



Responding to a Backflow Incident

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What is a backflow incident and what causes it?

Engineers design water systems so that water flows from the distribution system to customers. However, unusual conditions can cause the water to flow backwards—from a customer's plumbing system into the public water system. Backflow can occur at any potential physical "cross connection" between a public water system or the customer's water system and any source of liquid, solid, or gas that could contaminate the water supply.

Conditions That Cause Backflow

- 💧 **Backsiphonage:** Occurs when pressure in the public water system drops below a customer's plumbing system pressure.
- 💧 **Backpressure:** Occurs when pressure in a customer's plumbing system rises above the public water supply pressure.

Should water system operators be concerned about a backflow incident?

Yes. Backflow incidents can pose a serious threat to public health. Microbial, chemical, or physical contaminants that enter the distribution system through unprotected cross connections, or through openings in the underground piping system, may cause widespread illness, injury, or worse.

How do I know whether backflow occurred?

If a backflow incident occurs, customers may call to express concerns about degraded water quality or loss of pressure. You should respond quickly and investigate all potential backflow incidents.

Customer complaints and your own observations may be clues that a backflow event occurred.

- 💧 **Discolored or unusual looking water.** Listen for words such as discolored, cloudy, soapy, foamy, or oily.
- 💧 **Taste and odor problems.** Listen for words such as fuel, chemical, medicinal, or salty, especially after a low-pressure event.
- 💧 **Low or no chlorine residual in the distribution system.** Measure and record free chlorine residual at locations around a pressure-loss event or water quality complaint. Lower residuals may mean chlorine is reacting with substances that entered the water system.

How can an operator prevent a backflow incident?

To protect public health, state drinking water rules require water systems to develop and implement cross-connection control programs (WAC 246-290-490). Cross-connection control programs rely on backflow preventers to isolate the public water system from potential sources of contamination.

When you implement a cross-connection control program, you take proven steps to prevent backflow incidents. In the process, you will minimize the health risks associated with backsiphonage and backpressure events. It takes a determined effort to protect your water system from backflow. Use the resources below to develop your own cross-connection control program.

What should water system operators do if a backflow incident occurs?

- ◆ **Find** the cause of backflow and **assess** the risk.
- ◆ **Identify** the affected area and work to limit the spread of contamination.
- ◆ **Call** our regional office (working hours) or our after-hours number. See numbers below. We'll help you decide which customers you need to contact and whether to issue a health advisory. Your first priority is to protect your customers' health.
- ◆ **Communicate** with affected customers about what happened. Tell them what they should do to protect their health, and what the water system is doing to correct the situation.

If the risk assessment points to the possibility of chemical contamination, including a substance capable of causing bodily harm, use the *Drinking Water Warning: Backflow Incident* public notice referenced below. If you are certain the risk is limited to microbial contamination, you may use a different public notice that allows customers to use the tap water if they boil it first.

- ◆ **Flush** affected parts of the distribution system to remove any contaminants. Your flushing plan should effectively move any known contaminants to the nearest discharge point without unnecessarily spreading contamination through the distribution system.
- ◆ **Disinfect** affected parts of the system to reduce the risk of waterborne disease. If you don't normally disinfect, you should notify your customers before adding a disinfectant.
- ◆ **Collect** water quality samples after you restore normal operating pressure, including coliform and possibly certain chemical samples, to confirm your system meets drinking water standards.

What resources can I use to develop a cross-connection control program?

Please review our [Cross-Connection Control and Backflow Prevention webpage](#) for additional resources. Below is a list of helpful publications.

For More Information

Find more resources on our [Publications and Forms webpage](#).

Contact our nearest regional office from 8 AM to 5 PM, Monday through Friday. If you have an after-hours emergency, call 877-481-4901.

[Eastern Region](#), Spokane Valley 509-329-2100.

[Northwest Region](#), Kent 253-395-6750.

[Southwest Region](#), Tumwater 360-236-3030.

Other DOH Publications

[Cross Connection Control for Small Water Systems \(331-234\) webpage](#)

[Small Water System Management Program Guide \(331-134\)](#)

[Noncommunity Small Water System Management Program Guide \(331-474\)](#)

[Responding to a Pressure-Loss Event \(331-338\)](#)

[Drinking Water Warning: Loss of Pressure \(331-493-F\)](#)

[Drinking Water Warning: Backflow Incident \(331-495-F\)](#)

[News Release Announce Boil Water Advisory Template \(331-260-2\)](#)

[News Release Cancel Boil Water Advisory Template \(331-260-3\)](#)

[Emergency Disinfection of Small Systems \(331-242\)](#)



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