

Board of Public Utilities

Rules & Regulations

For

Cross Connections & Backflow Prevention

For the

Cheyenne Water System

Supplements Chapter
Of the
Cheyenne City Code

FEBRUARY 1999

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SECTION 1
Authority

Pursuant to Chapter 44, Section 35 of the Cheyenne City Code, the Cheyenne Board of Public Utilities (BOPU) shall make all rules and regulations necessary for the protection from hazards and contaminants, which have the potential of entering the drinking water, supply. These rules and regulations supplement the applicable referenced code.

SECTION 2
**Rules & Regulations for Control of Backflow &
Cross Connections Supplements Chapter
Of the Cheyenne City Code**

A. Scope and Purpose

1. To protect the public drinking water system of Cheyenne from contamination or pollution by isolating within the customer's internal distribution system(s) or the customer's private water supply, such contaminants or pollutants that could backflow into the public water system; and,
2. To promote the elimination or control of existing internal cross connections, actual or potential, between the customer's drinking water system(s) and non-drinkable water systems, plumbing fixtures, and industrial piping systems; and,
3. To provide for the maintenance of a continuing program of cross-connection control and backflow prevention that will systematically and effectively prevents the contamination or pollution of all drinking water systems.

B. Responsibility

The Director of the Board of Public Utilities shall be responsible for the protection of the public drinking water distribution system from contamination or pollution due to the backflow of contaminants or pollutants through the water service connection. If, in the judgment of the Director, or Designee, an approved backflow-prevention assembly is required (at the customer's water service system), the Director or his/her designee shall give written notice to the customer to install an approved backflow-prevention assembly(s) at specific location(s) on his/her premises. The customer shall immediately install such approved assembly(s) at his/her own expense. Failure, refusal, or inability by the customer to install, have tested, and maintain the backflow prevention assembly(s) will

constitute grounds for disconnecting water service to the premises until such requirements have been met.

The Consumer has the primary responsibility for preventing pollutants and contaminants from entering his drinking water system and the public water system. The Consumer's responsibility starts at the point of delivery (service corporation at the water main), and includes all of his/her water system. The Consumer, at his own expense, will install, operate, test and maintain approved backflow prevention devices as required by these Rules and Regulations.

All new construction, and remodeling, whereby a City Building permit is required and is determined to be a high risk contamination source, will have the specific backflow prevention (Per attached Table I) and a thermal expansion tank to be installed. A backflow prevention device, when determined as a requirement by the Cheyenne Plumbing Code, will be installed at existing residences.

The Building Permit Department of the City of Cheyenne has the responsibility to review building plans and inspect plumbing as it is installed. Requirements for backflow prevention devices and type of devices will be specified during the review of the plan.

SECTION 3 **Definitions**

- A. Director Means: The Director of the Board of Public Utilities of Cheyenne, Wyoming.
- B. Auxiliary Water Supply Means: Any water supply on or available to the premises other than the Cheyenne Board of Public Utilities approved public water supply. Auxiliary water supplies may include any natural source(s); such as well, spring, river, stream, harbor, and so forth; used waters; or industrial fluids.
- C. Backflow Means: The reversal of flow in a drinking water distribution system.
- D. Backpressure Means: A pressure, higher than the supply pressure.
- E. Back-siphon Means: Backflow caused by negative or reduced pressure in the water supply main.

- F. Backflow Preventer Means: An assembly/device designed to prevent backflow.
1. Air Gap Means: The unobstructed vertical distance through the free atmosphere between the lowest opening from any pipe or faucet conveying water or waste to a tank, plumbing fixture, receptor, or other assembly and the flood level rim of the receptacle.
 2. Reduced-Pressure Backflow-Prevention Assembly Means: The approved reduced-pressure principle backflow-prevention assembly consisting of two independently acting approved check valves together with a hydraulically operated, mechanically independent pressure differential relief valve located between the check valves and below the first check valve. Such units are located between two tightly closed resilient-seated shut off valves as an assembly and equipped with properly located resilient-seated test cocks. These units vent to atmosphere and may cause flooding if proper drainage is not provided.
 3. Double Check Valve Assembly Means: The approved double check valve assembly consists of two internally loaded check valves, (either spring loaded or internally weighted), installed as a unit between two tightly closed resilient-seated shutoff valves and fittings with properly located resilient-seated test cocks.
 4. Pressure Vacuum Breaker Valve Means: A device, which operates at atmospheric pressure, which prevents backflow siphon when pressure is reduced upon loss of water pressure.
 5. Hose Bib Vacuum Breaker Means: A device attached at the hose bib which prevents backflow into the water system upon loss of water pressure and also provides freeze protection of the device. This device protects both the occupants and other customers being provided drinking water by the Board of Public Utilities.
 6. Dual Check Valve Means: A self-closing device designed to permit the flow of fluid in one direction. A dual check valve is not an approved backflow prevention device.
- G. Contamination Means: An impairment of a drinking water supply by the introduction or admission of any foreign substance that degrades the quality and/or creates a health hazard.
- H. Cross Connection Means: A connection or potential connection between any part of the drinking water system and any other environment containing other substances in a manner that, under any circumstances would allow such substances to enter the drinking water system.

- I. Hazard - Health Means: If introduced into the drinking water could cause illness, disease, or have a high possibility of causing such effects.
- J. Hazard - Non-Health Means: A cross connection or potential cross connection involving any substance that generally would not be a health hazard but would constitute a nuisance or be aesthetically objectionable, if introduced into the drinking water supply.
- K. High Risk System Means: Any system containing a fluid or solution that may be chemically, biologically, or otherwise contaminated or polluted in a form or concentration, which may constitute a health hazard, if introduced into an approved water supply. This may include, but not be limited to: polluted or contaminated waters; all types of process waters and used waters originating from the public drinking water system that may have deteriorated in sanitary quality; chemicals in fluid form; (i.e. insecticides, fertilizers, Glycol Alcohol, etc.) plating acids and alkali's; circulating cooling waters connected to an open cooling tower; and/or cooling towers that are chemically or biologically treated or stabilized with toxic substances; contaminated natural waters, such as wells, springs, streams, rivers, bays, harbors, seas, irrigation canals or systems, and so forth; oils, gases, glycerin, paraffin's, caustic and acid solutions, and other liquid and gaseous fluids used for fire fighting purposes. Systems so defined are considered a "high risk" for contamination of the public water system; and are a potential for endangering the health and safety of the public.
- L. Thermal Expansion Tank/Reservoir Means: A device installed in the water service, after the meter, to allow for expansion due to heated water. This device is required to provide safety from damage that may result when a backflow prevention device is installed in the owner's water service line.
- M. Pollution Means: The presence of any foreign substance in water, which results in rendering the water unusable for human consumption.
- N. Water Purveyor Means: The Water Purveyor is the Cheyenne Board of Public Utilities, owner and operator of Cheyenne's public water supply and distribution systems.
- O. Water - Drinking Means: Water that is safe for human consumption as described by the public health authority having jurisdiction.
- P. Water - Non-drinking Means: Water that is not safe for human consumption.

- Q. Service Connection Means: The terminal end of a service connection from the public drinking water system (at the corporation), where the Board of Public Utilities loses jurisdiction and control over the public water at its point of delivery to the customer's water system. This includes water supplied from fire hydrants, temporary service and emergencies.
- R. Used Water Means: Any water supplied by the Cheyenne Board of Public Utilities from the public drinking water system to a consumer's water system after it has passed through the point of delivery and is no longer under the sanitary control of the Board of Public Utilities.

SECTION 4 **Requirements**

A. Water System

- 1. The water system shall be considered as made up of two parts: The public utility system and the private customer system.

- a. Public Utility System: Consists of the source facilities and the distribution system, and shall include all those facilities of the water system under the complete control of the utility, up to the point where the customer's system begins.

The source shall include all components of the facilities utilized in the production, treatment, storage, and delivery of water to the distribution system.

The distribution system shall include the network of conduits used for the delivery of water from the source to the customer's system.

- b. The Private Customer's System: Includes those parts of the facilities beyond the termination of the utility distribution system (the corporation) that are utilized in conveying utility-delivered domestic water to point of use.

All services, including the corporation at the water main, the service line and curb stop, and service lines on private property is the responsibility of the home owner as stated in City Code.

The meter is the property of the BOARD OF PUBLIC UTILITIES, and is the only item beyond the corporation, which is not the responsibility of the homeowner.

B. Policy

1. No water service connection to any premises shall be installed or maintained by the Board of Public Utilities unless the water supply is protected as required by city laws and these rules and regulations. The Board of Public Utilities shall discontinue Service of water to any premises if a backflow prevention assembly established by these rules and regulations is not installed, tested, and maintained; or if it is found that a backflow prevention assembly has been removed or bypassed. If an unprotected cross connection exists on the premises, service will not be connected or restored until such conditions or defects are corrected.
2. The customer's system should be open for inspection at all reasonable times to authorized representative of the Board of Public Utilities to determine whether cross connections or other structural or sanitary hazards, including violations of these regulations, exist. When such a condition becomes known, the Board of Public Utilities shall deny or immediately discontinue service to the premises by providing for a physical break in the service line (removal of meter), until the customer has corrected the condition(s) in conformance with applicable city law and plumbing regulations.
3. An approved backflow prevention assembly as required shall be installed on each service line to a customer's water system at or near the property line or immediately inside the building being served, when required by the Board of Public Utilities/plumbing inspector.

In the case of premises having an auxiliary water supply that is not or may not be safe bacteriological or chemically, the public water system shall be protected against backflow from the premises by a properly specified backflow prevention assembly, located before the first branch line leading off the service line, preferably adjacent to the meter.

If the Director, or Designee finds that the backflow prevention device is defective and constitutes a hazard to health, an approved backflow prevention assembly meeting the requirements of these Rules and Regulations shall replace the backflow prevention assembly.

C. Licensing or Certification

That no person shall test or repair backflow prevention assemblies unless he/she is a holder of a valid testers license or certification. The purpose of licensing testers is to ensure that the persons engaged in testing and repairing backflow prevention assemblies have adequate skills and training, and continue to perform installation, maintenance and testing in a satisfactory manner. The backflow prevention tester will continually maintain and renew his or her certification when due, as established in the Uniform Plumbing Code. Certification/recertification will be administered by a backflow prevention assembly certified instructor endorsed by AWWA, ASSE Standards and USC-FCCHR specifications. Criteria for certification of testers are established in accordance with AWWA, ASSE Standards and FCCHR specifications. Verification of tester certification will be forwarded to the Cheyenne Board of Public Utilities by each respective certified tester upon certification/recertification, or transfer from other states. Test gauge is required to be calibrated annually.

SECTION 5
Related Compliance Policies & Codes

The authority to implement and maintain this program on cross connection control is contained in the following legislative actions:

- A. Chapter 44, Section 35 of the City Code of Cheyenne, Wyoming.
- B. DEQ Manual Chapter XII, Water Quality Rules & Regulations.
- C. Occupational Safety and Health Administration Federal Register #202 part 2, page 22234, subparts I.
- D. Uniform Plumbing Code of the International Plumbing and Mechanical Officials, Chapter 10, Section 1001, 1002, 1003.2.0.
- E. Uniform Pool & Spa Code.
- F. Uniform Solar Code.

SECTION 6
References for Implementing Backflow Prevention

- A. Reference manuals adopted for guidelines on cross connection control.
1. Manual of cross-connection control “Foundation for Cross-Connection Control & Hydraulic Research”, University of Southern California.
 2. Cross-Connection Control Committee, Pacific Northwest Section AWWA Manual of Accepted Procedures and Practices.
 3. Recommended Practice for Backflow Prevention and Cross-Connection Control AWWA Manual M14.
 4. Unified Plumbing Code.
 5. Chapter 12, DEQ Rules & Regulations for “Water Quality”.

SECTION 7
General Procedures

- A. If, in the judgment of the Director, or Designee, an approved backflow prevention device is required (at the customer’s water service connection; or within the customer’s private water system) for the safety of the public drinking water, the Director or his/her Designee shall give written notice to the Consumer to install such an approved backflow prevention device(s) at specific locations(s) on his premises. The consumer shall immediately install such approved device(s) at his own expense. Failure to comply will result in service being terminated.
- B. All new construction and plumbing remodeling work, requiring a City Building/Plumbing permit, shall install the specified backflow prevention and expansion protection devices in accordance with this policy the Cheyenne Board of Public Utilities design specifications, the Uniform Plumbing Code, and manufacturer's specifications. The requirement for these devices will be determined by the City of Cheyenne’s Plumbing Code, and will be based upon the associated hazards with-in the residence, which could adversely impact the quality of water in the distribution system.

- C. Water service shall be discontinued by the Board of Public Utilities if the specified backflow prevention device is not installed, tested and maintained, has been removed or bypassed, or an unprotected cross connection exists on the premises. The Board of Public Utilities will not restore services until such conditions or defects are corrected.
- D. Backflow prevention devices shall be installed within any premises where, in the judgment of the Director or his or her Designee, the nature and extent of activities, or materials stored on the premises and could present an immediate and dangerous hazard to health should a backflow or cross connection occur.
- E. All commercial building plans must be submitted to the City Building Inspector for review and approval. Building plans must show the following:
 - 1. Water service type, size and location.
 - 2. Meter size and location.
 - 3. Backflow prevention assembly size, type and location (when required).
 - 4. Fire sprinkling system(s) service line, size and type of backflow prevention (if applicable).
- F. Installation of a Backflow Assembly
 - 1. Backflow prevention assemblies are to be installed in an accessible location to facilitate maintenance, testing and repair.
 - 2. All containment backflow prevention assemblies shall be installed immediately after the water meter, and before any branch of the service connection. Where meters are installed in meter pits, the backflow prevention assembly will be installed in the residence either prior to the branch of the service connection, or above ground and protected from frost/freezing.
 - 3. Prior to installing a backflow prevention assembly, pipelines should be inspected and cleaned to remove foreign material.
 - 4. Connections or tees are not permitted between the meter and the service line backflow prevention assembly.
 - 5. The relief valve discharge on the reduced pressure assembly requires a specified air gap.
 - 6. Backflow prevention valves are not to be used as the inlet or outlet valve of the water meter. Test cocks are not to be used as supply connections.

7. Expansion tanks are to be installed to control internal expansion when a backflow prevention device is installed. Installation will be in compliance with the Manufactures installation specifications.
8. All residences will have atmospheric vacuum breakers installed on hose bibs at the wall and hydrant as applicable, to protect the occupant and all Board of Public Utilities customers from backflow contamination. This device will be an automatic self-draining device, designed for freeze protection.

G. Testing

1. In order to insure that backflow prevention assemblies continue to operate satisfactorily, it will be necessary that a certified tester test them at the time of installation and on an annual schedule thereafter. Such test will be conducted in accordance with F.C.C.C.H.R. performance standards and field test procedures as established by the Board of Public Utilities under these Rules and Regulations.
2. The City Building Plumber Inspector will verify that a certified tester tests all installed backflow prevention devices on new construction.
3. Costs for design, installation, maintenance, repair, and testing are the responsibility of the customer.
4. Grandfather clauses are not applicable. All laws and regulations apply regardless of the age of the facility.
 - a. All fire sprinkling lines shall have a minimum protection of an approved double check valve for containment of the system.
 - b. All glycol (ethylene or propylene), or antifreeze systems shall have an approved reduced pressure zone assembly for containment.
 - c. Dry fire systems shall have an approved double check valve installed downstream of the air pressure valve.
 - d. A single-family residence with a fire sprinkler system and domestic water combined shall have a double check valve when no chemicals are used.

5. All fire sprinkler systems shall conform to the following sections of the National Fire Protection Association Pamphlets Number Thirteen and Twenty Four; Pamphlets Number Thirteen, sections 1-11.2 Hydrostatic Testing, and sections 1-1.2.2 Allowable Leakage. Pamphlet number twenty-four "Private Fire Service mains and Their Appurtenances".

SECTION 8 **Right-of Entry**

A representative of the Board of Public Utilities shall carry proper credentials of his/her office. By previously arranged appointment and upon presentation of proper credentials, the Board of Public Utilities representative shall have the right-to-entry to inspect all buildings and premises for cross-connection and backflow prevention requirements relative to existing hazards. This right-of-entry shall be a condition of water service in order to protect the health, safety and welfare of the people throughout the Cheyenne Board of Public Utilities distribution system.

SECTION 9 **Violations**

- A. Failure of the customer to cooperate in the installation, maintenance, testing or inspection of backflow prevention assemblies required by these regulations shall be grounds for the disconnection of water service to the premises and a reconnection fee charged.
- B. Service may be immediately disconnected without written notice whenever in the judgment of the Board of Public Utilities such action is necessary to protect the purity of the; public drinking water supply or the safety of the water system. (Reference the EPA and DEQ "Safe Drinking Water Act-1986).

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TABLE 1
Backflow Prevention Devices, Assemblies and Methods

Degree of Hazard

| Device, Assembly or Method | Pollution (Low Hazard) | | Contamination (High Hazard) | | Notes |
|---|------------------------|---------------|-----------------------------|---------------|---|
| | Back-Siphonage | Back-Pressure | Back-Siphonage | Back-Pressure | |
| Air Gap | ✓ | | ✓ | | See Table 1 Note |
| Atmospheric Vacuum Breaker | ✓ | | ✓ | | Not allowed under continuous pressure situations. |
| Spill-Proof Pressure-Type Vacuum Breaker | ✓ | | ✓ | | |
| Double Check Valve Backflow Preventer | ✓ | ✓ | | | |
| Pressure Vacuum Breaker | ✓ | | ✓ | | |
| Reduced Pressure Principle Backflow Preventer | ✓ | ✓ | ✓ | ✓ | |
| Inspectible Dual Check | ✓ | | | | Restricted to residential and domestic services. |

Table 1 Note - Minimum Air Gaps for Water Distribution: For spouts with an effective opening diameter of ½" or less, the minimum air gap when the discharge is not affected by side walls shall be 1". The minimum air gap when the discharge is affected by sidewalls shall be 1½". For effective openings greater than ½", the minimum air gap shall be 2 times the effective opening diameter when the discharge is not affected by side walls. The minimum air gap when the discharge is affected by sidewalls shall be three times the effective opening diameter. (Reference Chapter XII, Table 1, DEQ Rules & Regulations for Backflow Control).