



Mukilteo Water and Wastewater District
7824 Mukilteo Speedway
P O Box 260
Mukilteo, WA 98275-0260
425-355-3355 (Fax) 425-348-0645

PREMISE ISOLATION
CROSS-CONNECTION CONTROL PROGRAM

Purpose:

The purpose of the Mukilteo Water and Wastewater District cross-connection control program shall be to protect the public water system, as defined in WAC 246-290-490 from contamination via cross-connections.

General Policy:

It is the intention of this policy to provide for the permanent abatement or control of all cross-connections under the control of the Mukilteo Water and Wastewater District. Where it is officially, actually and/or economically unfeasible to find, eliminate or to permanently control all cross-connections of the consumer's water system, and when it is mandated by WAC 246-290-490 and/or deemed necessary by the District cross connection control specialist (District CCS), there shall be installed at the District water service connection an approved backflow prevention assembly commensurate with the assessed degree of hazard posed by the consumer's water system upon the public water supply.

Code Authority and Enforcement:

The enforcement of this cross-connection control program in the area served by the District, will be in accordance with WAC 246-290-490, Cross-connection control, effective April 9, 1999, District Resolution No. A-1456 dated April 30, 2003 and the Mukilteo Water and Wastewater District Cross-Connection Control Program.

General:

Except where specifically designated herein, all words used in this procedure shall carry their customary meanings. Words used in the present tense include the future, and plural includes the singular: The word "shall" is always mandatory; the word "may" denotes a use of discretion in making a decision.

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 nonpressurized receiving vessel. To be an air gap approved by the District, the separation must be at least:

- Twice the diameter of the supply piping measured vertically from the overflow rim of the receiving vessel, and in no case be less than one inch, when unaffected by vertical surfaces (sidewalls); and
- Three times the diameter of the supply piping, if the horizontal distance between the supply pipe and a vertical surface (sidewall) is less than or equal to three times the diameter of the supply pipe, or if the horizontal distance between the supply pipe and intersecting vertical surfaces (sidewalls) is less than or equal to four times the diameter of the supply pipe and in no case less than one and one-half inches.

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

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

“Approved backflow prevention assembly” means an RPBA, RPDA, DCVA, DCDA, PVBA, or SVBA of make, model, and size that is approved by the District. 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 District are considered approved by the District.

“Assessment of risk” shall express the results of an evaluation of a health system, or plumbing hazard. The evaluation required in making a determination of the type of backflow preventer needed to isolate a specific cross connection (e.g., a plumbing fixture), or a group of cross connections contained within a facility or complex of facilities (e.g., a shopping mall) is comprised of the following steps:

- Determine the degree of potential health hazard risk to the public water system. (In assessing the purveyor’s risk of contamination of the public water system, if knowledge of the degree of hazard posed by a substance is not known, the purveyor must assume that it is high. Generally, almost all substances other than potable water are considered a health hazard of some degree).
- Determine the high or low probability that a cross-connection may occur.
 1. The probability increases that an existing cross-connection will go undetected as the complexity of a piping system increases.

2. Piping changes will create new cross-connections, or change the operating conditions from backsiphonage to backpressure conditions.
 3. A backflow preventer could be by-passed or removed from service.
 4. A substance could be changed or increase in strength.
 5. A substance may deteriorate, and thus become a health hazard.
 6. A substance, when combined with the chemicals in the potable water supply, or when exposed to certain piping material, may react and form a compound that poses a health hazard, such as CO₂ mixing with water to form carbonic acid that leaches copper from a service pipe.
 7. A substance, if it contains a bacteriological contaminant, could become a health hazard long after it enters the potable water supply, through bacteria re-growth.
- Determine the risk level acceptable to the purveyor, and
 - Determine the reliability required of the backflow preventer.

“Authorized agent” means any person who:

- Makes decisions regarding the operation and management of a public water system whether or not he or she is engaged in the physical operation of the system;
- Makes decisions whether to improve, expand, purchase, or sell the system; or
- Has discretion over the finances of the system.

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

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

“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 and/or industrial water system that begins at the public water system point of delivery; that is, at the immediate downstream side of the water meter, and is located on the consumer’s premises. The consumer’s water system includes all auxiliary sources of supply, storage, treatment, and distribution facilities, piping, plumbing, and fixtures under the control of the consumer.

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

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

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

“Cross-connection control specialist (CCS)” means a person holding a valid Washington State Cross-Connection Control Specialist certificate issued in accordance with chapter 246-292 WAC.

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

“Department” means the Washington State Department of Health.

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

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

“District” shall mean the Mukilteo Water and Wastewater District.

“Flow-through fire protection system” means a fire sprinkler system that:

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

“General manager” shall mean the General Manager of the District. Any act in this procedure required or authorized by the General Manager may be done on his or her behalf by an authorized representative of the District.

“Health hazard” shall mean any condition, device, or practice in a water supply system and/or its operation that creates or may create, a danger to the health and well being of a customer.

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

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

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

“Local administrative authority” means the local official, board, department, or agency authorized to administer and enforce the provisions of the Uniform Plumbing Code as adopted under chapter 19.27 RCW (WAC 51-46-0603).

“Low health cross-connection hazard” means a cross-connection that could cause an impairment of 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 such potable waters for domestic use.

“Potable” means water suitable for drinking by the public.

“Premise 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 (at the point where the water purveyor no longer has legal jurisdiction and/or authority to control the water system) to isolate the consumer’s water system from the purveyor’s distribution system.

“Plumbing hazard” shall mean a cross-connection in a consumer’s potable water system that may permit backsiphonage in the event of a negative pressure in the supply line.

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

“Purchased source” means water a purveyor purchases from a public water system not under the control of the purveyor for distribution to the purveyor’s consumers.

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

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

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

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

“System hazard” shall mean a threat to the physical properties of the public or the consumer’s potable water system by a material not dangerous to health but aesthetically objectionable that would have a degrading effect on the quality of the potable water in the system.

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

“Used water” means water which has left the control of the purveyor.

“Water quality specialist” shall be that person employed by the District that is certified as a Washington State cross-connection control specialist and is qualified to administer the district cross-connection control program.

General Program References:

The District shall ensure that good engineering and public health protection practices are used in the administration of a cross-connection program. 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 administration:

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

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

The following methods of cross-connection control are considered minimum protection at the water service connection at the property line:

1. The public water supply to any premise listed under WAC 246-290-490(4)(b)(i)(ii)(iii)(Table 9) shall require an approved air gap separation or an approved reduced pressure backflow assembly installed immediately downstream of the domestic water service connection, prior to any branch connections.

2. The public water supply to any premise on which material dangerous to health or toxic substances are stored or handled, and which, in the assessment of the District CCS poses a potential high health cross-connection hazard to the public water system, shall require an approved air gap separation or an approved reduced pressure backflow assembly installed immediately downstream of the domestic water service connection, prior to any branch connections.

3. The public water supply to any premise where entry is restricted so that inspection for cross-connections cannot be made with sufficient frequency or at sufficient short notice to assure that cross-connections do not exist shall require an approved air gap separation or an approved reduced pressure backflow assembly installed immediately downstream of the domestic water service connection, prior to any branch connections.

4. The public water supply to any premise having a repeated history of cross-connections being established or re-established, shall require an approved air gap separation or an approved reduced pressure backflow assembly installed immediately downstream of the domestic water service connection, prior to any branch connections.

5. The public water supply to any premise which has an unapproved auxiliary 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, and with no known cross-connections, shall require an approved air gap separation or an approved reduced pressure backflow assembly installed immediately downstream of the domestic water service connection, prior to any branch connections.

6. The public water supply to any premise which has internal cross-connections that are not correctable or which has complex plumbing arrangements that make it impractical to ascertain whether or not cross-connections exist, shall require an approved air gap separation or an approved reduced pressure backflow assembly installed immediately downstream of the domestic water service connection, prior to any branch connections.

7. The public water supply to any premise which has a heat exchanger or a solar hot water system shall require a risk assessment inspection by the District CCS to determine the level of backflow protection that may be required to be installed immediately downstream of the domestic water service connection, prior to any branch connections.

8. The public water supply to a fire system which will contain any chemical additives, including food-grade additives, shall require an approved reduced air gap separation or reduced pressure detector assembly installed immediately downstream of the public water service connection, prior to any branch connections.

9. The public water supply to a fire system with no chemical additives shall require an approved double check valve assembly or double check detector assembly installed immediately downstream of the public water service connection, prior to any branch connections.

10. The public water supply to any premise which poses a high probability of changes in the use of water by tenants, such as, but not limited to, shopping malls or strip malls, shall require an approved double check valve assembly installed immediately downstream of the domestic water service connection, prior to any branch connections.

11. The public water supply to any premise where cross-connections are unavoidable or not correctable, such as, but not limited to, tall buildings (over 30 feet), or water booster pump systems, shall require an approved double check valve assembly installed immediately downstream of the water service connection, prior to any branch connections.

12. The District in its sole discretion may allow the property owner to install a backflow preventer at an alternate location down stream of the water meter, provided that the property owner enters into an agreement with the District in the form attached hereto and incorporated by reference herein.

Coordination and delineation of responsibilities with local administrative authorities:

The control of cross-connections requires cooperation between the water purveyor, the local administrative authority, the health officer and the consumer.

- WAC 246-290-490(1)(d): The purveyor's responsibility for cross-connection control shall begin at the water supply source, include all the public water treatment, storage, and distribution facilities, and end at the point of delivery to the consumer's water system, which begins at the downstream end of the service connection or water meter located on the public right-of-way or utility-held easement.
- WAC 246-290-490(1)(e): Under the provisions of 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-connections within the consumer's water system, i.e., within the property lines of the consumer's premises, falls under the jurisdiction of the local administrative authority.
- WAC 246-290-490(2)(d): The purveyor shall coordinate with the local administrative authority in all matters concerning cross-connection control. The purveyor shall document and describe such coordination, including delineation of responsibilities, in the written cross-connection control program required in (e) of this subsection.

The District CCS shall make available to all local administrative agencies the information maintained in the district cross-connection control program files upon request, which may include, but is not limited to: (1) a master list of all premises that have been isolated from the district water system in accordance with the district cross-connection control program; (2) information concerning any internal cross-connections that come to the attention of the district CCS during risk assessment evaluations of premises; and (3) notification of any termination of water service for failure to comply with the requirements of WAC 246-290-490, District Resolution Number A-1456, and/or the Mukilteo Water and Wastewater District Cross-Connection Control Program.

Risk Assessment Survey:

A risk assessment survey for cross-connections and sanitary hazards requires a water use evaluation of new and existing buildings, structures, and grounds. The systematic evaluation shall be prioritized by risk to public health and shall be conducted as outlined below:

1. Upon application for a water service connection, the property owner (applicant) shall complete an application for district water service and a water usage questionnaire, which shall be reviewed by the District CCS. The District CCS shall make a determination of the risk posed to the public water system by the property owner's water system. The District CCS shall classify the water service connection as either a high health hazard or a low health hazard cross-connection, and shall specify the need and identify the type of backflow protection required (if applicable) for premise isolation backflow protection. When deemed necessary, the District CCS shall require a detailed plan and specification for the plumbing installation in order to facilitate risk-assessment review of the water use at the property.
2. The District CCS shall review all water system related plans and specifications to assess the following:
 - The actual or potential health hazard or contamination risk to the public water system
 - The complexity of any existing and/or proposed water piping system
 - The probability of occurrence of cross-connections within a property owner's water system
 - The determination of what cross-connections might constitute acceptable risks
 - The determination of the reliability required of any backflow prevention assembly utilized within a facility or mandated for premise isolation
 - The actual or potential use and/or availability of any unapproved auxiliary water supply systems
 - The storage and handling of material dangerous to health or toxic substances which, if introduced into the water system, would constitute a system, plumbing, or health hazard.

If, upon review, it is determined that any of these conditions will exist, the District CCS will advise the property owner in writing that such cross-connections exist. If the District CCS determines that the property owner's water system represents a potential health hazard risk to the district water system, such as, but not limited to, WAC 246-290-490(4)(b)(Table 9) facilities and/or systems, an approved backflow prevention assembly commensurate with the assessed degree of hazard shall be required for premise isolation at the water service connection, notwithstanding any point of hazard, point of use, or fixture protection existing within the property lines of the premises.

During the construction phase of any new building, structure, or ground installation, a District cross-connection control specialist (District CCS) shall perform the required premise isolation cross-connection control inspection. Upon completing of the inspection, but prior to the establishment of a water service connection, the District CCS shall advise the property owner/authorized agent, that subject cross-connection control inspection has been made and advise if any additional backflow protection is required. The District CCS shall advise the property owner/authorized agent that it is the property owner's responsibility to have a Washington State certified backflow assembly tester (BAT) test the backflow assembly prior to use of the water service, and that annual testing is required thereafter.

Backflow protection for single family residences:

In premises backflow preventers may be utilized in accordance with WAC 246-290-490 Sections (2)(h) & (4)(c)(i)(ii).

Existing Buildings, Structures, and Grounds:

The District's previous cross-connection control program relied on fixture isolation by approved backflow prevention devices to protect the District's system. The District shall continue to require annual testing of those devices until the property is eventually isolated from the District's distribution system by an approved backflow prevention device.

The District CCS will evaluate all high health hazard premises, all commercial and/or industrial premises, all premises with fire systems, all premises with water systems using booster pumps, and all premises with buildings 30' or more in height to insure premise isolation protection has been provided at the water service connection. Premises to be evaluated will be selected in order from an established list prioritized by expected degree of health hazard and/or risk of contamination. Premises not on the established priority list that come to the attention of the District CCS, and upon evaluation are determined deficient in required premise isolation backflow protection, shall be brought into current compliance without regard to any established priority list. Inspections of residential properties will not be routinely conducted unless those properties pose a potential health hazard risk to the district water supply, and for any reason, come to the attention of the District CCS.

The initial evaluation shall proceed according to the following steps:

1. A priority list shall be established using existing water service records, telephone directory yellow page listings, and other resources as beneficial.
2. Beginning with the highest rated health hazard on the program's priority list, the District CCS will make a risk assessment evaluation of each

property for actual or potential cross-connections and/or any conditions that might tend to contaminate the district water system.

3. Upon completion of the risk assessment evaluation, the District CCS will determine whether or not premise isolation backflow protection will be required, and will determine the level of protection required commensurate with the assessed degree of hazard.
4. The District CCS will prepare a written report to the file system that will include, but is not limited to, the following:
 - a. A list of all cross-connections found, their location, and any optional methods of elimination or control.
 - b. Any applicable drawings, sketches, blueprints, or photos.
 - c. A summary of the findings, recommendations and requirements for corrective actions, and a time (normally a maximum of 90 days) in which the corrective action must be completed.
5. The District CCS shall notify the property owner/authorized agent, in writing, of the District's requirement for premise isolation backflow protection. The code enforcement letter shall include the requirements for corrective actions and a corrective action completion date. One copy of the completed letter shall reside in the District cross-connection control program jacket file for the facility.
6. On the corrective action completion date, the District CCS shall contact the property owner/authorized agent and ask if the corrective actions have been completed. If the corrective actions have been completed, the District CCS shall inspect each required premise isolation backflow assembly located at the District water service connections to the property. If the corrective actions are in progress but more time is required for completion, a new completion date may be set by the District CCS. If corrective actions have been disregarded, the District shall take appropriate corrective action within its authority, per WAC 246-290-490(2)(j)(i)(ii)(iii), District Resolution Number A-1456 and the District Cross-Connection Control Program, which may include, but is not limited to, denying or discontinuing water service to a consumer's premises until the cross-connection hazard is eliminated or controlled to the satisfaction of the District.
7. When all required actions have been completed, a copy of the completed required actions letter shall be placed in the cross-connection control file for the property, together with all copies of correspondence, notes, related documents and any completed backflow assembly test report forms.
8. Re-inspection of premise isolation for each premise found to be subject to this procedure shall be accomplished biannually, if possible, or more often

if the degree of hazard so indicates or whenever there is a change in the use of the premises.

Records and Reports:

Cross-Connection Control Program File System:

1. A separate jacket file shall be established by the District CCS, for each individual customer that requires the installation of a premise isolation backflow prevention assembly. A computer software database will be utilized for compiling and extracting information required for tracking compliance as well as Department of Health annual summary reporting.
2. The following information shall be maintained in each individual jacket file:
 - a. Copies of all correspondence with customer relative to cross-connection control
 - b. Copies of evaluation reports, complete with field drawings (if applicable)
 - c. Copies of all completed backflow assembly test report forms
 - d. Copies of all reports or correspondence pertaining to enforcement action, cross-connections, or backflow incidents.