

Cross-Connection Control for Small Community Water Systems

SWRCB Division of Drinking Water – Visalia District

Purpose of Cross-Connection Control Program: Water provided by a public water system may be contaminated via cross-connections within the distribution system. The purpose of the cross-connection control program is to reduce the hazard of contamination of the public water system by identifying actual and potential cross-connections and taking action to protect the system from these hazards. This is accomplished by installing backflow prevention assemblies where hazards are identified; or ensuring that water-using equipment on the premises is installed in accordance with plumbing code requirements and good practice.

What are cross-connections?

Cross-connections are actual and potential unprotected connections between a potable water system and any source or system containing unapproved water or a substance which is not safe. Examples of cross-connections include:

1. Improperly installed irrigation systems that may allow backsiphonage of stagnant, bacteriologically unsafe water into the piping system.
2. Improperly plumbed water-using devices such as hot-tubs, boilers or commercial dishwashers which may allow unsafe water back into the domestic piping system.
3. Irrigation systems served by an auxiliary source, such as a private well or creek. Such systems create a potential for major contamination of the public water system via interties with the domestic piping system.
4. Interconnections between the potable system and a non-potable system.

What the Regulations Require

Section 7584 of the California Code of Regulations requires that each public water system have a cross connection control program that includes these elements:

1. The adoption of operating rules or ordinances to implement the cross-connection program.
2. The conducting of surveys to identify water user premises where cross-connections are likely to occur.
3. The provisions of backflow protection by the water user at the user's connection or within the user's premises or both.
4. The provision of at least one person trained in cross-connection control to carry out the cross-connection program.
5. The establishment of a procedure or system for testing backflow preventers
6. The maintenance of records of locations, tests, and repairs of backflow preventers.

Getting Started

For small community water systems, the initial elements of the program consist of the following:

1. Adopting an ordinance or set of rules to implement the cross-connection control program. The ordinance or set of rules is important since it establishes the legal authority to carry out the program.
2. Conducting a system survey to identify actual and potential cross-connection hazards.
3. Ensuring that hazards are abated by the installation of backflow prevention assemblies at the meter, eliminating the hazard in conjunction with the owner of the property or providing internal cross-connection protection.

System Survey

The system survey consists of a preliminary survey and, if necessary, a more detailed second survey. For most small systems, the initial survey may consist of a questionnaire sent to each customer asking whether the customer has specific potential hazards. Documentation of the system survey is to be submitted to the Division. Attached is a summary form for documentation of the system survey.

Residential areas

Customers should be asked if any of the following are located on-site:

1. Auxiliary water supply (i.e. either a well or a creek pump) - backflow prevention device is mandatory.
2. Irrigation systems - backflow prevention device not required if system is installed in accordance with plumbing codes with appropriate vacuum breakers.
3. Swimming pool, hot tub or spa - backflow prevention device not required if system is installed in accordance with plumbing codes.
4. Solar hot water heating panels - backflow prevention device not required if system is installed in accordance with plumbing codes.
5. Graywater systems - backflow prevention assemblies may not be required if the system is installed in accordance with the Uniform Plumbing Code.

If these or other potential hazards are located on site, the water system is to determine whether the equipment has been installed in accordance with plumbing codes and/or good practice in order to minimize the risk of backflow.

Commercial customers: A more detailed questionnaire and survey is necessary. Small community systems, which also serve commercial customers, should contact the Division. A system survey of commercial users as specified in the Manual is to be performed. As an alternative, the system may decide to require backflow prevention assemblies at all commercial service connections where hazards are likely to exist.

Wastewater and Hazardous Wastes: A service connection which handles wastewater or dangerous chemicals requires special evaluation and protection from cross-connection hazards. For additional information on evaluating this type of facility, please contact the appropriate regulatory agency and a cross-connection control specialist.

ELEMENTS OF A CROSS-CONNECTION CONTROL PROGRAM

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When implementing a Cross-Connection Control Program, the water supplier or health agency should follow an organized plan. The following items should be included as a minimum. The items **explain the Division's policy regarding the regulations.**

Section 7584. Responsibility and Scope of Program

The water supplier shall protect the public water supply from contamination by implementation of a cross-connection control program. The program, or any portion thereof, may be implemented directly by the water supplier or by means of a contract with the local health agency, or with another agency approved by the health agency. The water supplier's cross-connection control program shall for the purpose of addressing the requirements of Sections 7585 through 7605 include, but not limited to, the following elements:

(1) *The adoption of operating rules or ordinances to implement the cross-connection program.*

A public water supplier shall enact an ordinance or rule of service outlining the cross-connection control program and providing enforcement authority.

(2) *The conducting of surveys to identify water user premises where cross-connections are likely to occur.*

Water utilities do not have any responsibility for controlling or abating cross-connections on a user's premises. All existing facilities where potential cross-connections are suspected, however, shall be listed and inspected or reinspected on a priority basis, where feasible. All applications for new services or for enlarging existing services or changing of occupant shall be reviewed or screened for cross-connections hazards.

(3) *The provision of backflow protection by the water user at the user's connection or within the user's premises or both.*

Adequate provisions for implementation and enforcement of backflow protection where needed including the shutting off service when necessary.

(4) *The provision of at least one person trained in cross-connection control to carry out the cross-connection program.*

Specific units of the health agency and/or water supplier should be designated to organize and carry out the cross-connection control program. The personnel in those units should be trained as to the causes and hazards of unprotected cross-connections.

(5) *The establishment of a procedure or system for testing backflow preventers.*

A list of approved backflow preventers and list of certified testers should be made available to each water user required to provide backflow protection.

The list may include backflow devices approved by University of Southern California, Foundation for Cross-Connection Control and IAPMO, which may be found on the Division of Drinking Water's website at the following address:

http://www.waterboards.ca.gov/drinking_water/certlic/drinkingwater/Publications.shtml

The List of certified testers may be lists developed by the American Water Works Association and local county health agencies.

Backflow preventers should be tested at least yearly or more often as required by the health agency or water supplier.

(6) *The maintenance of records of locations, tests and repairs of backflow preventers*

Adequate records should be kept and filed for reference. These records should include, in addition to the name of the owner of the premises, the:

- a) Date of inspection
- b) Results of inspection
- c) Required protection
- d) List of all backflow preventer devices in the system
- e) Test and maintenance reports
- f) All correspondence between the water supplier, the local health authority, and the consumer
- g) Records must be maintained for a minimum of three years

Records of inspection and testing should be evaluated to determine if:

- a) Devices are frequently or sufficiently reviewed to detect failure.
- b) There are unusual feature of a particular model of device or component.
- c) Cause of failure can be eliminated.

A program should be established to notify the water user when his backflow preventer must be tested. (A minimum of once each year is required.) After installation or repair, a backflow preventer should be tested and approved before it is accepted.

Section 7605. Testing and Maintenance of Backflow Preventers

Regulations require the following regarding testing and maintenance of backflow prevention devices:

- (a) The water supplier shall assure that adequate maintenance and periodic testing are provided by the water user to ensure their proper operation.
- (b) Backflow preventers shall be tested by persons who have demonstrated their competency in testing of these devices to the water supplier or health agency.
- (c) Backflow preventers shall be tested at least annually or more frequently if determined to be necessary by the health agency or water supplier. When devices are found to be defective, they shall be repaired or replaced in accordance with the provisions of this Chapter.
- (d) Backflow preventers shall be tested immediately after they are installed, relocated or repaired and not placed in service unless they are functioning as required.
- (e) The water supplier shall notify the water user when testing of backflow preventers is needed. The notice shall contain the date when the test must be completed.
- (f) Reports of testing and maintenance shall be maintained by the water supplier for a minimum of three years.

GUIDELINES FOR CROSS-CONNECTION CONTROL FOR IRRIGATION SYSTEMS

Public water systems must be protected from actual and potential cross-connections between irrigation systems and domestic water systems. This is accomplished by ensuring that the irrigation system is installed in accordance with the requirements of the Uniform Plumbing Code with appropriate backflow prevention devices.

Special Conditions: For systems with an unapproved auxiliary source serving the irrigation system, additional protective action is necessary to guard against introduction of water from the auxiliary source into drinking water system. The following actions must be taken to guard against this hazard:

1. Identify all interties between the domestic system and the irrigation system.
2. Either disconnect these interties or install approved backflow prevention devices at each intertie. A Reduced Pressure Principle backflow prevention device is the type of device, which is to be installed.
3. Verify that there are no other interconnections between the domestic and irrigation systems. This is accomplished by draining the irrigation system and verifying that it does not refill with water from the domestic system through an undetected cross-connection. This procedure should be repeated on a period basis (once every three months).

Records: Maintain written records of dates of tests, procedures, results and corrective actions taken.

Cross-Connection Survey Summary Form-Small Community Water Systems

Name of System _____ System Number _____

Description of Survey Procedures-How survey was conducted, (include copy of survey form):
 Person conducting survey (List name and qualifications):

Procedures for Residential Connections:

Procedures for Commercial Connections:

Total number of service connections _____ Number of service connections surveyed _____

Number of connections with auxiliary sources (i.e. wells or creek pumps) _____

Number of connections with other hazards _____

Total number of backflow prevention devices _____

Type of Hazard Identified(i.e. private well, grazing animals, etc)	Number of connections with hazard	Number of devices installed	Number where device not necessary

Describe follow-up for service connections that did not respond to the survey:

Long-term (Describe on-going cross-connection protection & testing of backflow prevention assemblies)

Submitted by (signature) _____ Date _____