



State Engineer's Office

HERSCHLER BUILDING, 4-E CHEYENNE, WYOMING 82002
(307) 777-7354 FAX (307) 777-5451
seoleg@seo.wyo.gov

MATTHEW H. MEAD
GOVERNOR

PATRICK TYRRELL
STATE ENGINEER

GUIDANCE: FUNCTIONAL BACKFLOW PREVENTION DEVICES

Backflow prevention helps reduce the risk associated with back - siphonage or backflow within a water delivery system that could lead to groundwater contamination. When a backflow prevention device is required by Wyoming State Engineer's Office permit conditions, the device shall:

- meet the standards of either American Society of Sanitary Engineers (ASSE), American Water Works Association (AWWA), or the University of California Foundation for Cross-Connection Control and Hydraulic Research,
- be installed according to the manufacturer's recommendations,
- be installed in the mainline pipe upstream of branches or outlets, or one backflow prevention device must be installed on each branch,
- be sized properly for the applicable pipe, and
- be installed such that protection against back siphoning is present at all times.

Backflow prevention devices with an atmospheric vent shall be installed in a manner that prevents the entrance of any material responsible for or contributing to pollution to surface water.

For low to moderate hazard applications (e.g., gooseneck loadout facilities, top filling of portable tanks, dust abatement, water tankers, etc.), acceptable backflow prevention devices include:

- **Air Gap** - When no backpressure occurs and the device is not under constant pressure - an air gap may be used in delivering water when water is to be used for non-potable use and is sourced from a well that does not supply other potable uses. The air gap must maintain, at a minimum, two times the pipe diameter distance from the closest pipe outlet to the free water surface or to the inlet of the fill cone on the receiving vessel (e.g, stationary tank, stock tank, water tanker, etc.).
- **Pressure Vacuum Breaker** - When no backpressure occurs and the device is under constant pressure, a properly installed pressure vacuum relief device may be used. The vacuum relief must be installed at least one foot above the highest point of water flow in the piping system or tank.
- **Double Check Valve** - When there is backpressure and the device is under constant pressure a double check valve (with or without an atmospheric vent) may be used.

For low to high hazard applications (e.g., bottom filled tanks, bulk mixing operations, etc.), acceptable backflow prevention devices include:

- **Reduced Pressure Principal Backflow Prevention Device** - For high hazard applications, a reduced pressure principal backflow shall be the only device installed. These devices are designed with double check valves and a low pressure zone containing an atmospheric vent. They can be installed in almost any situation.

Additional References:

EPA, Cross-Connection Control: A Best Practices Guide

http://www.epa.gov/safewater/smallsystems/pdfs/guide_smallsystems_crossconnectioncontrol.pdf

EPA, Cross Connection Control Manual

http://water.epa.gov/infrastructure/drinkingwater/pws/crossconnectioncontrol/crossconnectioncontrol_manual.cfm

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Surface Water
(307) 777-6475

Ground Water
(307) 777-6163

Board of Control
(307) 777-6178