



**DEPARTMENT OF PUBLIC WORKS**  
**P.O. Drawer Q, Independence, CA 93526**  
**760-878-0201 Phone / 760-878-2001 Fax**

October 22, 2018

**Attention Inyo County Water Systems Customers of Laws, Independence, and Lone Pine:**

Este es un aviso importante. Si necesita ayuda para leer esto, busque ayuda.

**STATE WATER RESOURCES CONTROL BOARD REQUIRED CROSS CONNECTION CONTROL SURVEY OF WATER USE AT ALL RESIDENTIAL AND NON-RESIDENTIAL PREMESIS**

The state mandates that a water use survey on your premises shall be performed to determine if cross connections are present and if harmful backflow pollution or contamination to the public water supply is likely. Cross connections are actual or potential plumbing arrangements between potable water pipes and any other piping or sources of used water or other liquids. Illustrations of cross connections are included.

What is backflow? Backflow is the unanticipated undesirable reversal of water through your plumbing due to either backpressure from your premises or from back siphoning due to system loss of pressure from our water system. Backflow can cause 1 of 2 things: a) water pollution causing aesthetic concerns, but not health problems, or b) water contamination causing sickness or even death. Backflow occurs if both a) cross connections are present in your plumbing, and b) either a low pressure event on our side, or overpressure on your side occurs.

Information is included showing typical cross connections and associated possible backflow events and explaining their remedies, especially in residential settings. Typical water-using equipment creating inherent cross connections that may require backflow protection are listed. The minimum cases of water use requiring backflow protection, and the minimum level of backflow protection required are excerpted from California Code of Regulations Title 17, Table 1. Water uses we observe during a survey not listed in Table 1 will be evaluated on a case by case basis and the protection you need to provide, if necessary, will be determined by the Director of Public Works.

The mandated water use survey will initially be performed by you filling out a form which has been included for both residential and non-residential customers that must be filled out & returned to us by November 12, 2018. You may put the completed form in the mail slot at the Lone Pine Airport, drop it off at the Public Works office in Independence, fax it to the number above, mail your form to the address at the top of this letter, or call in the information. Blank forms are available at [www.inyocounty.us/](http://www.inyocounty.us/). We understand you may own a business and have a residence and therefore will need to fill out a form for each water service. We can send you a copy of the forms if necessary.

This survey form may be the basis for an in-person survey conducted by the county's Cross Connection Control Specialist. After we review your survey form, if an appointment is necessary, we will contact you. Please insure your contact information is accurate.

California Code of Regulations Title 17 Section 7584 and 7585 (<https://govt.westlaw.com/calregs/Search/Index>) and Inyo County Code Title 4 (<http://www.qcode.us/codes/inyocounty/>) by law allow surveys, entry onto your premises to determine conditions detrimental to water service, required backflow equipment by you, protection of the water supply, service check valves, and termination of your water service, which we do not expect.

We thank you in advance for your understanding & timely cooperation. Together we can help keep your drinking water safe, and safe for all others. Call Keith Pearce, Associate Engineer-Water at (760) 878-0210, or email him at [kpearce@inyocounty.us](mailto:kpearce@inyocounty.us) with any questions or comments.

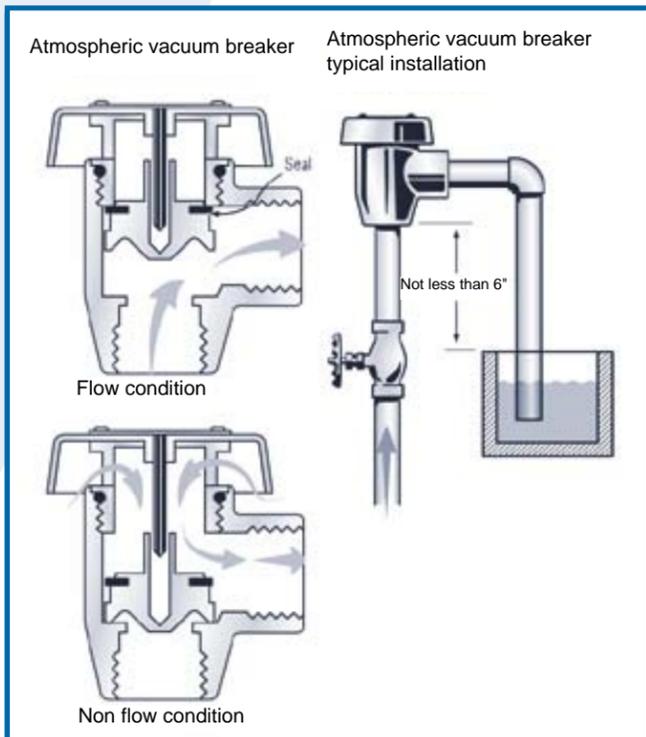


# Tech Brief

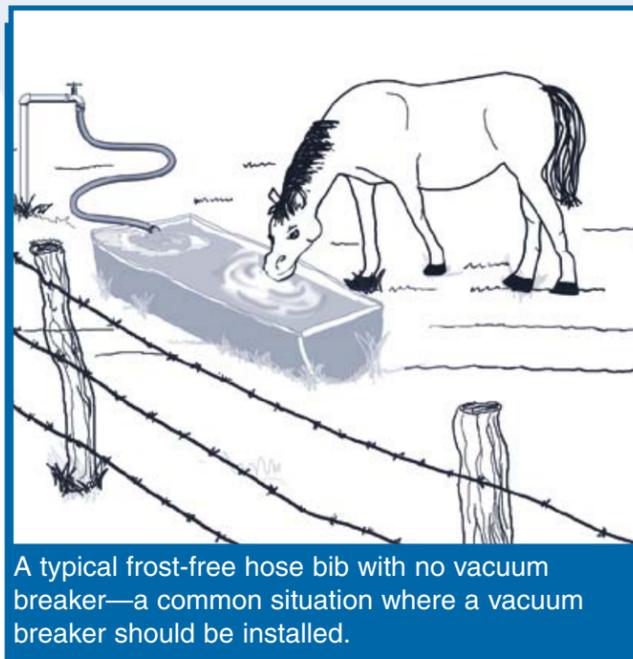
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## Cross Connection and Backflow Prevention

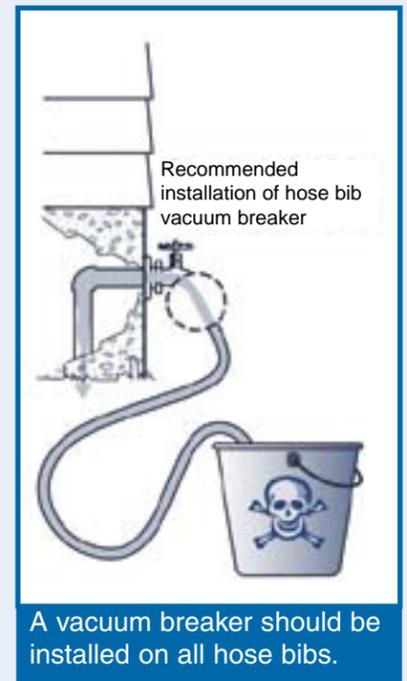
By Zane Satterfield, P. E., NESC Engineering Scientist



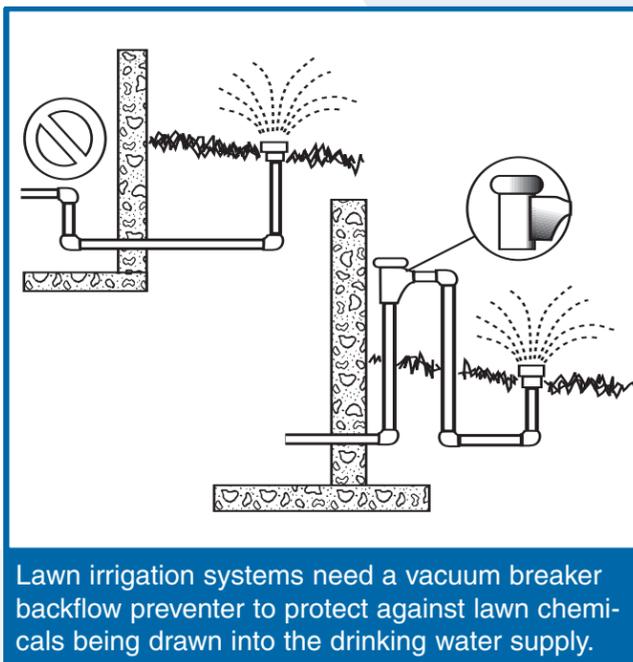
A properly installed vacuum breaker (atmospheric vacuum breaker) provides excellent protection against backsiphonage. For example, if the flow in the pipe is stopped, a vacuum breaker valve drops down, closes the water supply entry, opens an air vent, and prevents contaminants from being siphoned into the water supply. Vacuum breakers do not protect against backpressure.



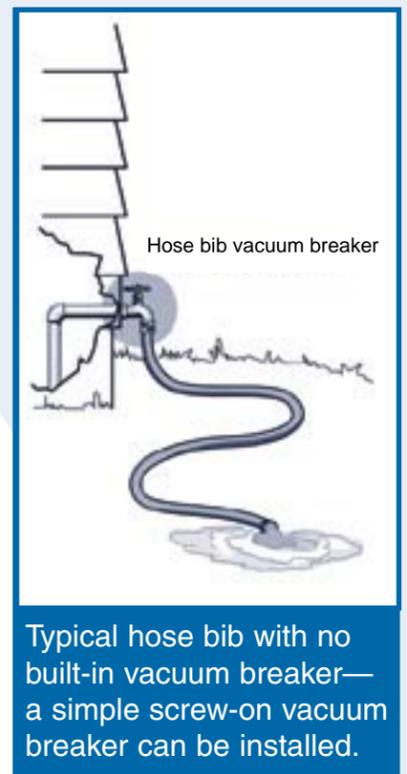
A typical frost-free hose bib with no vacuum breaker—a common situation where a vacuum breaker should be installed.



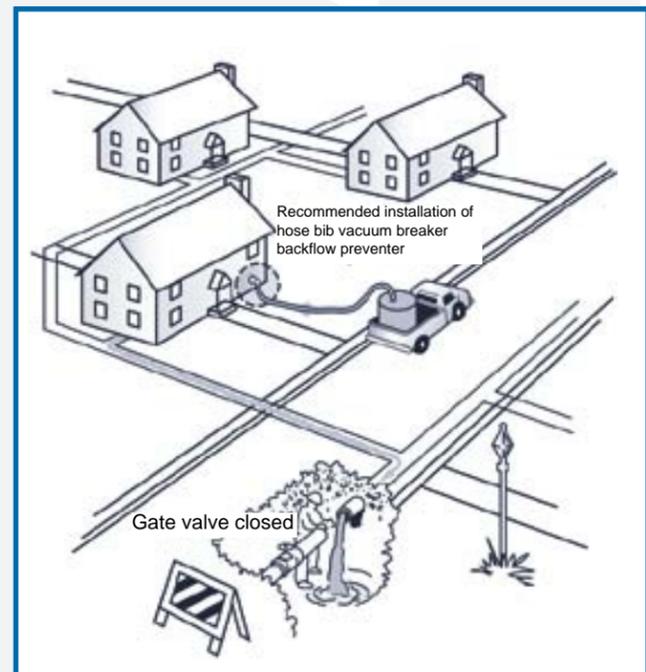
A vacuum breaker should be installed on all hose bibs.



Lawn irrigation systems need a vacuum breaker backflow preventer to protect against lawn chemicals being drawn into the drinking water supply.



Typical hose bib with no built-in vacuum breaker—a simple screw-on vacuum breaker can be installed.



In most circumstances, homeowners should install a hose bib vacuum breaker backflow preventer. A hose bib, also called a bibcock or sillcock, is typically used to provide hose connections outside of buildings. The downstream side of the valve (faucet) is threaded to match standard garden hoses. A typical situation that could cause backsiphonage is when a break occurs in a waterline that requires workers to shut off valves in the surrounding area to make repairs. Water can then drain out of the lines and siphon contaminants into the water supply.

### References:

Bhardwaj, Vipin. 2004. "Tech Brief: Cross Connection and Backflow Prevention," *On Tap*. National Drinking Water Clearinghouse: Morgantown, WV.

U.S. Environmental Protection Agency. 2003. *Cross-Connection Control Manual*. Washington DC: EPA (Available as a product from NDWC, item #DWBKDM03)

Resort Municipality of Whistler, <http://www.whistler.ca/content/view/237/>

Watts Water Technologies, Inc. Canada. 2006. *Backflow Prevention/Learn About. Educational Resources to Keep You Informed*. [www.wattscanada.ca/pro/divisions/backflowprevention/learnabout/learnabout\\_usc.asp](http://www.wattscanada.ca/pro/divisions/backflowprevention/learnabout/learnabout_usc.asp). Accessed on May 22, 2007.

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[http://en.wikipedia.org/wiki/Double\\_check\\_valve](http://en.wikipedia.org/wiki/Double_check_valve). Accessed on November 27, 2007.

The Source About Air. 2007. A Quick Word About Air Gaps. [www.airgap.com/about\\_airgaps.htm](http://www.airgap.com/about_airgaps.htm). Accessed on November 27, 2007.



A typical screw-on vacuum breaker for a hose bib.



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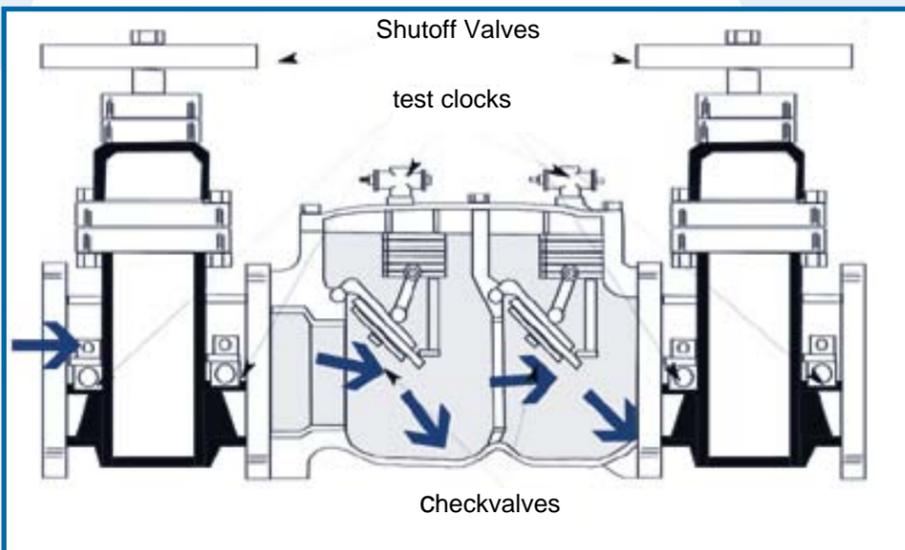
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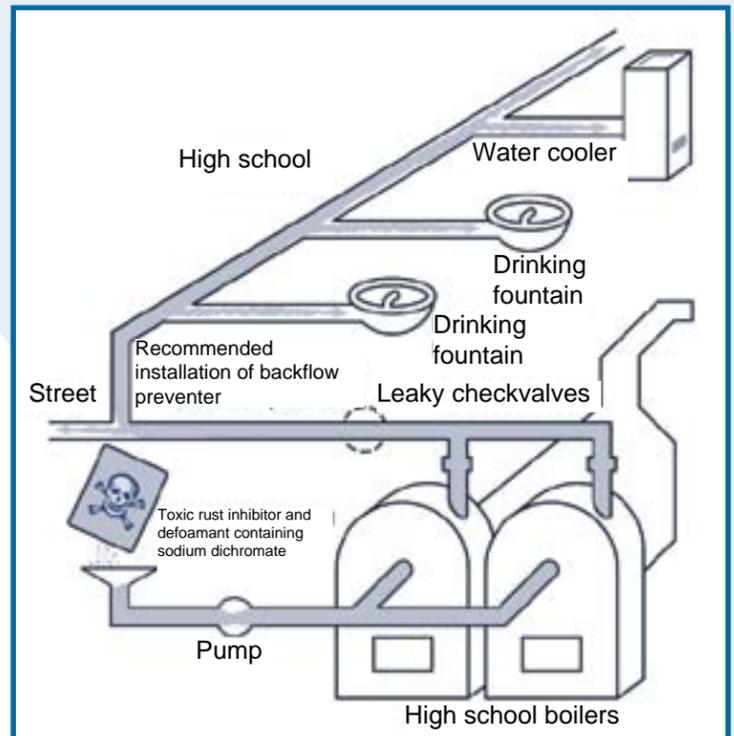
## Cross Connection and Backflow Prevention

By **Zane Satterfield, P. E.**, NESC Engineering Scientist

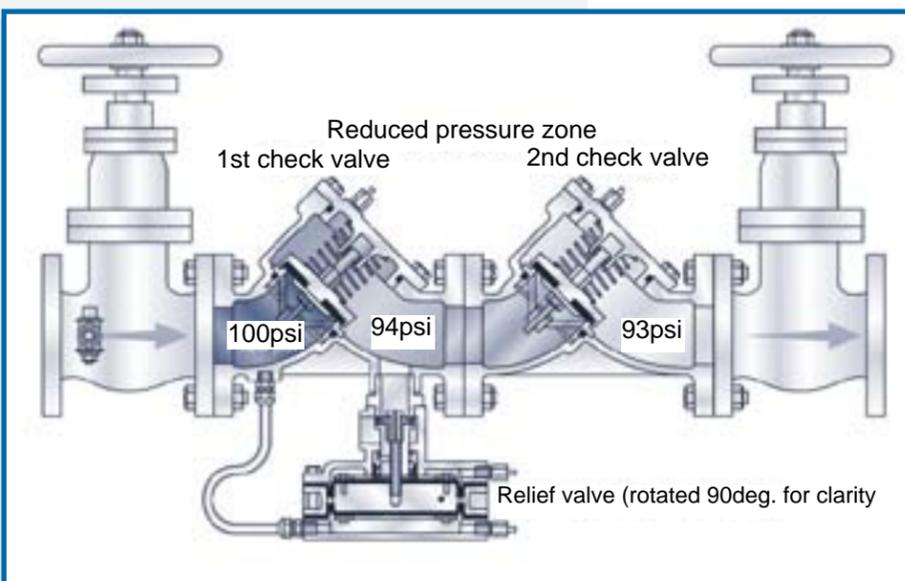
Plumbing cross connections can link a potable water supply to a contamination source, causing a serious public health hazard. Cross connections can be controlled, but it takes vigilance and knowledge to carry out a good cross-connection control program. This poster illustrates some mechanical devices and methods used to control cross connections in commercial and industrial applications as well as for homeowners.



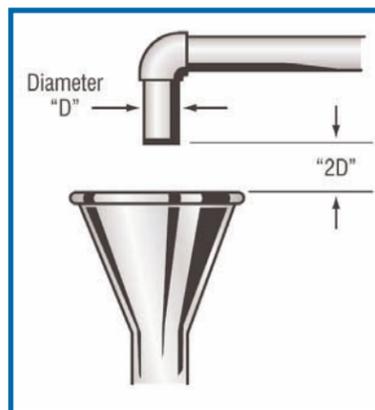
A double check valve or double check assembly consists of two check valves assembled in series usually with a ball valve or gate valve installed at each end for isolation and testing. Test cocks (very small ball valves) are in place to attach test equipment for evaluating whether the double check assembly is still functional (in most states it is important to have the test cocks to be approved backflow devices).



This is a typical situation in public buildings where prevention devices like RBP should be used.



A reduced pressure zone backflow preventer (RBP) has two spring check valves with a pressure-relief valve located between them that can be vented to the atmosphere.



An air gap is the most effective way to prevent cross connection and backflow. An air gap can be thought of as a no-fail check valve that doesn't have an internal seat or any moving parts. However, air gaps are not possible for all situations. Therefore, other devices to prevent backflow and backsiphonage must be available.



NESC Engineering Scientist **Zane Satterfield** is a licensed professional engineer and previously worked for the West Virginia Bureau of Public Health, Environmental Engineering Division.

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**Water Use Survey Questionnaire Residential Customers**  
*(Non-Residential other side)*

**Customer Account Number:** \_\_\_\_\_

**Customer Name:** \_\_\_\_\_

**Address Line 1:** \_\_\_\_\_

**Address Line 2:** \_\_\_\_\_

Please indicate whether the special plumbing or activities listed below apply to your premises:

Yes	No	Plumbing or Activity Present on Customer's Premises
		Underground sprinkler system
		Water treatment (e.g., water softener, iron/manganese/rust filter)
		Solar heating systems
		Residential fire sprinkler system with or without chemicals
		Water well or rainwater collection system, etc
		Sewage reclamation or grey water system for irrigation
		Any plumbing work since January 1, 2017
		Hobby farm
		Animal watering troughs
		Swimming pool, spa, or jacuzzi
		Greenhouse or decorative pond, seasonal / perennial creeks or canals
		Water storage tanks for any purpose
		Photo lab or dark room
		Swamp coolers
		Surface water distribution collection box or septic tank
		Home-based business. If Yes, list type/describe (e.g., beauty salon, machine shop, etc.): _____ _____ _____

Backflow Preventer on-site: Manufacturer, type, size, model #, serial#

\_\_\_\_\_

Completed by (print name): \_\_\_\_\_

Date: \_\_\_\_\_

Resident's Signature: \_\_\_\_\_

Phone Number: \_\_\_\_\_

**Please return completed form by November 12, 2018 and send to: Attention Keith Pearce, PO Drawer Q, Independence, CA 93526 Thank You!**

## Water Use Survey Questionnaire Non-Residential Customers (Residential other side)

Name of Customer or Business: \_\_\_\_\_

Address: \_\_\_\_\_

Address: \_\_\_\_\_

Phone Number: \_\_\_\_\_

Description of Business: \_\_\_\_\_

Is your business or premises of a type included in the table below (check all that apply)?

Agricultural (farm or dairy), water tanks, seasonal / perennial water creek / canal		Any plumbing work since January 1, 2017	
Beverage bottling plant		Mortuary	
Car wash		Petroleum product sales or storage	
Church- baptismsals		Solar water heating panels on-site	
Commercial laundry or dry-cleaners, water treatment of any kind		Automotive garage or repair facility (parts washers, chemical storage, etc)	
Having both grey water or water well and potable water on-site		Survey access denied or restricted by customer	
Film processing facility, water softener, iron/manganese/rust filter		Surface water distribution collection box or septic tank	
Food handling facility or restaraunt		Wastewater facilities of any kind	
Hospital, medical center, nursing home, veterinary, medical, or dental clinic, or blood plasma center		Having an auxiliary water supply: tanks, wells, creeks, canals, etc	
Having separate irrigation system using purveyor's water and adding chemicals*		Having materials on-site requiring an SDS sheet or MSDS sheet for employee safety	

\*e.g., parks, playgrounds, golf courses, cemeteries, estates, etc.

Other potential cross-connection concerns:

Irrigation system, lawn sprinklers, bubblers, greenhouse

Fire sprinkler system / tank,  using  not using chemicals or anti-freeze

Swimming pool, spa, jacuzzi

Presence of Backflow Preventer: Manufacturer, type, size, model #, serial # \_\_\_\_\_

**Note to Customer:** This form is used for preliminary assessment only. County of Inyo may require a more thorough assessment at a later date.

This form was completed by (print name): \_\_\_\_\_ Date: \_\_\_\_\_

**Please return completed form by November 12, 2018 and send to: Attention Keith Pearce,  
PO Drawer Q, Independence, CA 93526 Thank You!**

**TABLE 1  
TYPE OF BACKFLOW PROTECTION REQUIRED**

Degree of Hazard	Minimum Type of Backflow Prevention
<b>(a) Sewage and Hazardous Substances</b>	
(1) Premises where there are waste water pumping and/or treatment plants and there is no interconnection with the potable water system. This does not include a single-family residence that has a sewage lift pump. A RP may be provided in lieu of an AG if approved by the health agency and water supplier.	AG
(2) Premises where hazardous substances are handled in any manner in which the substances may enter the potable water system. This does not include a single-family residence that has a sewage lift pump. A RP may be provided in lieu of an AG if approved by the health agency and water supplier.	AG
(3) Premises where there are irrigation systems into which fertilizers, herbicides, or pesticides are, or can be, injected.	RP
<b>(b) Auxiliary Water Supplies</b>	
(1) Premises where there is an unapproved auxiliary water supply which is interconnected with the public water system. A RP or DC may be provided in lieu of an AG if approved by the health agency and water supplier	AG
(2) Premises where there is an unapproved auxiliary water supply and there are no interconnections with the public water system. A DC may be provided in lieu of a RP if approved by the health agency and water supplier.	RP
<b>(c) Recycled water</b>	
(1) Premises where the public water system is used to supplement the recycled water supply.	AG
(2) Premises where recycled water is used, other than as allowed in paragraph (3), and there is no interconnection with the potable water system.	RP
(3) Residences using recycled water for landscape irrigation as part of an approved dual plumbed use area established pursuant to sections 60313 through 60316 unless the recycled water supplier obtains approval of the local public water supplier, or the State Water Resources Control Board if the water supplier is also the supplier of the recycled water, to utilize an alternative backflow protection plan that includes an annual inspection and annual shutdown test of the recycled water and potable water systems pursuant to subsection 60316(a).	DC
<b>(d) Fire Protection Systems</b>	
(1) Premises where the fire system is directly supplied from the public water system and there is an unapproved auxiliary water supply on or to the premises (not interconnected).	DC
(2) Premises where the fire system is supplied from the public water system and interconnected with an unapproved auxiliary water supply. A RP may be provided in lieu of an AG if approved by the health agency and water supplier.	AG
(3) Premises where the fire system is supplied from the public water system and where either elevated storage tanks or fire pumps which take suction from private reservoirs or tanks are used.	DC
(4) Premises where the fire system is supplied from the public water system and where recycled water is used in a separate piping system within the same building.	DC
<b>(e) Dockside Watering Points and Marine Facilities</b>	
(1) Pier hydrants for supplying water to vessels for any purpose.	RP
(2) Premises where there are marine facilities.	RP
<b>(f) Premises where entry is restricted</b> so that inspections for cross-connections cannot be made with sufficient frequency or at sufficiently short notice to assure that do not exist.	RP
<b>(g) Premises where there is a repeated history of cross-connections</b> being established or re-established.	RP

# Possible Plumbing Hazards

Water Wells

Storage Tanks

Special Uses Equipment

Requiring Water at all

Times

Water Connected

Heating/Cooling sys:

Air conditioners  
(Swamp Coolers)

Boilers

Chillers

Cold Storage

Cooling Towers

Heat Exchangers

Hydronic Heat

Refrigeration

Solar Panels

Water-Cooled

Equipment

Water Connected

Industrial Fluid/Pressure

Systems:

Booster Pumps

Circulating Pumps

Hydraulic Lines

Hydropneumatic (water  
& air pressure tank)

Systems

Priming Lines

Steam Lines

Water Connected

Chemical Injection/Feeder

Systems:

Corrosion/Scale

Inhibitors

Algae/Microorganism

Biocides

Soaps

Softeners

Irrigation systems:

Fertilizer Injection

Chemical Injection

Booster Pumps

Second water service

Connections

Laboratory Facilities

Kitchen Facilities:

Coffee Urns

Dishwasher

Double Boiler

Garbage Disposal

Grease Trap

Pressure Cooker

Steam Table

Laundry or Dry Cleaning  
Facilities

Ornamental Ponds or  
Fountains

Photo Processing/Printing  
Equipment

Plating Facilities

Reclaimed Water or  
Solvent use

Sewage Systems:

Pumps

Sump Ejectors

Water Connected

Unclogging Equipment

Trailer Flushing

Facility

Holding tanks

Flush Valve Toilets or

Urinals

Swimming Pool/Spa:

Chemical Additives

Low Level Fill Inlet

Tanks, Vats, or other

Vessels containing Non-

Potable Mats

Fire Protection Systems

Connected to Public Water

Haz Mats on Premises

Belowground Fire

Sprinkler Pipelines

Complex Piping  
systems

Unapproved Auxiliary

Water Supply

Elevated Storage Tanks

Private Reservoirs

Haz Mats in Fire

Systems

Interconnection with  
another Public Water

Service

Adapted from "Sacramento County  
Water Agency Water Service Request  
and Cross Connection Control  
Questionnaire"