

High Hazard Cross-Connections

RESPONSIBLE AUTHORITIES

In response to the federal Safe Drinking Water Act (SDWA) Ground Water Rule (GWR) and documented incidents in Minnesota, the Minnesota Department of Health (MDH) classified high-hazard cross-connections that are not adequately protected as a Significant Deficiency (SD) for all Community Public Water Systems (CPWSs). When an SD is found during a sanitary survey, the community public water system purveyor must correct it within 120 days.

MDH defines high-hazard cross-connections as those that would require a Reduced Pressure Zone (RPZ) backflow preventer or an air gap. However, CPWSs are strongly encouraged to adopt a more comprehensive approach by addressing all cross-connections through a cross-connection control program.

In addition, the Department of Labor and Industry (DLI) has adopted a new Minnesota Plumbing Code, which went into effect January 23, 2016. As a result of the revised plumbing code, all testable backflow devices installed on or after this date, which includes RPZs, pressure type vacuum breakers, spill-proof vacuum breakers, and double check valve assemblies, must be tested and inspected annually. Also, notifications of the installation and testing of these backflow devices need to be provided to the community public water system purveyor. More information on testing and maintenance of testable backflow devices is available on-line: [Fact Sheet: Backflow Devices](http://www.dli.mn.gov/sites/default/files/pdf/fs_backflow.pdf) (http://www.dli.mn.gov/sites/default/files/pdf/fs_backflow.pdf). It is not the responsibility of the purveyor to ensure compliance with the reporting requirement, but the requirement does support an effective cross-connection control program.

In response to this, MDH is requiring CPWSs to continue to require SD compliance for high-

hazard cross-connections but also recommend low-hazard cross-connections (those that would require pressure type vacuum breakers, spill-proof vacuum breakers, and double check valve assemblies but not RPZs) be addressed.

MDH is working to propose a rule revision in the near future requiring CPWSs meet the five standard elements of a cross-connection control program: local authority, public education and awareness, trained/certified staff, written records, and enforcement. An effective cross-connection control program is designed to be self-supportive, and the specific details associated with each element would be left to the discretion of the CPWS to meet their unique needs.

Any local unit of government, which has a Building Code ordinance, must use the Minnesota Plumbing Code as the criterion for proper installation and maintenance of plumbing systems. MN Rules 4714.0603.5.23 requires that there be an ongoing testing program for all testable backflow devices. This program should also incorporate reduced pressure zone backflow assembly devices that were installed under 4715.2161 and other existing testable backflow devices.

In addition to state requirements, the SDWA, enforced through the United States Environmental Protection Agency (EPA), holds the water purveyor responsible for ensuring the quality of the water all the way to the free-flowing outlet of the consumer. This means the purveyor is responsible for assuring that the water quality is not compromised as a result of delivery through the distribution system. Pursuant to this requirement, the EPA stresses the importance of comprehensive local cross-connection control programs, including the need for periodic testing of backflow preventers.

The reason these devices must be tested regularly is that they are the final and often only line of defense to protect the quality of water within plumbing water distribution systems from contamination by other systems or equipment. After considerable money and effort is spent to assure safe water quality coming from the water system, it is important to assure that nothing is done to contaminate water within the distribution system. Requiring backflow preventers is a preventative measure, as the name implies, intended to help preserve water quality. Backflow preventers are, however, mechanical devices with internal moving parts, and like any mechanical device, they must be properly maintained to assure they will function when needed. Proper maintenance of the device is just as important as installation of the device itself.

It must be noted that local units of government that have a Building Code ordinance, but do not pursue a backflow preventer testing program may incur liability in the event of a contamination-related problem resulting from a cross-connection within a potable water system.

The Minnesota Plumbing Code is administered by the Minnesota Department of Labor and Industry (DLI), and DLI can delegate authority for the plumbing code to a local authority. Below are references and resources CPWSs can use in addressing suspected or identified high-hazard cross-connections.

Statute and Rule References

CFR 141.403 (a) (4) *Treatment Technique Requirements for Ground Water Systems*. For the purposes of this subpart, significant deficiencies include, but are not limited to, defects in design, operation, or maintenance, or a failure or malfunction of the sources, treatment, storage, or distribution system that the State determines to be causing, or have the potential for causing, the introduction of contamination into the water delivered to customers.

Subpart H (*Surface Water Systems*) CFR 141.173 - Filtration; CFR 141.174 (a) and (b) - Filtration Sampling Requirements; and CFR 142.16(b)(3)(i) (A) thru (H) Sanitary Survey means an onsite review of the water source (identifying sources of contamination using results of source water assessments where available), facilities, equipment, operation, maintenance, and monitoring compliance of a public water system to evaluate the adequacy of the system, its sources and operations and the distribution of safe drinking water. Definition of a significant deficiency: any defect in a system's design, operation, maintenance, or administration, as well as any failure or malfunction of any system component that the State determines to cause, or have the potential to cause, unacceptable risk to health that could affect the reliable delivery of safe drinking water.

MN Rules 4720.0025 *Unsafe Water Connections*. There shall be no physical connection between any public water system intended for potable or domestic use and any system, equipment, or device that may serve as a source of contamination, unless protected by a properly maintained backflow preventer approved by the commissioner.

MN Rules, 4714.0100, Item A. All premises intended for human habitation occupancy, or use shall be provided with a potable water supply that meet the requirements of the commissioner of health. *The water supply shall not be connected with unsafe water sources nor shall it be subjected to the hazards of backflow or back-siphonage.*

MN Rules, 4714.0602.1 *Prohibited Installation*. No installation of potable water supply piping, or part thereof, shall be made in such a manner that it will be possible for used, unclean, polluted, or contaminated water, mixtures, or substances to enter a portion of such piping from a tank, receptor, equipment, or plumbing fixture by reason of back-siphonage, suction, or other cause, either during normal use and operation thereof, or where such tank, receptor, equipment, or plumbing fixture is flooded or subject to pressure exceeding the

operating pressure in the hot or cold water piping.

MN Rules, 4714.0602.2 *Cross-Contamination*. Unless there is provided a backflow prevention device approved for the potential hazard and maintained in accordance with this code, no person shall make a connection or allow one to exist between pipes or conduits carrying domestic water supplied by a public or private building supply system, and (1) pipes, conduits, or fixtures containing or carrying water from any other source or containing or carrying water that has been used for any purpose whatsoever, or (2) piping carrying chemicals, liquids, gases, or substances whatsoever. Each point of use shall be separately protected where potential cross-contamination of individual units exists. Water used for cooling or heating of equipment or other purposes shall not be returned to the potable water system. Such water shall be discharged into the drainage system through an air-gapped indirect waste or other approved method of disposal.

MN Rules, 4714.0602.3 *Backflow Prevention*. No plumbing fixture, device, or construction shall be installed or maintained, or shall be connected to a domestic water supply, where such installation or connection provides a possibility of polluting such water supply or cross-connection between a distributing system of water for drinking and domestic purposes and water that becomes contaminated by such plumbing fixture, device, or construction unless there is provided a backflow prevention device approved for the potential hazard.

MN Rules, 4714.0603.1 *General*. Cross-connection control shall be provided in accordance with the provisions of this chapter. No person shall install a water-operated equipment or mechanism, or use a water-treating chemical or substance, where it is found that such equipment, mechanism, chemical, or substance causes pollution or contamination of the domestic water supply. Such equipment or mechanism shall be permitted where equipped with an approved backflow prevention device or assembly.

MN Rules, 4714.0603.2 *Approval of Devices or Assemblies*. Before a device or an assembly is installed for the prevention of backflow, it shall have first been approved. Devices or assemblies shall be tested in accordance with recognized standards or other approved standards. Backflow prevention devices and assemblies shall comply with Table 603.2, except for specific applications and provisions as stated in Section 603.5.1 through Section 603.5.23. Devices or assemblies installed in a potable water supply system for protection against backflow shall be maintained in good working condition by the person or persons having control of such devices or assemblies. The devices or assemblies shall be tested at the time of installation, repair, or relocation and not less than on an annual schedule thereafter, or more often where required by the Authority Having Jurisdiction. Where found to be defective or inoperative, the device or assembly shall be repaired or replaced. No device or assembly shall be removed from use or relocated, or other device or assembly substituted, without the approval of the Authority Having Jurisdiction. Testing shall be performed by a certified backflow assembly tester in accordance with ASSE Series 5000.

MN Rules, part 4714.0603.5.23 *Installation of Testable Backflow Prevention Assembly*. Testable backflow prevention assemblies meeting ASSE Standard 1013, 1015, 1020, 1047, 1048, or 1056 shall be installed, tested, maintained, and removed in accordance with sections 603.5.23.1 through 603.5.23.4.

603.5.23.1 *Notification of Installation*. The administrative authority shall be notified before installation of a testable backflow prevention assembly. The public water supplier shall be notified of the installed testable backflow preventer assembly within 30 days following installation on a community public water system.

603.5.23.2 *Testing and Maintenance*. The installation of a testable backflow prevention assembly is permitted only when a periodic testing and inspection program

conducted by qualified personal is provided by an agency acceptable to the administrative authority. Inspection intervals shall not exceed one year. The administrative authority may require more frequent testing if deemed necessary to ensure protection of the potable water. A testable backflow prevention assembly shall be inspected after initial installation to ensure that it has been properly installed and that debris resulting from the piping installation has not interfered with the functioning of the assembly.

603.5.23.3 *Inspection and Records.* A test and inspection tag shall be affixed to the testable backflow prevention assembly. The tester shall date and sign the tag and include the tester’s backflow prevention tester certification number. Written records of testing and maintenance shall be maintained and submitted to the administrative authority, and to the public water supplier, within 30 days of testing if installed on a community public water system.

603.5.23.4 *Notification of Removal.* The Authority Having Jurisdiction, in addition to the public water supplier, shall be notified within 30 days following removal of a testable backflow prevention assembly from a community public water supply system..

MN Rules 4714.0203.0, Definitions, Subp. 2 *Administrative Authority.* Means the commissioner of Labor and Industry.

Exception: When a governmental subdivision adopts and maintains a comprehensive plumbing enforcement program that is conducted by personnel who are knowledgeable about plumbing installation requirements, and includes enforcement of all code provisions including materials, methods, inspection, and testing, the administrative authority shall be the governing body of the adopting unit of government or a duly designated representative of the governing body or a person working under contract with the governing body.

Responsible Authorities (plan review, inspections, and code enforcement)

For each of the following establishments, if you suspect or identify an inadequately protected high-hazard cross-connection, you can contact the appropriate agency for follow-up or enforcement action, as appropriate:

Food, Beverage, or Lodging Establishment

1. local plumbing code authority, or
2. local MDH or delegated program licensing authority – see [Minnesota State and Local Food, Pools and Lodging Contacts](http://www.health.state.mn.us/divs/eh/food/license/locals.pdf) (<http://www.health.state.mn.us/divs/eh/food/license/locals.pdf>)

Pools

1. local plumbing code authority, or
2. local MDH or delegated program licensing authority – see [Minnesota State and Local Food, Pools and Lodging Contacts](http://www.health.state.mn.us/divs/eh/food/license/locals.pdf) (<http://www.health.state.mn.us/divs/eh/food/license/locals.pdf>)

In-Store Delis, Grocery Stores, Butcher Stores, Bakeries, or Convenience Stores

1. local plumbing code authority, or
2. local MN Department of Agriculture licensing authority – see [Food Licenses](http://www.mda.state.mn.us/food-feed/food-licenses) (<http://www.mda.state.mn.us/food-feed/food-licenses>)

Food Processing Facilities

1. local plumbing code authority, or
2. local U.S. Department of Agriculture licensing authority – see [Regulatory Compliance](https://www.fsis.usda.gov/wps/portal/fsis/topics/regulatory-compliance) (<https://www.fsis.usda.gov/wps/portal/fsis/topics/regulatory-compliance>)

Health Care Facilities and Providers

1. local plumbing code authority, or
2. MDH licensing authority – see [Health Regulation - Facilities and Providers](http://www.health.state.mn.us/divs/fpc/index.html) (<http://www.health.state.mn.us/divs/fpc/index.html>)

Building Plumbing Systems (in general)

You can request the local plumbing code authority for investigation or take enforcement action.

Lawn Irrigation Systems

In some situations, an RPZ backflow preventer may not be a necessary device for a lawn irrigation system, and other devices may be more appropriate. If you suspect or identify an inadequately protected high-hazard cross-connection, you can request the local plumbing code authority take enforcement action.

You can find the local plumbing code (and building code) authority for your CPWS at the [Minnesota Department of Labor and Industry \(DLI\)](http://www.dli.state.mn.us/) (<http://www.dli.state.mn.us/>). If the local plumbing code authority or specific licensing authority does not take enforcement action, you can contact DLI, as they retain the ultimate authority to enforce the Minnesota Plumbing Code. In addition, any CPWS that is a local government unit can take steps to adopt and enforce the Minnesota Plumbing Code by ordinance.

Additional Resources

- [American Backflow Prevention Association](https://abpa.org) (<https://abpa.org>)
- [League of Minnesota Cities](https://www.lmc.org) (<https://www.lmc.org>) (ordinances)
- [Minnesota American Water Works Association](https://www.mnawwa.org) (<https://www.mnawwa.org>)
- [Minnesota Rural Water Association](http://www.mrwa.com) (<http://www.mrwa.com>) (templates and helpful hints for implementing cross-connection control programs)
- [MDH Drinking Water Protection](http://health.mn.gov/water) (<http://health.mn.gov/water>) (grant opportunities and fact sheets)
- [Minnesota Department of Labor and Industry](http://www.dli.state.mn.us) (<http://www.dli.state.mn.us>)

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July 2016

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