Service and also posted in a conspicuous place on the front of the property by the Code Enforcement Officer. The notice will contain a comply-by date and will outline the penalties for non-compliance. The penalties associated with a civil infraction, including statutory assessments are: first offense penalty is $103, second offense is $257 and the third offense is $513. Each day may be considered a separate infraction on a case-by-case basis.

**Section 5**

**Contact Information**

- Cross Connection Control 753-8161.
- Code Enforcement Staff:
  - Chris Grabowski – 753-8168 – Eastside area
  - Georgia Sabol – 753-8393 – Westside area
## Appendix D – City of Olympia Backflow Prevention Assembly Test Report Form

**CITY OF OLYMPIA BACKFLOW PREVENTION ASSEMBLY TEST REPORT FORM**

Name of Business or Property Owner: ________________________________________
Address: ___________________________________________________________________
Device Location: _____________________________________________________________
Cross Connection Hazard: _____________________________________________________

### DEVICE TYPE AND SIZE

<table>
<thead>
<tr>
<th>Size</th>
<th>Manufacturer</th>
<th>Serial Number</th>
<th>Model Number</th>
</tr>
</thead>
</table>

Does the assembly meet the City of Olympia’s installation requirements?  Yes [ ] No [ ]

Comments:

### REDUCED PRESSURE PRINCIPLE ASSEMBLY

**Double Check Valve Assembly**

<table>
<thead>
<tr>
<th>Initial Test</th>
<th>Check Valve #1</th>
<th>Check Valve #2</th>
<th>Relief Valve</th>
<th>PVB/SVB</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Held at _____ PSID</td>
<td>Held at _____ PSID</td>
<td>Did not open [ ]</td>
<td>Air inlet</td>
</tr>
<tr>
<td></td>
<td>Leaked [ ]</td>
<td>Leaked [ ]</td>
<td>Opened at ____ PSID</td>
<td>Did not open [ ]</td>
</tr>
<tr>
<td>Repairs</td>
<td>Cleaned [ ]</td>
<td>Cleaned [ ]</td>
<td>Cleaned [ ]</td>
<td>Check Valve</td>
</tr>
<tr>
<td>Comments:</td>
<td>Replaced [ ]</td>
<td>Replaced [ ]</td>
<td>Replaced [ ]</td>
<td>Leaked [ ]</td>
</tr>
</tbody>
</table>

**Final Test**

<table>
<thead>
<tr>
<th></th>
<th>Held at _____ PSID</th>
<th>Held at _____ PSID</th>
<th>Held at _____ PSID</th>
<th>Air inlet</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Leaked [ ]</td>
<td>Leaked [ ]</td>
<td>Did not open [ ]</td>
<td>Opened at ____ PSID</td>
</tr>
</tbody>
</table>

### TEST EQUIPMENT

<table>
<thead>
<tr>
<th>Gauge</th>
<th>Make</th>
<th>Model</th>
<th>Serial Number</th>
<th>Verification Date</th>
</tr>
</thead>
</table>

### OTHER

Line pressure: _____________________________________________________________
Meter reading: ____________________________________________________________
Relief valve exercised: ___________________________________________________

Did the assembly pass the test using Washington State approved test procedures?  Yes [ ] No [ ]

<table>
<thead>
<tr>
<th>Initial Test</th>
<th>Repairs</th>
<th>Final Test</th>
</tr>
</thead>
<tbody>
<tr>
<td>Date</td>
<td>Print Name</td>
<td>Signature</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
# Appendix E - DOH Backflow Incident Report Form

## Cross-Connection Control Program

### BACKFLOW INCIDENT REPORT FORM

**Note:** use this form to comply with WAC 246-290-490(8)(g).

## Part 1: Public Water System (PWS) Information

<table>
<thead>
<tr>
<th>PWS ID:</th>
<th>PWS Name:</th>
<th>County:</th>
</tr>
</thead>
</table>

## Part 2: Backflow Incident Information

### A. Incident Identification

<table>
<thead>
<tr>
<th>Incident date:</th>
<th>Time of incident:</th>
<th>Incident ID (DOH use):</th>
</tr>
</thead>
</table>

### B. Information on Premises where Backflow Originated

<table>
<thead>
<tr>
<th>Name of premises:</th>
<th>Premises physical address:</th>
<th>City:</th>
<th>,WA</th>
<th>Zip:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Premises type:</td>
<td>non-residential ☐</td>
<td>residential ☐</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Premises category/description (Table 9 category*, if applicable):</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Most recent hazard evaluation prior to incident (mm/dd/yyyy):</th>
<th>None ☐</th>
</tr>
</thead>
<tbody>
<tr>
<td>PWS’s assessed hazard level:</td>
<td>Premises isolation required by PWS?</td>
</tr>
<tr>
<td>Type of backflow preventer required by PWS:</td>
<td>PWS relies on in-premises protection?</td>
</tr>
<tr>
<td>Other hazard evaluation information:</td>
<td></td>
</tr>
</tbody>
</table>

*See WAC 246-290-490(4)(b)(i).*

### C. Method of Discovery of Backflow

<table>
<thead>
<tr>
<th>How the backflow was discovered (check all that apply):</th>
<th>Direct observation ..................</th>
<th>☐</th>
<th>Water quality complaint ..................</th>
<th>☐</th>
</tr>
</thead>
<tbody>
<tr>
<td>Meter running backwards ..................................</td>
<td>☐</td>
<td>Illness/injury complaint ..................</td>
<td>☐</td>
<td></td>
</tr>
<tr>
<td>Water use decrease ......................................</td>
<td>☐</td>
<td>Result of Investigation ...................</td>
<td>☐</td>
<td></td>
</tr>
<tr>
<td>Disinfectant residual monitoring ...</td>
<td>☐</td>
<td>Other (Describe):</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Water quality monitoring .................</td>
<td>☐</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Incident reported to the public water system by:</th>
<th>PWS Personnel ☐</th>
<th>Premises Owner/Occupant ☐</th>
<th>Other PWS Customer ☐</th>
</tr>
</thead>
<tbody>
<tr>
<td>Backflow Assembly Tester ☐</td>
<td>Other (Specify):</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### D. Contaminant Information

<table>
<thead>
<tr>
<th>Contaminant type (check all that apply):</th>
<th>Microbiological ☐</th>
<th>Chemical ☐</th>
<th>Physical ☐</th>
</tr>
</thead>
<tbody>
<tr>
<td>Describe contaminant (for example, the organism name, chemical, etc.). Please attach lab analysis or MSDS, if available.</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
**E. Extent and Effects of Contamination**

<table>
<thead>
<tr>
<th>Estimated extent of contamination:</th>
<th>Contained within premises</th>
<th>Entered PWS distribution system</th>
</tr>
</thead>
<tbody>
<tr>
<td>Estimated number of connections affected:</td>
<td>Residential</td>
<td>Non-residential</td>
</tr>
<tr>
<td>Estimated population affected or at risk:</td>
<td>Residential</td>
<td>Non-residential</td>
</tr>
<tr>
<td>Number water quality complaints:</td>
<td>Describe water quality complaints:</td>
<td></td>
</tr>
<tr>
<td>Number illnesses reported:</td>
<td>Describe illnesses/irritation (specific illnesses, if known):</td>
<td></td>
</tr>
<tr>
<td>Number physical injuries (e.g. burns) or irritation (e.g. rashes) cases reported:</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Part 3: Cross-Connection Control Information at Backflow Site**

**A. Source of Contaminant**

<table>
<thead>
<tr>
<th>Source of contaminant or fixture type (check all that apply):</th>
<th>Air conditioner/heat exchanger</th>
<th>Auxiliary water supply</th>
<th>Beverage machine</th>
<th>Boiler, hot water system</th>
<th>Chemical injector/aspirator</th>
<th>Fire protection system</th>
<th>Irrigation system (PWS supplied)</th>
<th>Industrial/commercial process water/liquid</th>
<th>Medical/dental fixture</th>
<th>Reclaimed water system</th>
<th>Swimming pools, spa</th>
<th>Wastewater (sewage) system</th>
<th>Other (specify)</th>
</tr>
</thead>
</table>

**B. Distribution System Pressure Conditions in the Vicinity of the Backflow Incident**

<table>
<thead>
<tr>
<th>Type of backflow: Backsiphonage</th>
<th>Typical distribution system pressure in vicinity of incident (if range, enter lower end of range): psi</th>
</tr>
</thead>
<tbody>
<tr>
<td>Main/pressure status at time of incident (check all that apply): Backpressure</td>
<td>Normal</td>
</tr>
<tr>
<td>Main break</td>
<td>Fire fighting</td>
</tr>
<tr>
<td>Other high usage</td>
<td>Power outage</td>
</tr>
</tbody>
</table>

Describe causes and circumstances leading to backflow:

- In all other cases, complete tables in C and D for the in-premises backflow preventer installed at the fixture. If more than one backflow preventer was involved in the backflow incident, copy tables C and D and complete them for the additional preventer(s).
If no backflow preventer was installed at the time the incident occurred, check this box and go directly to Part 4. Don’t fill out the tables below (in C and D).

<table>
<thead>
<tr>
<th>Backflow preventer information:</th>
<th>Type installed:</th>
<th>Installed for:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Installation status (check all that apply):</td>
<td>Properly installed/plumbed</td>
<td>Improperly protected bypass present</td>
</tr>
<tr>
<td>Commensurate with assessed degree of hazard?</td>
<td>Yes</td>
<td>No</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>D. Backflow Preventer Inspection/Testing Information at Site of Backflow</th>
</tr>
</thead>
<tbody>
<tr>
<td>Most recent inspection/test information prior to backflow incident. Attach test report(s), if available.</td>
</tr>
<tr>
<td>Inspection/test information after backflow incident [per WAC 246-290-490(7)(b)]. Attach test report.</td>
</tr>
<tr>
<td>Preventer failure information, if applicable (check all that apply):</td>
</tr>
<tr>
<td>If preventer failed inspection/test, did failure allow backflow?</td>
</tr>
</tbody>
</table>

Part 4: Corrective Action/Notifications

<table>
<thead>
<tr>
<th>Action taken by PWS to restore water quality (check all that apply):</th>
<th>None</th>
<th>Other treatment (describe):</th>
</tr>
</thead>
<tbody>
<tr>
<td>Action ordered by PWS to correct cross-connection (check all that apply):</td>
<td>None</td>
<td>Change existing preventer</td>
</tr>
<tr>
<td>Action ordered accomplished?</td>
<td>Yes</td>
<td>Date:</td>
</tr>
<tr>
<td>Agency notifications per WAC 246-290-490(8)(f) (check all that apply):</td>
<td>DOH</td>
<td>Local Health Agency</td>
</tr>
<tr>
<td>Notifications of consumers in area of incident (check all that apply):</td>
<td>Population at risk</td>
<td>Public notification (PN per DOH regs.)</td>
</tr>
<tr>
<td>Other enforcement/corrective actions (describe):</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Part 5: Cost of Backflow Incident (optional)

<table>
<thead>
<tr>
<th>Item</th>
<th>PWS Personnel Hours Expended</th>
<th>Cost to PWS ($)</th>
<th>Cost to Premises Owner ($)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Investigation</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Restoration of water quality</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Correction of cross-connection situation</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Litigation and/or settlement</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Other not included in above</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Part 6: Further Information/Documentation

Additional information about this incident such as pictures, sketches, newspaper/journal articles, water quality analyses, epidemiological reports, etc. would be helpful. Information may be in electronic form or hard copy.

Part 7: Form Completion Information

Note: Form should be completed by a person currently certified as a Cross-Connection Control Specialist.

I certify that the information provided in this Backflow Incident Report is complete and accurate to the best of my knowledge.

<table>
<thead>
<tr>
<th>CCC Program Mgr. Name (print):</th>
<th>Title:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Signature:</td>
<td>CCS Cert. Number:</td>
</tr>
<tr>
<td>Date:</td>
<td>Date:</td>
</tr>
<tr>
<td>Phone:</td>
<td>E-mail:</td>
</tr>
</tbody>
</table>

I have reviewed this report and certify that the information is complete and accurate to the best of my knowledge.

<table>
<thead>
<tr>
<th>PWS Mgr./Representative Name (Print):</th>
<th>Title:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Signature:</td>
<td>Op. Cert. Number:</td>
</tr>
<tr>
<td>Date:</td>
<td>Date:</td>
</tr>
</tbody>
</table>

Please send completed backflow incident form:

By mail to:

Washington State Department of Health
Office of Drinking Water – CCC Program Manager
P O Box 47822
Olympia, WA 98504-7822

By email to: terri.notestine@doh.wa.gov or cccprogram@doh.wa.gov

Please send questions, comments, or suggestions about this form to us at the address above or e-mail them to cccprogram@doh.wa.gov

If you need this publication in an alternate format, call (800) 525-0127. For TTY/TDD, call (800) 833-6388.
SOP #20 Cross Connection Control Level of Protection

Note: Only City of Olympia Certified Cross Connection Control (CCS) personnel are authorized to determine the level of hazard protection.

References:
- City Of Olympia Engineering Design and Development Standards, most recent revisions
- Washington Administrative Code 246-290-490
- 2006 (or most current) Uniform Plumbing Code
- Washington State List of Approved Backflow Assemblies, DOH publication 331-137
- The most current USC (University of Southern California) List of Approved Backflow Assemblies

A. Determine the degree of hazard.
   1. Severe Health Hazard: A cross connection which could impair the quality of potable water and create an immediate, severe public health hazard through poisoning or spread of disease by contaminants from radioactive material, processing plants, nuclear reactors, or wastewater treatment plants.

   2. High Health Hazard: A cross connection involving any substance that could impair the quality of potable water and create an actual public health hazard through injury, poisoning, or spread of disease. An example is reclaimed water which is water, as a result of treatment of wastewater, is suitable for a direct beneficial use or a controlled use that would not otherwise occur such as settling ponds for aquifer recharge or irrigation use. Regulations prohibit overspray, runoff and ponding of reclaimed water used for irrigation. Reclaimed water is NOT safe for human consumption.

   3. Low Hazard: A cross connection that could impair the quality of potable water to a degree that does not create a hazard to the public health, but does adversely and unreasonably affect the aesthetic qualities of potable waters for domestic use.

B. Determine proper backflow protection based on the degree of hazard.

<table>
<thead>
<tr>
<th>Hazard</th>
<th>Protection</th>
</tr>
</thead>
<tbody>
<tr>
<td>Severe Health</td>
<td>AG/RP (air gap or reduced pressure backflow)</td>
</tr>
<tr>
<td>High Health</td>
<td>RP (reduced pressure backflow assembly)</td>
</tr>
<tr>
<td>Low</td>
<td>DC (double check valve assembly)</td>
</tr>
</tbody>
</table>
Application

1. Backflow protection for all commercial structures new or remodeled shall be a Reduced Pressure Backflow Assembly. (See City standards for installation requirements). This assembly shall be installed prior to the City Of Olympia releasing water meter.

2. Residential Irrigation systems shall be required to install a Double Check Valve Assembly (see City standards for installation requirements).

3. All Class 1,2,3,4 Fire Sprinkler Systems shall be required to install a Double Check Detector Assembly (see City standards and Olympia Fire Department installation requirements). This is for all sprinkler systems that do NOT have an injection system or an auxiliary water source.

4. All Class 5 & 6 Fire Sprinkler Systems shall be required to install a Reduced Pressure Detector Assembly (see City standards and Olympia Fire Department installation requirements). This is required for any system with injection or an auxiliary water source.

5. The order of events for installation of backflow assemblies is:
   - Contractor or Inspector calls for inspection.
   - City CCS determines type of hazard.
   - City CCS selects and inspects proper backflow assembly commensurate with degree of hazard.
   - City CCS inspects for proper installation (orientation, approval, hazard).
   - Meter is released upon proper installation. CCS is contacted for all irrigation & commercial meter sets by CP&D for Cross Connection Inspection prior to setting meter & turning on water.
   - Assembly is tested by City Of Olympia CCS, or certified private tester if the CCS is not available.
   - Inspection is signed off.

6. What to do if assembly is not correct:
   - Contact inspector or contractor.
   - Turn off & lock off service.
   - Inform Water Shop & Utility Billing so meter does not get set until correction has been completed.
   - When in doubt take pictures.

7. Documentation:
   - Record assembly information such as Make, Model, Serial#, Size, Location and Hazard.
   - Date & Time.
   - Contact Person or Company.
Note any discrepancies.

8. New Construction:

- All new main construction over 20 feet in length requires a double check valve to fill & flush. This backflow assembly shall pass the certification test (certification test is initial backflow assembly test using Washington State Testing Procedures done by City Of Olympia CCS, or certified private tester if CCS is not readily available) prior to use and shall remain in place if inline with the new main until a passing bacteriological test is confirmed by the testing lab.

- Exemptions to this requirement must be made by the City Of Olympia CCS such as length of pipe is close to 20’ or circumstances don’t allow the installation of a backflow assembly.

- No new main shall be accepted for use without a passing bacteriological test from an approved laboratory.
SOP # 27 Determining Unauthorized Connections to Reclaimed Water

Note: Only City Of Olympia Certified Cross Connection Specialist (CCS) is authorized to assess reclaimed water sites.

References:
- Ordinance 6321, City of Olympia Engineering Design & Development Standards Chapters 6 and 10
- Cross Connection Control Level of Protection SOP # 20

1. A site to receive reclaimed water shall be inspected prior to service connection to determine the location of potable water uses, the number of potable services to site and the complexity of plumbing on site.

2. Record in writing and photograph, if necessary, any and all “possible” connection locations for reclaimed and potable water on the entire site to receive reclaimed water.

3. Document all potable water hose bibs, drinking fountains, playground equipment, or anything that could possibly receive overspray from the reclaimed water system.

4. To determine if there are any connections to the potable water system at sites where there is reclaimed water:
   - Contact LOTT and find out what their water quality results are that morning for conductivity, chlorine residual and nitrate.
   - Collect a water sample from the potable water system and field test it for conductivity, chlorine residual and nitrate (typically conductivity will be less than 110 m-ohms/cm, chlorine residual around 0.8 mg/L and nitrate non-detect).
   - Compare the results from both water systems.
   - If the results are similar, a cross connection is suspected so proceed with the shut down test below.

5. Shut down test
   - Shut the supply to the reclaimed water off.
   - Drain reclaimed water system.
   - Isolate reclaimed water system at source leaving all downstream valves on.
Appendix F – Standard Operating Procedures Associated Cross Connection Control

- Leave potable water system on.
- Connect pressure gauge to reclaimed water system.
- Leave reclaimed system off for 30 minutes and watch gauge to see if pressure increases.
- Should pressure increase in reclaimed system shut down all water sources to site.
- Inspect for cross connection(s) between potable & reclaimed water systems.

6. To determine if there are any connections to the reclaimed water system from the potable water system.
   - Shut off supply to potable water system.
   - Drain pressure off potable water system.
   - Isolate potable water system leaving all downstream valves open.
   - Leave reclaimed water system on.
   - Connect pressure gauge downstream of Reduced Pressure Backflow Assembly located on potable water system.
   - Leave reclaimed system on & potable water system off for 30 minutes (if possible) and watch pressure gauge.
   - Should pressure increase in potable water system shut down all water sources to site.
   - Inspect site for cross connection(s) between potable & reclaimed water systems.

7. Should any cross connections be found refer to Water Quality SOP #20 titled Cross Connection Control Level of Protection.

8. Sites with reclaimed water plumbed to them will automatically be required to install a Reduced Pressure Backflow Assembly as close to the domestic water meter as possible. There shall be no connection between the water meter and the backflow assembly. This work will need to be done prior to any reclaimed water use.

9. Pressure testing of sites with reclaimed water shall mean testing both inside and outside of any building on the affected site to be sure there are no cross connections or possibility of reclaimed water contaminating the potable water system.

10. All signage and exposed reclaimed water piping labels shall be properly installed prior to reclaimed water use. Also all requirements must be met in Reclaimed Water Standards especially in section 10.24 (Submittals) prior to use.

11. Documentation of all pressure testing for any site using reclaimed water and potable water shall be detailed and kept with the City Of Olympia CCS and Water Quality Supervisor.
Appendix F – Standard Operating Procedures Associated Cross Connection Control

**SOP # 29 INSPECTION AND TESTING OF BACKFLOW ASSEMBLIES OF WATER SERVICES WITH RECLAIMED WATER**

Note: Backflow assemblies are inspected and tested at their initial installation and annually thereafter.

**Equipment list:**
- 5-valve differential pressure test kit specifically designated for reclaimed water use
- Backflow assembly test report

1. Customer receives written notification of annual testing.
2. Inspect assembly to determine the condition of fittings.
3. Observe whether leakage is occurring and that assembly continues to be in an acceptable condition and appropriate for site.
4. Turn off water, meanwhile observing assembly to ensure there is no leakage.
5. Flush test cocks in order specified:
   - Open and leave open TC #4, TC#3, TC, #2, and TC #1.
   - Then close TC #1, TC #2, TC #3, and TC #4.
   - Install appropriate fittings to test and cocks if needed.
6. Connect test kit:
   - High side hose to test cock #2.
   - Low side hose to test cock #3.
   - Close all test kit valves.
7. Purge:
   - Open TC #3.
   - Open low bleed valve (leave it open).
   - Open TC #2 slowly.
   - Open high bleed valve (leave it open).
8. Isolate:
   - Close shut-off valve #2 to isolate.
   - Close high bleed valve after the air is gone.
   - Close low bleed valve after needle on gauge reaches upper limits.
   - Record the apparent static pressure drop across CV #1.
9. Test operation of differential relief valve and increase zone pressure:
   - Open high control valve.
   - Open low control valve maximum of one-quarter (¼) turn.
   - Place hand under relief valve vent.
   - Record differential pressure in pounds per square inch (psid) at first drip.
   - Close low control valve.
10. Test check valve #2 and increase downstream pressure:
Appendix F – Standard Operating Procedures Associated Cross Connection Control

- Purge vent hose, connect to TC #4.
- Open and close low bleed valve to reestablish differential.
- Open vent control valve and wait for gauge needle to stabilize.
- Record status (closed tight or leaked).
  Note: Leave the vent valve open.

11. Test check valve #1 and reestablish differential:
- Open and close low bleed valve to reestablish differential
- Record psid across #1 check valve.

12. Return to service.
- Close all test cocks.
- Slowly open shut-off valve #2.
- Remove all test equipment.


14. Fill out test report in an accurate and legible manner.

15. If assembly does not pass inspection, customer will be notified of results and a follow-up inspection will be required after repairs.
SOP # 30 INSPECTION OF POTENTIAL SITES FOR RECLAIMED WATER SERVICE

Equipment list:
• City of Olympia Correction Notice Form – see attached

1. Identify the site to receive reclaimed water and the approved type of use of reclaimed water. City will receive notification of site through application for reclaimed water service through Community, Planning and Development.
2. Schedule an inspection with the site owner/manager if there are buildings present on site.
3. Trace and locate all plumbing on site, including plumbing located inside buildings. Record any deficiencies such as cross-connections or possible hazards.
4. Complete write-up of hazards found and corrections needed.
5. Schedule time to explain information to customer if needed.
6. Follow-up inspection of any possible installations and testing if needed.
7. Turn reclaimed water on once proper backflow is installed and tested by City of Olympia using Water Quality SOP #29 titled *Inspection and Testing of Backflow Assemblies on Reclaimed Water.*
City of Olympia  
PO Box 1967  
Olympia, WA  98507-1967

Call 360.753.8161 when completed.

CORRECTION NOTICE

Project/Building Name: _______________________________  Date: ____________
Address: ___________________________________________ File #: ____________

The following items need completion or correction before acceptance of the project can be given by the City of Olympia, Public Works, Water Operations Section:

______________________________________________________________________________
______________________________________________________________________________
______________________________________________________________________________
______________________________________________________________________________
______________________________________________________________________________
______________________________________________________________________________
______________________________________________________________________________
______________________________________________________________________________
______________________________________________________________________________
______________________________________________________________________________
______________________________________________________________________________
______________________________________________________________________________
______________________________________________________________________________

Received by  Issued by

Date Reinspected: ________________  By: ________________  Items corrected: _________

Remarks:

______________________________________________________________________________
______________________________________________________________________________
______________________________________________________________________________
______________________________________________________________________________

Distribution:
WHITE – Inspection site  
CANARY – Water Section files  
PINK - Recall
This document contains the 10 minimum elements required under WAC 246-290-490 and provides the details supportive of Olympia Municipal Code 13.04.110.
Table of Contents
Chapter 1 – Introduction .............................................................................................................. 4
  PURPOSE AND SCOPE ............................................................................................................... 4
  DEFINITIONS ............................................................................................................................ 4
  CITY, STATE, AND FEDERAL PROGRAM HISTORY ............................................................... 6
Chapter 2 – Legal Authority to Establish a Program (Element 1) ...................................................... 7
Chapter 3 – Program Administration ............................................................................................ 8
  ROLES AND RESPONSIBILITIES .......................................................................................... 8
Chapter 4 – Program Implementation ............................................................................................ 10
  PROCEDURES AND SCHEDULE FOR HAZARD EVALUATIONS, ELIMINATING OR CONTROLLING CROSS CONNECTIONS (ELEMENTS 2 AND 3) ........................................... 10
    Commercial/Industrial Service .............................................................................................. 11
    Multi-Family Service ........................................................................................................... 11
    Fire Service ......................................................................................................................... 11
    Single-Family Residential Service ....................................................................................... 12
    Irrigation Only Service ....................................................................................................... 12
  DESIGNATE AT LEAST ONE PERSON CERTIFIED AS A CCS (ELEMENT 4) ....................... 12
  PROCEDURES AND SCHEDULE FOR BACKFLOW PREVENTER INSPECTION, TESTING AND REPAIRS (ELEMENT 5) ................................................................................................................ 12
  QUALITY ASSURANCE PROGRAM (ELEMENT 6) .................................................................. 14
  RESPONDING TO BACKFLOW INCIDENTS (ELEMENT 7) ...................................................... 14
  PUBLIC EDUCATION (Element 8) .......................................................................................... 14
  RECORD KEEPING AND REPORTING (Element 9) .................................................................. 14
    DOH Annual Summary Report Reporting (ASR) ................................................................. 15
    Master List ........................................................................................................................... 15
    Inventory of Backflow Prevention Assemblies .................................................................... 15
    Annual Test Report Results Retention ............................................................................... 15
  SPECIAL REQUIREMENTS FOR RECLAIMED WATER (ELEMENT 10) ............................. 15
Appendix A – Extract from chapter 246-290 WAC Group A Drinking Water Rules
Appendix B – Extract from Olympia Municipal Code 13.04
Appendix C – Procedure for Issuing a Civil Infraction
Appendix D – City of Olympia Test Report Form
Appendix E – Department of Health Backflow Incident Report Form
Appendix F – Standard Operating Procedures Associated Cross Connection Control
Chapter 1 – Introduction

PURPOSE AND SCOPE
This Cross Connection Control Procedures Manual (Manual), used in conjunction with Olympia Municipal Code (OMC) 13.04 and state regulations WAC 246-290-490, outlines the framework for implementing cross connection control requirements at the City of Olympia. To be acceptable to the Washington State Department of Health (DOH), a cross connection control program must include 10 minimum program elements listed in WAC 246-290-490(3). How the City meets those elements are described in this Manual.

This Manual reflects years of implementation practices in protecting the City’s drinking water supply from cross connections and backflow incidents using industry standards and good engineering practices. The Manual provides direction to staff on program implementation activities, describe policies and procedures, and summarize current City, state, and federal requirements regarding cross connection control. The Manual is structured such that it may be supplemented with updated documents and materials developed by Public Works, Water Resources for its specific use. The authority to enforce these practices and policies is established in OMC 13.04.110 and 440, and adopted by Ordinance 6774 (October 8, 2011).

Cross connection control is an integral part of the multiple-barrier approach to ensure safe drinking water. This multiple barrier concept includes providing protection to the City’s water supply through: source protection programs like wellhead protection areas, providing treatment (disinfection), covered storage tanks, using good engineering design and practices, implementation of a cross connection control program, compliance and surveillance water quality monitoring programs, having certified operators, and emergency planning. The mission of Water Resources is To Provide and Protect Nature’s Water for a Healthy Community. Implementation of the Manual results in protecting the City’s water system from contamination from the customer’s plumbing supply/system through proper installation of the right backflow prevention assembly and annual testing of these assemblies by a DOH certified Backflow Assembly Testers (BAT).

DEFINITIONS
The following words are frequently used throughout the Manual and their definitions are as follows:

“Approved air gap (AG)” 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. This 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 (AVB)” means an AVB or make, model, and size that is approved by the DOH. 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 authority having jurisdiction are considered approved by the DOH.

“Approved backflow prevention assembly” means a reduced pressure backflow assembly (RPBA), a reduced pressure detector assembly (RPDA), a double check valve assembly (DCVA), a double check detector assembly (DCDA), a pressure vacuum breaker assembly (PVBA), or a spill resistant vacuum breaker (SVBA) of make, model, and size that is approved by DOH. 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 DOH are considered approved by the DOH.

“Authority having jurisdiction” (formerly known as 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.

“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.

“Cross connection” means any actual or potential physical connection between a public water system or the consumer’s water system and any source of nonpotable liquid, solid, or gas that could contaminant the potable water supply by backflow.

“Category of contaminant” means a communicable disease, chemical, or physical hazard. Communicable diseases and chemical hazards can cause illness and in some cases death and are high health hazards. Physical hazards such as gasoline, propane, hot water and steam are examples of both low and high health hazards.

“Degree of hazard” means either a low cross connection hazard or a high health cross connection hazard.

“High health cross connection hazard” means a cross connection involving any substance that could impair the quality of potable water and create and actual public health hazard through injury, poisoning, or spread of disease. WAC 246-290-490 refers to these types of hazards as Table 9 hazards.

“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.

“Low cross connection hazard” means a cross connection that could impair the quality of potable water to a degree that does not create a hazard to the public health, but does adversely and unreasonably affect the aesthetic qualities of potable waters for domestic use.
“Premises isolation” means a method of protecting a public water system by installation of approved air gaps or approved backflow prevention assemblies at or near the service connection or alternative location acceptable to the purveyor to isolate the consumer’s water system from the purveyor’s distribution system.

“Purveyor” means an agency, subdivisions 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 or these entities.

See Appendix A for a copy of DOH’s publication which contains an extract of chapter 246-290 WAC, which covers minimum cross connection control requirements as well as additional definitions.

CITY, STATE, AND FEDERAL PROGRAM HISTORY
The requirement for the City to have a Cross Connection Control Program (Program) is not something new. State regulations administered by DOH, dating back to 1970; require the City’s water system be protected from backflow and cross connection contamination. Though the federal Safe Drinking Water Act (SDWA) passed by Congress in 1974 does not specifically address the topic of cross connection control, it does state water purveyors are responsible for the water quality delivered to the customer’s meter. The Environmental Protection Agency, which administers the SDWA, developed a series of nine “white papers” (2001) on distribution system issues of potentially significant public health concern. One of the papers is titled Potential Contamination Due to Cross Connections and Backflow and the Associated Health Risks. Water industry experts expect future federal rule making will require water purveyors to develop and implement a cross connection control program. The City is well positioned to meet any future federal requirements pertaining to having a Program given the years DOH has had state regulations requiring one.

The City’s Program was developed in the mid-1990s. The City has made great progress over the last few years in our efforts to develop and implement an effective Program. These efforts include updating the OMC, replacing Program software, having dedicated administrative support, and protecting against the most severe and high health risk premises (commonly referred to as Table 9 facilities).
Chapter 2 – Legal Authority to Establish a Program (Element 1)

The control or elimination of cross connections is done according to the most current revisions of state and local rules and regulations. State regulations include:

- RCW 19.27, Washington State Building Code
- RCW 43.20.050, Washington State Powers and Duties of the State Board of Health
- RCW 70.119A.060, Washington State Public Water Systems Mandate
- WAC 246-290-490, Cross Connection Control (Appendix A)

Local rules and regulations include OMC chapter 13.04, which is the authority for the City to enforce the City’s Program (Appendix B). Section 13.04.110, states cross connections are prohibited and gives the City authority to discontinue water service until correction is made. Where cross connections cannot be eliminated, they are controlled by installation of an approved backflow assembly preventer(s) which are appropriate to the degree of hazard it is protecting against. Section 13.04.440, details the penalties for non-compliance, which are a misdemeanor and/or civil penalty. Each day is a separate violation with the first offense penalty of $103, second offense of $257 and the third offense is $513. If a more serious penalty of a misdemeanor is determined, a fine not to exceed $1,000 and or imprisonment not to exceed 90 days is imposed. In the event of a continuing violation or failure to comply, the second and subsequent days shall constitute a gross misdemeanor punishable by a fine not to exceed $5,000 and or imprisonment not to exceed 365 days. A copy of the procedure for issuing civil penalties under the OMC can be found in Appendix C.

Ordinance 6844 (March 2013) adopted the most recent version of the City’s Engineering Design and Development (EDDS). The EDDS contains the requirements for civil engineering infrastructure as adopted by the Olympia City Council. The EDDS is comprised of both written text and standard details that specify how infrastructure is constructed. These improvements include streets, driveways, sidewalks, curbs, street lighting, street trees, water, sewer, storm drainage, and solid waste. Chapter 6 contains the requirements for cross connection control associated with all new construction and remodels and can be found online at olympiawa.gov/ Chapter 10 contains the requirements for cross connection control associated with reclaimed water and can also be found online at olympiawa.gov/
Chapter 3 – Program Administration

ROLES AND RESPONSIBILITIES
The Water Resources Line of Business, within the City’s Public Works Department, carries out the planning and operational functions of the City’s public water supply. All public water systems the size of the City’s water system, are required to designate a certified operator as the purveyor. The purveyor position currently resides in the Pump Stations Program. The water purveyor has the responsibility for cross connection control and it 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 (e.g. premises isolation).

The water purveyor has the responsibility of premises isolation. The practice of premises isolation is used to protect against cross connections on the customer’s premise where actual or potential hazards exist. Under this philosophy, the customers premise is separated from the City’s water system by means of a backflow prevention assembly installed at the service connection, immediately downstream of the water meter.

The City’s Community Planning and Development (CP&D) has the authority and jurisdiction for any issues within the consumer’s water system, per chapter 19.27 RCW. This type of protection is often referred to as “in-premise” isolation. In-premise isolation protects the health of the consumers served by their water/plumbing system by the installation of an approved air gap or approved backflow prevention assembly at the point of hazard.

The water customer is responsible for identifying and eliminating cross connections or controlling them through the installation, regular testing, and maintenance of approved backflow prevention assemblies. The water customer is responsible for providing the necessary information, scheduling, and providing access for inspection of cross connection potential and the necessary control methods. The water customer is responsible for notifying the City’s Cross Connection Control Specialist (CCS) of any assembly the customer believes is no longer required. Finally, the water customer is responsible for all costs associated with the inspection, testing, repair, and replacement of backflow prevention assemblies.

The City’s Program consists of premises isolation to protect the City’s water system from contamination.

The functions of the Program are primarily carried out by the City’s CCS and include survey, inspection, testing, notification, enforcement, and record keeping. The minimum City certification requirements for the position include DOH certifications as a CCS and BAT.

This position works closely with CP&D inspectors regarding new and remodeled properties; Technical Services engineers on capital improvement projects; DOH, Office of Drinking Water on severe and high health hazard premises and backflow incidents; Thurston County Environmental Health on backflow incidents; contractors and BATs.
The inspection, repair, and annual testing of backflow prevention assemblies for City sewer pump stations is done by City staff in the Water Resources' Pump Stations Program who is a certified BAT. This same work for City parks is done by City Parks, Arts and Recreation Program staff who is a certified BAT, while the City’s Fire Department contracts out this work. Inspection, repair, and annual testing of backflow prevention assemblies for other City facilities are done by either contracting out with a BAT, or by the City’s CCS.
Chapter 4 – Program Implementation

PROCEDURES AND SCHEDULE FOR HAZARD EVALUATIONS, ELIMINATING OR CONTROLLING CROSS CONNECTIONS (ELEMENTS 2 AND 3)

Several guidance, policies, and procedures exist for determining the appropriate level of protection. The evaluation for the appropriate level of protection shall be in accordance with the most current editions of the following:

- *Cross Connection Control Manual, Accepted Procedure and Practice* published by the Cross Connection Control Committee of the Pacific Northwest Section of the American Water Works Association
- *Manual of Cross Connection Control* published by the Foundation for Cross Connection Control and Hydraulic Research, University of Southern California
- *Recommended Practice for Backflow Prevention and Cross Connection Control, AWWA M14*, published by the American Water Works Association
- *Engineering Design and Development, Chapter 6 (Drinking Water)*, City of Olympia
- *Engineering Design and Development, Chapter 10 (Reclaimed Water)*, City of Olympia
- *Group A Design Standards*, Washington State Department of Health

The City also enacted various policies to ensure the safety and quality of drinking water for all its customers. Many of these policies are referenced in the approved 2009 – 2014 Water System Plan.

The City prioritizes its backflow prevention efforts based on acceptable risk (probability of occurrence), category of contaminant, degree of hazard, and the reliability of the backflow preventer. The City developed an action plan in 2006, identifying unprotected Table 9 hazards and notified these water customers of backflow prevention requirements. It took some time to work through the backlog of premises needing backflow preventers installed. However, all known Table 9 premises were successfully eliminated or protected in 2014.

For customers requesting new service connections, an initial evaluation of the premises’ planned or future water service is done by the City’s CCS during the plan review process. Before water service is provided, the City’s CCS inspects the initial installation and does the initial testing. Proper selection and installation of a backflow prevention assembly, as determined by the City’s CCS, shall be a condition of allowing new water service connection. If the City’s CCS is unavailable, installation and testing by a certified BAT is required. If the initial test fails, it is the responsibility of the applicant/contractor/customer to immediately have the assembly repaired and retested by a certified BAT. All assemblies must be tested at least annually thereafter by a certified BAT.

Approved backflow prevention assemblies are those which appear on DOH’s Approved Assemblies List, developed by the University of Southern California Foundation for Cross Connection Control and Hydraulic Research.
Research. This institute is currently the only one which the DOH recognizes as having the authority to approve backflow prevention assemblies. The backflow prevention assemblies include:

1. Atmospheric Vacuum Breakers (AVB)
2. Reduced Pressure Principle Backflow Assembly (RPBA)
3. Double Check Valve Assembly (DCVA)
4. Pressure Vacuum Breaker Assembly (PVBA)
5. Spill-Resistant Vacuum Breakers (SVBA)

All backflow assemblies shall operate as designed and approved by the approval agency having jurisdiction. Assemblies not meeting design standards shall be considered unapproved and will require repair or replacement.

The City’s CCS becomes aware of possible cross connections associated with existing service connections through the course of doing City business. Periodic reevaluations are done by the City’s CCS in response to remodels, notification by city inspectors, fire department personnel, water quality complaints or concerns with reclaimed water. An emphasis is placed on severe and high health premises (Table 9) followed by low hazard premises. The City notifies the customer of the outcome of the hazard assessment by letter and in some cases by email. Timelines for corrections are based on the degree of hazard and are generally completed within 30 days. Larger and more complex premises can require additional time (six months or longer) due to securing adequate funding to complete the installation(s). The assemblies must also be on DOH’s Approved Assemblies List and be installed in the correct orientation, and by a certified BAT.

Unless otherwise approved by the City’s CCS, installation of the appropriate type of backflow prevention assembly or air gap system for premises isolation is required at the meter (e.g. premises isolation). Any deviation from this must be pre-approved by the City’s CCS. Below is a summary of requirements based on the evaluation of acceptable risk, degree of hazard, and the reliability of the backflow preventer:

**Commercial/Industrial Service**
The degree of hazard for these types of services is a high health cross connection hazard. An approved premise isolation cross connection control assembly of a RPBA, RPDA or approved AG.

**Multi-Family Service**
The degree of hazard for this type of service is a high health cross connection hazard. A residential development having one or more metered connections serving more than two living units per meter will be treated as a commercial service.

**Fire Service**
The degree of hazard for this type of service may be high or low, depending on the type of system installed. For example, backflow protection is not required for residential flow through or combination fire protection
systems. However, dry fire suppression systems require a DCDA while a fire suppression system using chemicals requires an RPDA.

**Single-Family Residential Service**
The degree of hazard for this type of service is generally low. However, premises isolation with a RPBA is required if high health hazards exists.

**Irrigation Only Service**
The degree of hazard for this type of service is generally low. An approved DCVA is required as long as no chemicals are involved, otherwise an RPBA is required.

**DESIGNATE AT LEAST ONE PERSON CERTIFIED AS A CCS (ELEMENT 4)**
The certified operator in “responsible charge” as the CCS for the City’s Program currently resides in the Water Resources Line of Business and is in the Water Operations Section. This individual has the authority and responsibility to develop and implement the Program. Also there are 12 additional City water personnel who hold CCS certifications and one with BAT certifications.

**PROCEDURES AND SCHEDULE FOR BACKFLOW PREVENTER INSPECTION, TESTING AND REPAIRS (ELEMENT 5)**
There are over 2,300 backflow assemblies installed in the City’s service area which require annual testing. The due date for testing is based on the installation date of the assembly, not when the assembly was last tested. Notification of annual testing is sent out approximately 30 days from installation date. The Program invested in new software (XC2) in 2010 to maintain an inventory of all these assemblies and test history data. This database also generates custom reports (e.g., DOH Annual Summary Report), annual testing notification letters, and repair letters to customers.

The testing frequency of backflow assemblies and approved air gaps, used in place of assemblies, are done:

- At Initial installation
- After the assembly is repaired or moved
- Immediately after a backflow incident occurs
- Annually after the initial installation
- As required by the CCCS, if testing indicates repeated failures

The exception to the above testing frequency is with the LOTT wastewater treatment plant and the City’s sewer pump stations, where testing is required every six months.

The test procedures used are those specified in the most recent edition of the *Manual of Cross Connection Control*, published by the University of Southern California Foundation for Cross Connection Control and Hydraulic Research, which in currently the 10th edition, and approved by DOH. There are no alternate test procedures allowed.
The testing notification to customers is done automatically through XC2 software based on the installation date of the assembly. Customers are sent up to three notification letters (first notice – 30 days; second notice – 30 days, final notice – 14 days) informing them annual testing is due. Prior to shut off of water, courtesy phone calls are made and where necessary, a site visit is made. This same notification process is used for dealing with installations and repairs.

The majority of completed test reports are emailed within 10 days from the date the test was performed. If the premises involves a separate irrigation line, the meter shall be locked or the hazard eliminated by removing piping so a connection is not possible. The City’s notification letters provides the website address to Washington Certification Services, where customers can obtain a public listing of certified BATs to have their testing done by.

The updating of OMC 13.04 strengthens the requirement of annual testing and the City’s enforcement capabilities. Also investing in new software (XC2) for tracking and notification activities, and assigning a program assistant to the program has freed up the City’s CCS time to be more in the field.

No appeals process is necessary prior to turning off water service because customers are given adequate notification of testing requirements and staff is flexible in working out schedules with them.

BATs can use their own test report form provided it includes the minimum test reporting elements found in Appendix D. If the minimum test reporting elements are not provided, then the test report will be denied and the City’s CCS may require the re-testing of the assembly in his presence. Test results are to be emailed, mailed or faxed to the CCCS within 10 days and contain the signature and printed name of the BAT. The results are then hand entered into the XC2 database. When the field test report shows an assembly has failed its test, the City requires the customer to repair the assembly and return it to proper working condition in an amount of time to be determined on a case-by-case basis, depending on the hazard.

Multiple assembly failures of an assembly will result in the property owner having the assembly repaired or replaced by a certified BAT with an assembly appropriate for the degree of hazard.

The City will notify the DOH, Office of Drinking Water when it suspects a test report is falsified in order for their follow-up.

Retesting may be required, at the City’s discretion, on backflow assemblies which have questionable test results or on assemblies which have test report information which has changed (e.g., the serial number, model number, location, or other information does not match information provided at the time of installation) and no prior notice was given.
QUALITY ASSURANCE PROGRAM (ELEMENT 6)
The City uses XC2 software (Tokay prior to that) to track both BAT certification and test kit accuracy verification and calibration information. Test results can’t be entered into the system if either one of these has lapsed. Also BATs are required to submit in a copy of their current certification card and current test kit calibration information annually. The BAT certification information is checked against information provided from Washington Certification Services.

BATs are notified immediately if the test report contents are incomplete or incorrect. Correction generally occurs within a week.

The City requires BATs to submit current copies of their DOH certification (or renewal) and test kit verification of accuracy every January. The City also requires minimum test report content, which can be found in Appendix D.

RESPONDING TO BACKFLOW INCIDENTS (ELEMENT 7)
In the event of a cross connection incident, which contaminates the City’s water supply, or occurs within the premises of a consumer served by the City, the City will notify DOH, CP&D, and the Thurston County Health Department as soon as possible after the incident, but no later than the end of the next business day. The City’s response includes an onsite inspection to determine the extent of the backflow event and depending on the nature of the event, samples may be taken, the water line flushed, or the water turned off to contain the contamination. If the incident occurs after hours, staff will contact DOH using their emergency after hours phone number (1-877-481-4901). The City will document the details of the backflow incident using DOH’s Backflow Incident Report Form found in Appendix E. Additional supporting information such as photographs and sampling results (if taken) are attached to the report. Generally there is a follow-up meeting with DOH staff to discuss the incident and actions taken. Also the City will include all backflow incident report(s) as part of the ASR.

PUBLIC EDUCATION (Element 8)
The City’s primary educational effort involves using the City’s spring/summer utility bill insert to convey the importance of preventing cross connections and maintaining backflow prevention assemblies through annual testing. The annual Consumer Confidence Report has also been used to share this information. The City’s website is also another avenue used to inform the public about the importance of preventing cross connections. Lastly the City has a brochure, which is made available to home improvement businesses, and used at various City events promoting water conservation and backflow prevention.

RECORD KEEPING AND REPORTING (Element 9)
Original records, such as project submittals, correspondence, plans, etc., are kept on file, either directly with the City’s CCS, or if in conjunction with a larger project, on file with CP&D Department. Eventually these files are archived according to retention schedules set forth in chapter 40.14 RCW and chapter 246-290 WAC. Records
are kept both in paper and electronic format. As mentioned previously, annual test results are emailed, faxed or mailed, and results entered into the XC2 database. The City’s VUE Works work order system is also used to track time spent testing, repairing, or installing an assembly associated with City facilities. Notification and violation letters along with emails are records which are also kept. These records will form the basis of any enforcement action or legal defense by the City. The master list, inventory information, list of approved AVBs, and ASR records are available to DOH upon request.

**DOH Annual Summary Report Reporting (ASR)**

2001 was the first reporting year of ASR data to DOH. DOH efforts are focused on larger utilities reporting this information (greater than 1,000 connections) and compliance with Table 9 facilities.

**Master List**

The XC2 database maintains a master list of service connections of severe, high and low hazards for as long as the hazard exists. It is from this database the annual notification letters are generated and sent.

**Inventory of Backflow Prevention Assemblies**

The XC2 database maintains the inventory of active and inactive assemblies including the exact assembly location, assembly description (type, manufacturer, model, size and serial number), and the assessed degree of hazard, the installation date, history or inspection, tests and repairs, test results and the person performing the inspection. Approved air gaps installed in lieu of approved assemblies will include the same information as that of mechanical backflow prevention assemblies. The City does not allow atmospheric vacuum breakers (AVBs) for irrigation protection, therefore, there is no record keeping associated with AVBs. However, AVBs are allowed for in-premise use but a higher form of backflow protection is required upstream at the meter.

**Annual Test Report Results Retention**

Though state regulations require retention of all test results for five years, currently, all hard copies and electronic test reports are being kept indefinitely because the City currently has the capacity to store theses records.

**SPECIAL REQUIREMENTS FOR RECLAIMED WATER (ELEMENT 10)**

The degree of hazard for this type of service is a high health hazard. A RPBA will be required on the water service to properties which both potable and reclaimed water are present. Where potable water is being used for makeup water for reclaimed water uses, the potable water supply must be protected with an air gap system.

LOTT’s Budd Inlet Treatment Plant generates Class A reclaimed water, which the City uses within the City’s limits. Reclaimed water is used for irrigation at Heritage and Marathon Parks and at Percival Landing and Percival Landing Park. Reclaimed water is also used at the Port of Olympia, new LOTT Administration Building (toilet flushing), the Eastbay Plaza restrooms and at the new Hands on Children’s museum (toilet flushing and outdoor water feature). An approved air gap system is installed at the new LOTT Administration Building, the Hands on Childrens Museum and the Eastbay Plaza restrooms because of the presence of both reclaimed water and potable water within the premises. The LOTT’s wastewater treatment plant will have an approved air gap.
system completed in 2015, in conjunction with the construction of the new sedimentation basins. The approved air gap system is/will be inspected by the CCS annually. The remaining premises receiving reclaimed water are protected by a reduced pressure backflow preventer located near the meter and tested annually.

The Program also developed several standard operating procedures (SOPs), which are associated with determining the level of protection needed based on the degree of hazard including several SOPs associated with connections which receive both potable water and reclaimed water. These SOPs include determining unauthorized connection to reclaimed water, inspection and testing of backflow assemblies of water services with reclaimed water, and inspection of potential sites for reclaimed water service. A copy can be found in Appendix F.