

### **What is a cross-connection?**

Any physical connection between a possible source of contamination and any drinking water system piping.

### **What is backflow?**

The flow through a cross-connection from a possible source of contamination back into the drinking water system.

### **Why should you be concerned?**

- **ALL** cross-connections pose a potential health risk. **Chemical burns, fires, explosions, poisonings, illness and death have all been caused by backflow through cross-connections.**
- Backflow can be a health hazard for your family or other consumers if contaminated water enters your water supply plumbing system and is used for drinking, cooking or bathing.
- Backflow occurs more often than you think.
- Cross-connections with water supply plumbing or public drinking water piping systems are prohibited by law.
- Protecting the public water system from backflow contamination is the law.
- You are responsible for protecting your water supply plumbing from backflow that may contaminate your drinking water and the drinking water of others. This includes complying with the plumbing code and not creating cross-connections.

### **Why does backflow occur?**

Backflow occurs when a cross-connection is created and a pressure reversal, either as backsiphonage or backpressure, occurs in the water supply piping.

### **What causes backsiphonage?**

Backsiphonage occurs when there is a loss of pressure in a piping system. This can occur if the water supply pressure is lost or falls to below the source of contamination. This condition allows liquids to be siphoned back into the distribution system, just like drinking from a glass with a drinking straw.

### **What causes backpressure?**

Backpressure occurs when an opposing pressure is applied against the public water system's supply pressure and the higher pressure overcomes the public water system's pressure. This condition allows undesirable gases or liquids from another system to enter into the drinking water supply. Any pumping system (such as a well pump) or pressurized system (such as steam or hot water boilers) can exert backpressure when cross-connected with the public water system.

### **What are some common backflow hazards that threaten the homeowner and other consumers?**

- Hose connections to chemical solution aspirators to feed lawn and shrub herbicides, pesticides or fertilizers.
- Lawn irrigation systems.
- Chemically treated heating systems.
- Hose connections to a water outlet or laundry tub.
- Swimming pools, hot tubs, spas.
- Private and/or non-potable water supplies located on the property.
- Water-operated sump drain devices.
- Feed lots/livestock holding areas or barnyards fed through pipes or hoses from your water supply plumbing.

### **What are examples of cross-connection and backflow scenarios?**

- Soapy water or other cleaning compounds backsiphoned into your water supply plumbing through a faucet or hose submerged in a bucket or laundry basin.
- A hose submerged in a swimming pool creates a pathway for pool water to enter your water supply plumbing.
- Fertilizers/pesticides backsiphoned into your water supply plumbing through a garden hose attached to a fertilizer/pesticide sprayer.
- Chemicals/pesticides and animal feces drawn into your water supply plumbing from a lawn irrigation system with submerged nozzles.
- Bacteria/chemicals/additives present in a boiler system backsiphon into the water supply plumbing.
- A connection made between a private well supply and the water being supplied by a public water system through the water supply plumbing.

### **What can you do to prevent backflow situations in your home or business?**

- Be aware of and eliminate cross-connections.
- Maintain air gaps. Do not submerge hoses or place them where they could become submerged.
- Use hose bib vacuum breakers on fixtures (hose connections in the basement, laundry room and outside).
- Install approved, testable backflow prevention devices on lawn irrigation systems.
- Do not create a connection between an auxiliary water system (well, cistern, body of water) and the water supply plumbing.

### **What must be done to protect the public water system?**

The water supplier is required to determine potential and actual hazards. If a hazard exists at a customer's service connection to the public water system, the customer will be required to install and maintain an appropriate backflow prevention device\* at the meter and/or at the source of the hazard.

\*Check with your water supplier on the appropriate backflow prevention device required before purchase or installation of the device.

### **Who is responsible?**

In Ohio, the responsibility for preventing backflow is divided. In general, state and local plumbing inspectors have authority over plumbing systems within buildings while Ohio EPA and water suppliers regulate protection of the distribution system at each service connection.

Water customers have the ultimate responsibility for properly maintaining their plumbing systems. It is the homeowner's or other customer's responsibility to ensure that cross-connections are not created and that any required backflow prevention devices are tested yearly and are in operable condition.

### **What is the law?**

Ohio Administrative Code Chapter 3745-95 requires the public water supplier to protect the public water system from cross-connections and prevent backflow situations. The public water supplier must conduct cross-connection control inspections of their water customers' property to evaluate cross-connection hazards. Local ordinances or water department

regulations may also exist and must be followed in addition to state regulations.

If a customer is found to have a potential or actual cross-connection contamination hazard, the customer will be required to eliminate the hazard and/or install an appropriate backflow prevention device at the service connection and/or at the hazard.

### **Special Conditions**

### **Auxiliary Water Systems**

#### **What is an auxiliary water system?**

Any water system on or available to your property other than the public water system. Used water or water from wells, cisterns or open reservoirs that are equipped with pumps or other sources of pressure, including gravity, are examples.

#### **What protection is required?**

- The auxiliary water system must be completely separated from water supply plumbing served by a public water system; and
- an approved backflow prevention device must be installed at the service connection (where the public water system connects to the customer's plumbing system).

**or**

- The auxiliary water system must be eliminated.

#### **Are there exceptions?**

The water supplier may waive the requirement for a backflow prevention device at the service connection, at the discretion of the water supplier, if:

- all components of the auxiliary water system, including pumps, pressure tanks and piping, are removed from the premises, which is defined as all buildings, dwellings, structures or areas with water supply plumbing connected to the public water system; and
- the possibility of connecting the auxiliary water system to the water supply plumbing is determined by the water supplier to be extremely low; and
- no other hazards exist; and
- the customer enters into a contract with the water supplier.

The contract will require the customer:

- to understand the potential hazard of a cross-connection;
- to never create a cross-connection between the auxiliary water system and the public water system;
- to allow an inspector to survey his/her property for hazards as long as the contract is in effect; and
- to face loss of service and other penalties if the contract is violated.

The water supplier must perform an annual inspection of the customer's contract-regulated property. It is at the water supplier's discretion to waive a backflow prevention device since the water supplier must, by law, do everything reasonably possible to protect the public water system from contamination.

### **Booster Pumps**

#### **What is the concern?**

Booster pumps connected to plumbing systems or water mains can reduce the pressure in water mains causing backsiphonage conditions.

- Booster pumps are prohibited in one, two and three family dwellings unless they draw from a surge tank filled through an air gap.
- All other booster pumps must be equipped with a low suction cut-off switch that is tested and certified every year.

### **Contacts**

#### **Need more information?**

Questions concerning backflow prevention and cross-connection control may be directed to your local water department at the number shown on the front of this brochure, to Ohio EPA's Division of Drinking and Ground Waters central office at (614) 644-2752, or to your local Ohio EPA district office at the following numbers:

Northwest District	(419) 373-3048
Northeast District	(330) 963-1200
Southwest District	(937) 285-6357
Southeast District	(740) 385-8501
Central District	(614) 728-3778

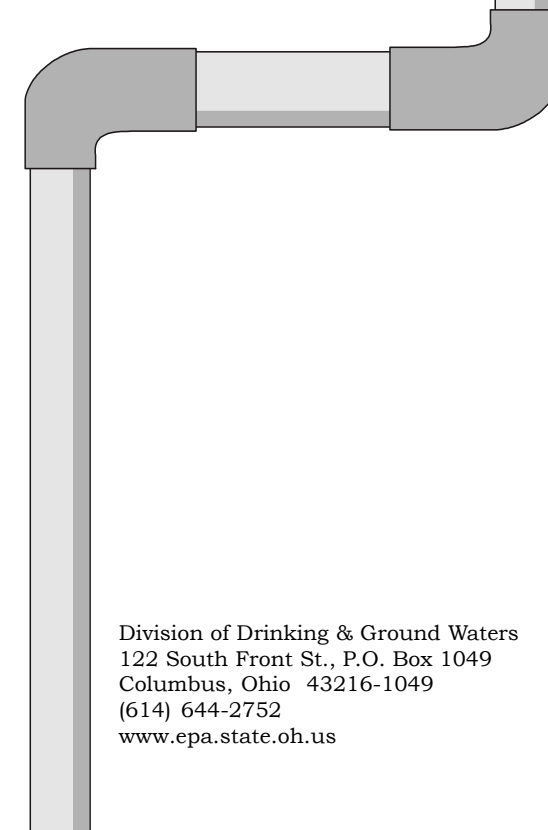
Questions regarding internal plumbing in the home may be directed to your local plumbing authority or to the Ohio Department of Commerce, Plumbing Administrator at (614) 644-3153.



# **Backflow Prevention and Cross-Connection Control**

## **Protecting our Public Water System**

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