

Backflow Prevention and Cross-Connection Control

This handout is intended to inform you of common backflow hazards that can be created during residential water use.

(Revised June 2025)

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 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.

Why should you be concerned?

- ALL cross-connections pose a potential health risk.
- Chemical burns, fires, explosives, 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.

How to report a potential cross-connection?

Call your public water system at: _____

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 (e.g., residence), 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.

What causes backsiphonage?

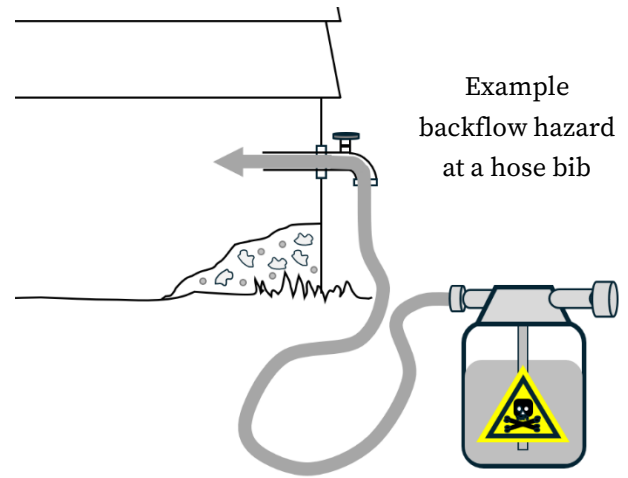
Backsiphonage occurs when there is a loss of pressure (vacuum) in a piping system. This can occur if the water supply pressure is lost or falls below the source of contamination. Similar to drinking from a glass with a straw, this condition allows liquids to be siphoned back into the distribution system.

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 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 herbicides, pesticides, or fertilizers.
- Lawn irrigation systems.
- Chemically-treated heating systems.
- Cisterns.
- 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 system through a faucet or hose submerged in a bucket or laundry basin.
- A hose submerged in a swimming pool or at a dock that creates a pathway for pool/lake 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 backsiphoned 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.

Who is responsible?

In Ohio, the responsibility for preventing backflow is divided. In general, the 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 are ultimately responsible for properly maintaining their plumbing systems. It is the homeowner's or customer's responsibility to ensure 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 also exist that 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 (for example, used water or water from wells, cisterns, or open reservoirs that are equipped with pumps or other sources of pressure, including gravity).

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 the 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 or have performed 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.

Who will inspect for cross-connections?

The water supplier will ensure periodic investigations of water use practices are conducted within a consumer's premise to determine whether an actual or potential cross-connection exists. Water consumers who have cisterns will have those cisterns inspected on an annual basis to ensure that no cross-connections are present.

Contacts - Need more information?

Questions concerning backflow prevention and cross-connection control may be directed to your local water department, 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 one of the following numbers: Northwest District (419) 352-8461, Northeast District Office: (330) 963-1200, Southeast District Office: 740-385-8501, Southwest District Office: 937-285-6357, Central District Office: (614) 644-2752.

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