

**RULES AND REGULATIONS  
FOR  
WATER AND WASTEWATER SERVICE**



**EAGLE RIVER  
WATER & SANITATION  
DISTRICT**

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**APPENDIX G**

**BACKFLOW PREVENTION AND CROSS  
CONNECTION CONTROL (BPCCC) PROGRAM**

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## **SECTION I - GENERAL**

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### **1.1 Purpose**

Uncontrolled cross connections have the potential to cause severe health risks to customers of the water distribution system. Uncontrolled cross connections are not permitted.

Water services shall be designed, installed, retrofitted, and maintained in such a manner to prevent contamination from non-potable liquids, solids or gases being introduced into the potable water supply through cross connections or any other piping connections. Customers shall design, install, maintain, upgrade, test, and inspect backflow prevention assemblies and backflow prevention methods in accordance with these rules and regulations.

Customers shall permit authorized representatives of the district to access their property for the purpose of surveying, testing, and inspecting backflow prevention assemblies and backflow prevention methods, in accordance with Article I, 1.12 of these rules and regulations, Authority to Access Customer Property.

All laws and regulations apply as of the adoption of these Rules and Regulations, regardless of the age of the Water Service and/or the age of the building, home, facility or structure served. No “grandfathering” of this requirement exists or shall be asserted.

### **1.2 Applicability**

#### **1.2.1 Commercial and Multi-Family Applications**

An approved backflow prevention assembly or method is required for all commercial and multi-family water services where the following exist:

- a. Fire suppression systems;
- b. Irrigation systems including dedicated irrigation connected directly to the water main;
- c. Chemical process systems, including chemicals connected for temporary maintenance;
- d. Hydronic heating and cooling systems, industrial boilers, chillers, cooling towers, double wall heat exchangers and solar panels;
- e. Auxiliary water sources, display fountains, hot tubs, pools, reclaimed water systems, graywater systems and onsite storage tanks; and
- f. Any other connection that poses unacceptable risk to public health.

### **1.2.2 Types of Commercial Applications**

An approved backflow prevention assembly or method is required for the following types of commercial and industrial service connections:

- a. Dry cleaning and laundries;
- b. Mortuaries;
- c. Hair salons;
- d. Laboratories;
- e. Auto repair shops;
- f. Car washes;
- g. Bulk fill water stations;
- h. Restaurants;
- i. Hospitals, dental facilities, medical facilities and clinics, and blood banks;
- j. Veterinary, pet stores, and livestock facilities;
- k. Manufacturing facilities;
- l. Green houses and agricultural commerce; and
- m. Other commercial and industrial service connections that pose unacceptable risk to public health.

### **1.2.3 High Risk Single-Family Residential Applications**

An approved backflow prevention assembly or method is required for single-family residential water services where any of the following conditions exist:

- a. Dedicated irrigation lines (from the water main);
- b. Dedicated fire suppression system lines and chemically enhanced fire suppression systems (multi-purpose fire suppression systems are not required to be controlled where each branch of the suppression system terminates at a regularly used fixture);
- c. Auxiliary water sources (e.g. wells, ponds, lagoons, irrigation ditches), hot tubs or swimming pools piped with permanent plumbing, reclaimed water systems, graywater systems, or onsite water storage tanks with permanent plumbing;
- d. Connections to a home's potable water supply system from home business and hobbies including but not limited to agricultural commerce and hydroponic systems, doctor's offices, photo laboratories, hide tanning operations, and metal plating operations; and
- e. Any other connection that poses unacceptable risk to public health.

## **SECTION II – APPROVAL, DESIGN, AND INSTALLATION**

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### **2.1 Approval**

The District shall approve all assemblies and methods in writing prior to installation.

For new construction and remodels, in cases where an uncontrolled cross connection is identified, or where the existing assembly or method does not meet District requirements, or as required by the District, the Customer shall submit a New Account Application with a complete set of building plans including assembly or method design, approved by the applicable building permit authority.

Existing assemblies and methods that do not meet the requirements of the District shall be replaced with an approved assembly or method within 60 days of notification by the District or a certified cross-connection control technician. Uncontrolled cross connections shall be controlled within 120 days of discovery.

All costs for design, installation, maintenance, testing, repair and replacement are the responsibility of the Customer.

### **2.2 Required Assembly or Method based on Application and Identified Contaminant**

The District will evaluate each submittal and application using industry standards outlined in manuals such as the *Colorado Cross-Connection Control Manual*, the *EPA Cross-Connection Control Manual* and the current *Manual of Cross-Connection Control* (USC Manual) to evaluate which backflow prevention assembly or backflow prevention method is appropriate. Such industry standards are outlined in table 2.2.1.

Reduced pressure zone backflow assemblies are required for high-risk applications, except where otherwise specifically approved in writing by the District.

SECTION II – APPROVAL, DESIGN, AND INSTALLATION

**2.2.1 Table. Assembly and method applications**

| Assembly or Method Type   | Abbreviation | Typical Appropriate Uses  |
|---|--------------|---|
| <b>Testable Assemblies</b>  |              |   |
| Reduced Pressure Zone Backflow Prevention Assembly                          | RPZ          | Appropriate for any identified contaminant except direct connections to sewer or installations which may impair the integrity of the assembly to function as designed.                            |
| Reduced Pressure Zone Fire Protection Backflow Prevention Assembly          | RPF          | Appropriate for cross connections to fire suppression systems.  |
| Reduced Pressure Zone Detector Fire Protection Backflow Prevention Assembly | RPD          |   |
| Double Check Backflow Prevention Assembly                                   | DC           | Appropriate for cross connections to fire suppression systems except when upstream of a chemical other than food grade glycerin.  |
| Double Check Fire Protection Backflow Prevention Assembly                   | DCF          |   |
| Double Check Detector Fire Protection Backflow Prevention Assembly          | DCD          |   |
| Pressure Vacuum Breaker Backflow Prevention Assembly                        | PVB          | Not appropriate for direct connections to sewer or installations which may impair the integrity of the assembly to function as designed. Not appropriate for connections subject to backpressure. |
| Spill-Resistant Vacuum Breaker  | SVB          |   |
| Colorado Plumbing Code  | CPC          | Appropriate for Backflow Prevention Assemblies or Methods installed in accordance with the most recent version of the CPC.  |
| <b>Methods</b>  |              |   |
| Air Gap   | AG           | Appropriate for any identified contaminant. All cross connections can be controlled using an air gap installed in accordance with standard AMSE A112.1.2.   |
| Block and Bleed Valve or Double Block and Bleed Valve                       | BB           | Appropriate for membrane chemical-clean-in-place and filter-to-waste at supplier's facilities.  |

Additional criteria:

- a. All valves and assembly plumbing should be approved by the local fire protection jurisdiction.

## SECTION II – APPROVAL, DESIGN, AND INSTALLATION

- b. Dry fire systems shall have an approved double check valve installed upstream of the air pressure valve.
- c. All multi-family cross connections will be controlled using a containment assembly or method.
- d. All premises with irrigation that is separate from the domestic water system must have an RPZ assembly.

### 2.3 Installation

- a. Refer to the meter assembly and vault diagrams located in Appendix B of these rules and regulations (Water and Wastewater Service Line Construction) for proper configuration.
- b. Backflow prevention assemblies shall be installed in accordance with instructions and approved designs.
- c. All backflow assemblies must be testable.
- d. All backflow assemblies and methods shall be installed in the horizontal position. Assemblies manufactured and identified for other alignments may be installed if such installations are in accordance with the design and approved by the District.
- e. A pressure type vacuum breaker shall not be used where the assembly will be subjected to back pressure and shall be installed a minimum of 12 inches above the highest piping or outlet downstream of the assembly in a manner to preclude back pressure, but no higher than 60 inches above ground level.
- f. An atmospheric non-pressure type vacuum breaker shall be used only where:
  - i. The assembly is never subjected to more than 12 hours continuous pressure;
  - ii. The assembly is installed with the air inlet in a level position and a minimum of six inches above the highest piping or outlet it is protecting; and
  - iii. No valves are installed downstream of atmospheric non-pressure type vacuum breakers.
- g. A single or a dual check valve shall not be considered to be a backflow prevention assembly.
- h. A double check valve assembly may only be installed in a below-grade vault when the vault is properly constructed in accordance with approved plans, is adequate based on the degree of hazard, and is insulated to prevent freezing.
- i. A reduced pressure backflow prevention assembly shall be used only if:
  - i. The assembly will not be submerged;

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- ii. There is a drain twice the diameter of the service to daylight;
  - iii. It is installed in a horizontal position; and
  - iv. It is installed a minimum of 12 inches and a maximum of 36 inches from the floor.
- j. Basement installations may be made where:
- i. There is a drain large enough to accommodate the maximum flow of water the assembly is capable of discharging under twice the normal static pressure for the system. Refer to flow chart in Colorado Cross Connection Control Manual, Appendix D Discharge Flow Rate;
  - ii. An acceptable high water alarm system is installed;
  - iii. There are no electrical components in the general area of the assembly;
  - iv. Only factory-supplied funnels are used to remove the periodic discharge from the assembly; and
  - v. The piping system must have an adequate Air Gap at the termination of the run.
- k. The reduced pressure backflow prevention assembly shall be kept from freezing.
- l. The assembly must be tested by a certified inspector when installed. If an assembly fails testing, it must be corrected within 60 days of the original install date.
- m. In no case is it permissible to connect the relief valve discharge on the reduced pressure assembly to a sump, drainage ditch, or other source of potential contamination.
- n. All backflow prevention assemblies shall be installed in an accessible location to facilitate maintenance, testing, and repair.
- o. All backflow prevention assemblies shall be installed downstream of the water meter. No connections shall be made between the assembly and the meter.
- p. Before installing a backflow prevention assembly, pipelines must be thoroughly flushed to remove foreign material.
- q. Test cocks shall not be used as supply connections.



## **SECTION III – TESTING AND MAINTENANCE**

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### **3.1 Testing**

A certified cross connection control technician shall test Backflow prevention assemblies within forty-eight (48) hours of turn on of the water service. Assemblies shall be tested at least annually thereafter. For high hazard applications, the district may require more frequent testing. The tests shall be made at the expense of the customer. Records of all such tests, repairs, or replacement shall be kept by the Customer and a copy shall be submitted to the District. Methods shall be inspected upon installation and annually thereafter.

The result of each test shall be submitted to the District and shall contain the following information:

- a. Assembly or method type
- b. Assembly or method location
- c. Assembly make, model and serial number
- d. Assembly size
- e. Test date
- f. Test results including all results that would justify a pass or fail outcome
- g. Certified cross connection control technician certification agency
- h. Technician's certification number
- i. Technician's certification expiration date
- j. Test kit manufacturer, model, and serial number
- k. Test kit calibration date

Testers must submit test kit certification to the District annually.

The District may test or otherwise check the installation and operation of any backflow prevention assembly at any time to assure proper operation.

The Customer's backflow prevention assembly shall be repaired or replaced at the expense of the Customer whenever the assembly is found to be defective or if the assembly fails the annual test. This repair or replacement must take place within 60 days of the original failed test. Failure to correct failed devices within 60 days may result in disconnection of water service and fines.

**3.2 Maintenance**

Backflow prevention assemblies shall be regularly inspected and maintained at a frequency deemed necessary to maintain the proper functioning of the assembly.

## **SECTION IV - SURVEYS**

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### **4.1 Customer Compliance Surveys**

The District conducts surveys to assess customer compliance with the Backflow Prevention and Cross Connection Control Program. Surveys may consist of a physical inspection or a questionnaire that the customer is required to complete and submit to the District. Authorized representatives of the District, upon presentation of a work order and identification, shall be permitted to enter upon a Customer's property at all reasonable times for the purpose of conducting a survey.

Upon receipt of a questionnaire, the Customer shall submit all of the required information and documentation as requested by the District to evaluate the existence of cross connection(s) and/or assemblies or methods, and to determine their type, adequacy, maintenance history, and any other information necessary to determine compliance with these rules and regulations and the Colorado Primary Drinking Water Regulations.

The Customer shall provide this information by the deadline indicated on the questionnaire. If the District has not received all required information by the deadline, a fine may be assessed. An additional fine may be levied for each additional month until all required information is received by the District. Water service to the Customer is subject to disconnection 60 days after the due date of the questionnaire if the District has not received the required information.

## **SECTION V - ENFORCEMENT**

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### **5.1 General Requirements**

Service of water to any premises may be discontinued by the District if a backflow prevention assembly or method required by these rules and regulations is not installed, tested, and maintained, or if it is found that a backflow prevention assembly or method has been removed, or bypassed, or if an uncontrolled cross connection exists on the premises. Service will not be restored until such conditions or defects are corrected and approved by the District. All expenses incurred by the District shall be the responsibility of the customer.

Customers may be fined per month per violation for backflow noncompliance, as indicated in Appendix A of these rules and regulations.

Failure of the Customer to install, maintain, test, inspect, repair, or replace their backflow prevention assembly or method shall be considered a violation of these Rules and Regulations and subject to Section 3.6, Violator's Liability.

Service of water to a Customer may be revoked per Article I, Discontinuance or Revocation of Service, if a cross connection is found to exist on a Customer's property. Service may also be revoked when any defect is found in an installed backflow prevention assembly, or if a backflow prevention assembly or method has been removed or bypassed. Reinstatement of service is subject to Article I, Reinstatement of Service.

## SECTION VI REFERENCES

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1. C.R.S. 25-1-114, 25-1-114.1, (Colorado Department of Public Health and Environment (CDPHE)).
2. CDPHE Regulation 11.39, Back Flow Prevention and Cross-Connection Control Guidance. Colorado Primary Drinking Water Regulations Article 14, (Hazardous Cross-Connections).
3. Water Quality Control Division-Cross-Connection Control Manual, CDPHE.
4. International Building Code.
5. Colorado Plumbing Code and/or the International Plumbing Code
6. International Swimming Pool and Spa Code.
7. "Cross-Connection Control Manual," Environmental Protection Agency (EPA) 570/9-89-007.
8. Manual of Cross-Connection Control (USC Manual)