

Backflow Importance

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Backflow Importance

Maintaining safe drinking water is vital to the overall well being of the human population. Water that is safe from contaminants is a fundamental basic human necessity. Clean water is required for proper hydration, sanitation, and basic health needs. The World's limited water supply requires that safe drinking water be maintained and protected. Potable treated water must be kept free from contaminants, and backflow prevention devices work to avert pollutants from reaching the human population. Backflow prevention is extremely important in safeguarding potable water supplies from various hazards to drinking water by providing education to the public, and utilizing various devices and practices that will ensure the safety of this precious resource.

Water utilities have to make sure that water provided to customers and the public is safe, and properly treated and tested as mandated by federal, state, and local laws. The Safe Drinking Water Act, signed into law in 1974, placed the responsibility on local and state governments for maintaining safe drinking water. Water utilities, as well as, federal, state, and local officials also have to be concerned about individual homeowners, businesses, factories, hospitals, and industry as a whole, so that they do not accidentally and unknowingly cause a reverse backflow of tap water from their home or businesses back into the water utilities mains and systems. Many times this reverse pressure flow or backflow may be connected to customer's hoses, tanks and/or equipment that contain non-potable substances. These are also referred to as cross connections. Backpressure through cross connections is a cause of backflow, or reverse flow, that flows back into the water utilities potable water mains and system. This cross connection backflow can easily pollute the potable water system, and can be certainly prevented through the proper use of back flow devices.

Health hazards to public and private water utilities as a result of backflow and cross connection incidents have come in many forms. There have been numerous instances of cross connection issues that have impacted public health. One of the earliest documented backflow incidents in the United States occurred in 1933 at the World's Fair in Chicago. Ninety-eight people died from an amoebic dysentery outbreak that was believed to be caused by a cross connection between the sewer system and the drinking water system of two of the Fair's hotels. In 1981, a nation fast food chain in Norfolk, Virginia, as well as, a ship repair facility contacted the local water authority to say that customers were complaining that many of the beverages tasted like salt. After an investigation, it was determined that a backflow preventer at the shipyard had frozen and burst earlier in the year. Instead of replacing the backflow preventer, the shipyard removed it and placed a straight pipe in its place, which allowed seawater through backpressure to enter the public water system. In Iowa, two million dollars worth of pork was contaminated when wastewater from an incorrect pipe was attached to a newly drilled well. Plant employees unknowingly rinsed the meat with contaminated water. Sewage water from the meat packing operations then entered the potable water line due to a cross-connection. In northern New Jersey, water to sixty-three homes was temporarily interrupted due to chemicals coming from a pest control company being back-siphoned into a water main. A construction crew that broke a water main nearby caused this incident. A North Carolina X-ray clinic experienced a strong chemical odor coming from their water supply. An investigation revealed that a garden hose from an outside facet used to supply water to an x-ray chemical mixer created an inadvertent cross-connection, that allowed chemicals to enter the drinking water. If a backflow device had been installed on the facet before the garden hose, this incident could have been avoided.

There are many types of devices and practices used today to prevent backflow and backpressure through cross-connections. Educating the public on the dangers of backflow prevention, and using proper backflow devices to prevent cross connection is paramount to a safe water supply. Several factors must be taken into consideration when selecting a backflow device, including local building codes regulating backflow preventers. The simplest and least expensive backflow preventer device is called a vacuum breaker (AVB) or anti-siphon valve. This device easily attaches to an outside facet connection and then garden hoses are attached to this device, which prevents backflow into the main water supply. There also AVB's for sprinkler and irrigation systems. The second backflow preventer device is called a pressure vacuum breaker assembly (PVB). PVB's are simple in design, and are easy to install. The third backflow preventer device type is known as a double check valve (DCV), which is where the potential for backpressure is present. The last major backflow preventer device is a reduced pressure zone assembly (RPZ). RPZ's are the most secure and reliable of all backflow prevention devices. They are also the most complicated and expensive backflow preventers because they protect against backpressure. The most crucial backflow protection would be the air gap. It is considered the highest level of protection against backflow. An air gap provides a separation between the opening and the water in the pipe. An air gap is the most common method of backflow protection. The water supply to most faucets and drinking fountains is protected against backflow by an air gap. Finally, educating the public, children, and people who work in the water, plumbing, and landscaping industries about the potential dangers of backflow will help ensure that our valuable water resource will be protected and kept safe for future generations.

A safe water supply is vital to the human race. Reverse flow from a water customer caused by backpressure can, has, and does compromise the safety of the public water systems.

Backflow and cross-connection accidents have occurred over the years, causing deaths, medical problems, loss of business, and water contamination. All backflow and cross-connection incidents can be prevented in the future by implementing proper educational programs about water supply safety, and requiring the use of proper devices to prevent cross contamination. Only through the use of various backflow devices and education can our drinking water supply remain free from contamination and safe for future generations.

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"I acknowledge the helpful guidance and support of my father, who was a former certified backflow tester."

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“I certify that this essay is my own work, and that any ideas from the work of other people, published or otherwise, are fully referenced.”

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EDUCATION:

[REDACTED] High School, Tucson, Arizona (2015-Present)

- Principal's Honor Roll with Distinction (2015-2018)
- GPA-4.13

WORK EXPERIENCE:

Camp Counselor- Chautauqua Institution Boy's and Girl's Club (June 2017-Present)

- Supervised and instructed many age groups
- Assisted children in various activities

Sunday School Assistant Teacher- Chautauqua Department of Religion (June 2013-Present)

- Planned lessons
- Supervised and taught children

AWARDS:

- National Honor Society (2017-2019)
- Advanced Placement National Scholar Award (2018)
- Southern Arizona Tennis Division III All-Star (2018)
- American Legion Auxiliary Girl's State Participant (2018)
- Congressional Young Women's Leadership Conference (2016)
- Athlete of the Month (2018)
- Optimist Club Oratorical Contest Club Level Winner (2017 and 2018)

LEADERSHIP:

- Student Body Secretary (2018-2019)
- Junior Class Vice President (2017-2018)
- Varsity Tennis (2015-2019) Captain (2017-2018)
- Mock Trial President (2018-2019) Treasurer (2017-2018)

VOLUNTEER EXPERIENCE:

- Member of Assistance League of Tucson Assisteens (2015-Present)
- Hundreds of hours of volunteer work in the Tucson community

FUTURE EDUCATION PLANS:

- Plan to attend a 4-year college