



City of San Diego Water Department Customer Support Division

San Diego County Apartment Association

**Cross-Connections Control
Presentation**



Water Department Meter Field Services

Cross-Connection Terminology

• **Cross-Connection** A cross-connection, as defined by the Cross-Connection Control Committee of the Pacific Northwest Section of the American Water Works Association (AWWA), is "Any actual or potential physical connection between a potable water line and any pipe, vessel, or machine containing a non-potable fluid or has the possibility of containing a non-potable fluid, solid or gas, such that it is possible for the non-potable fluid, solid or gas to enter the potable water system by backflow."

Lawn irrigation systems, swimming pools and hot tubs are common cross-connection points. When the sprinklers on irrigation systems are nested underground, it is possible for contaminated water to flow into the sprinklers. In swimming pools and hot tubs, if water inlets (the points where water flows into the pool or tub) are submerged, it is a cross-connection. This often occurs in hot tubs with submerged inlets that are made of permanent hard piping.



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Cross-Connection Terminology

Drinking water normally flows in one direction

- **Backsiphonage** is caused by a negative or reduced pressure in the supply line to a facility or plumbing fixture. *Backsiphonage* may be caused by an open fire hydrant, water main breaks and water system maintenance.
- **Backpressure** occurs when a drinking water system is connected to another system operating at a higher pressure. *Backpressure* may be caused by auxiliary water pumps, boilers, and/or elevated buildings.

When **Backflow** occurs, water runs *backwards* through your pipes and into the drinking water system. When this happens the water flowing backwards could contain something that might contaminate the drinking water supply.



Water Department Meter Field Services

Cross-Connection

- The City of San Diego strives to maintain positive pressure in the system at all times.
- Events such as main breaks and fire fighting can contribute to backflow conditions.
- The Cross-Connection Program seeks to eliminate or protect all cross-connections in the public water system and help customers comply with backflow prevention practices and regulation.



Water Department Meter Field Services

Mandating Authority

- There are several Mandating Authorities regarding Cross-Connections and Backflow Prevention.
- The City of San Diego has developed Water Department “Department Instructions” utilizing these mandates, we have had an active program since the 1970’s.
- Our programs address “Meter Protection” to protect the drinking water supplies we all use.
- Internal protection issues are not part of our program.
- The Federal Safe Drinking Water Act of 1974 provides jurisdiction over the public health aspects of the drinking water supply.
- State of California Water Code, Chapter 1, Section 110, Chapter 8, Section 500 and Chapter 723, Sections 13533, 13554.2 and 13554.3.
- California Code of California Regulations (CCR), Title 17 and Title 22.
- City of San Diego Municipal Code (SDMC), Chapter IV, Article 4, Section 44.0114 and Chapter VI, Article 7, Section 67.0202.



Water Department Meter Field Services

Cross-Connection Control Programs

- There are three areas to our program, with protection of the City's water system from potential contaminants our primary goal:
 - Private Backflow Testing Program
 - City Maintained Backflow Testing and Repair Program
 - Cross-Connection Survey and Installation Program



Water Department Meter Field Services

Cross-Connection Control Programs

- Private Backflow Testing Program
 - Over 18,000 backflow devices in the program that require notification and tracking of their required annual testing;
 - Mandated program by the State of California Department of Health Services;
 - Enforcement coordination with the Code Compliance group for owners in violation, this includes termination of water service if necessary;
 - Data entry and database management of these private accounts;
 - Regular reporting of program status to California Department of Health Services.



Water Department Meter Field Services

Cross-Connection Control Programs

- City Maintained Backflow testing and repair program
 - Annual backflow testing and repair program for over 2,000 devices;
 - Most devices are for city facilities, private devices are being phased out and moved to the private program;
 - Mandated program by the State of California Department of Health Services;
 - Regular reporting of program status to California Department of Health Services;
 - Supported by maintenance fees charged on users water bills.



Water Department Meter Field Services

Cross-Connection Control Programs

- Cross-Connection Program
 - Ongoing determination on all meter accounts for cross-connection potential, working with Development Services to assure all new installations and tenant improvements are addressed.
 - As the result of a Compliance Order from the State of California we are completing retroactive determinations on all meter accounts for backflow needs.
 - **Multi-Family, Commercial, Industrial, and Irrigation accounts are affected.** With the increase in irrigation systems, complex piping, circulation pumps, fire sprinkler systems, pools and laundry facilities, the prospects of contamination grow greater.
 - Notify and educate customers on the needs for system protection when backflow devices are required and work with them on installation options.
 - Devices installed are then tracked in the annual private testing program.
 - Mandated program by the State of California Department of Health Services with regular reporting of program status to California Department of Health Services.



Water Department Meter Field Services

Cross-Connection Control Program

Installation Notification Process

- Development Services looks at all Tenant Improvement Permits and New Installation request for Backflow requirements
 - If a backflow is required it is made part of the permitting process.
- A retroactive program is in place to look at existing meter connections for the need of backflow protection
 - If it is determined a backflow is needed, an installation letter is sent out.
 - The Water Department will work with the owner to educate them on the requirements and go over location possibilities and installation dates.

Water Department Meter Field Services

Cross-Connection Control Program

Annual Testing

- All devices must be tested annually, devices are assigned a set annual testing due date.
- A first notice is sent out approximately 45 days before the annual due date.
- A reminder letter is sent out approximately 15 days before the due date.
- If the due date passes without a response, we verify ownership and mailing address information and start the process over if the info has changed.
- If there is still no compliance a “Final” notice is sent out.
- With no response, the case is turned over to the Code Compliance Section. Personnel there make further attempts to make contact with the owners and to get the test completed. If there is still no compliance there can be a termination of water service



Water Department Meter Field Services

Cross-Connection Program Statistics

- There are over 270,000 Water Meters/Fire Services within the city of San Diego.
- Over 21,000 Water Meters/Fire Services have backflow devices that are tested annually.
- The Cross-Connection Program has mailed out over 21,000 first notices, over 12,000 second notices and over 4,500 final notices in the last year.
- At any given time Code Compliance is working with approximately 500 to 1,000 facilities to get them in compliance on their annual testing.
- Over 3,000 new devices have been installed in the last year.
- Approximately 500 new installation notices are sent out per month.



Water Department Meter Field Services

Cross-Connection Control Questions

Here are some answers to commonly asked questions about the Water Department's Cross-Connection and Backflow Prevention Programs:

- **How can I help prevent a dangerous backflow situation?**

You can help by working with the City of San Diego Water Department's Cross-Connection Control Program. Our Program, which is required by the State Department of Health Services Drinking Water Program, is a combined effort between the City's Development Services and our cross-connection inspectors. It includes the elimination or protection of all cross-connections by approved methods or the protecting of the municipal drinking water system by the installation of approved backflow prevention assemblies when a potential hazard is found

- **Who is on the City of San Diego's Tester List ?**

The list consist of individuals certified by the AWWA or ABPA to be a backflow tester, there is no fee to be on our list and anyone with these certifications can fill out a simple application to be include on our list. A list of approved testers is available on the Water Department website at www.sandiego.gov/water/gen-info/ccbackflow.shtml



Water Department Meter Field Services

Cross-Connection Control Questions

• **Do backflow incidents really happen?**

Yes! Here are just three examples:

- **Worms from Irrigation System.** Residents found parasitical worms (nematodes) in their water after the atmospheric pressure breaker malfunctioned on a privately owned underground sprinkler system. During a water pressure drop, the vacuum in the system sucked some water from the sprinkler into the city water. The homeowner found worms swimming in the bathtub while filling it to bathe his child.
- **Insecticide from Garden Hose.** The highly toxic insecticide chlordane was back-siphoned into the water system. An extermination company employee had left one end of a garden hose in a barrel of diluted insecticide and the other connected to an external home hose bibb (outside spigot). When the water supply system pressure dropped due to repair work, the chlordane was sucked back through the house into the water system.
- A resident called in to complain that the tap water was pink, after an estimated 2,000 gallons of **water mixed with car wax** got into the city's drinking-water supply. City staff traced the problem to a car wash. The facility had been using a pressure washer to clean out pipes as part of maintenance work on its plumbing.



Water Department Meter Field Services

Cross-Connection Control Questions

- **Why do I have to install a backflow prevention assembly?**

To protect the customers of public water providers, the Environmental Protection Agency Safe Drinking Water Act, State Department of Health Services, City of San Diego Water Department and Uniform Plumbing Code each require all potential cross-connections be equipped with a backflow prevention assembly. Therefore, the City of San Diego Water Department has adopted codes that regulate cross-connections.

- **What is a backflow assembly?**

Backflow assemblies are devices designed to prevent water from flowing back into the public water system.

- **Where do I install this device?**

It must be installed as close as practical to the water meter, as approved by the Water Department. This helps eliminate the chances of an illegal connection being made between the meter and backflow device.



Water Department Meter Field Services

Cross-Connection Control Questions

- **Does my backflow assembly need to be tested?**

Yes. The City of San Diego Water Department requires that that an approved tester check all backflow assemblies at the time of installation, annually after installation, after repairs and after relocating. Backflow assembly testers are private contractors who must submit a report to the Water Department following the test. A list of approved testers is available on the Water Department website at www.sandiego.gov/water/gen-info/ccbackflow.shtml

- **What happens if I do not test a backflow assembly that I have received a notification to test?**

If for some reason you do not test your backflow assembly your account will be given to the Code Compliance Section for non-compliance. Also, your water service may be terminated to protect the public water system.



Water Department Meter Field Services

Cross-Connection Control Questions

Where are the most common cross-connections found?

- Whenever a plumbing fixture is connected to the drinking water supply, a potential cross-connection exists. Fortunately, many of the plumbing fixtures have built-in backflow protection. Here are some examples of cross-connections that can lead to backflow are:
- Wash basins and service sinks
- Laboratory equipment
- Irrigation or lawn sprinkler systems
- Swimming pools and spas
- Solar heat systems
- Fire sprinkler systems
- Auxiliary water supplies (wells, storage tanks and second feeds)
- Photo developing equipment
- Chemical feed equipment
- Attachment to hoses to apply weed killer or fertilizer or to flush antifreeze
- Food and beverage processing equipment
- Ornamental fountains
- Boilers
- Hose bibs



Water Department Meter Field Services Backflow Picture and Examples





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Backflow Picture and Examples





Cross-Connection

**The business community
continues to do a great job in
protecting the public water
system.**



THE CITY OF
SAN DIEGO
+
CALIFORNIA

Water Department Customer Support Division

Questions



Water Department Meter Field Services

Cross-Connection Web Information

<http://www.sandiego.gov/water/gen-info/ccbackflow.shtml>

<http://abpa.org/> American Backflow Prevention association



Protecting our Drinking Water

Backflow Prevention and Cross-Connection Section

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