



**WATER QUALITY CONTROL DIVISION  
SAFE DRINKING WATER PROGRAM POLICY**

<b>POLICY TITLE:</b> <b>Backflow Prevention and Cross-connection Control</b>	
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## Safe Drinking Water Program Policy Number DW-007: Backflow Prevention and Cross-connection Control

### 1.0 Purpose and Background

The purpose of this policy is to clarify the *Colorado Department of Public Health and Environment's* (Department) interpretation of Article 1-114 and Article 1-114.1 of Title 25 of the *Colorado Revised Statutes* and of Section 39 of 5 CCR 1002-11 *Colorado Primary Drinking Water Regulations* (Regulation 11).

Specifically, this policy clarifies the Department's interpretation of the following:

- Permitting an Uncontrolled Cross Connection
- Ensuring that Activities are Completed - Implementing Legal Authority
- Appropriate Assembly or Method for an Identified Contaminant
- Unacceptable Health and/or Safety Risk
- Site-specific Deviation Criteria
- Most Protective Backflow Prevention Assembly or Method
- Compliance Ratio Rounding
- Survey Process Documentation
- Public Water System's Water Supply System Cross Connections
- Extensions for Uncontrolled Cross Connections

The Department reserves the right to deviate from this policy as specified in WQCD Policy 1: Implementation Policy Framework.

### 2.0 Applicability

This policy applies to all public water systems.

### 3.0 Definitions

- a. *“CONTROLLED CROSS CONNECTION” means a cross connection that has a properly installed, maintained, and tested or inspected backflow prevention assembly or backflow prevention method that prevents backflow. (Taken from Regulation 11, Section 11.39(1)(g))*
- b. *Multi-family* means a single residential connection to the public water system's distribution system from which three or more separate living units are supplied water.
- c. *Single-family* means:
  - i A single living unit that is supplied by its own separate service line; or
  - ii Multiple living units where each individual living unit is supplied by a separate service line; or
  - iii Two separate single living units supplied by a common service line.
- d. *Water supply system* means a water distribution system, piping, connection fittings, valves and appurtenances within a building, structure, or premises. Water supply systems are also referred to commonly as premise plumbing systems.

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- e. *Extension* means an alternative schedule developed to extend the standard regulatory deadline of 120-days for controlling discovered uncontrolled cross-connections.
- f. *Discovery of an uncontrolled cross connection* means when the supplier discovers a cross connection through surveying or when the supplier is notified of an uncontrolled cross connection.

### 4.0 Policy Statement

#### 4.1 Clarification on regulatory intent of the phrase “installing or permitting any uncontrolled cross connection”

In order to align with applicable state statute, Regulation 11, section 11.39(3) states that the supplier of water is prohibited from installing or permitting any uncontrolled cross connection. The concept of prohibition from installing or permitting an uncontrolled cross connection directly relates to the supplier’s actions once the supplier discovers an uncontrolled cross connection - see definition of discovery of an uncontrolled cross connection.

Uncontrolled cross-connections are those that do not have a properly installed, maintained, and tested backflow prevention assembly or method. Uncontrolled cross connections include:

- Identified cross connections where no assembly or method has been installed.
- Connections where an inadequate type assembly or method has been installed for the cross connection identified.

Examples: A double check is installed at a cross connection utilizing chemicals; when chemicals are utilized a RP or air gap must be utilized.

A pressure vacuum breaker that is installed at a connection subject to back pressure.

- Cross connections where an assembly or method has been installed incorrectly.

Examples: Improper orientation - an assembly is installed vertically, however it is only approved for horizontal installation.

Location of assembly - an RP installed in a pit or vault without adequate drainage where it could become submerged.

- An assembly with a failed test.

While failed tests occur, they are considered uncontrolled cross connections because the assembly is not functioning as intended and as

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long as it remains in a failed state it is not providing adequate protection of the distribution system.

- Assemblies not tested and methods not inspected during the two most recent calendar years.

For the purpose of this rule, any assembly or method that is providing protection of the public water supply must be tested or inspected annually. It becomes an uncontrolled cross-connection when the assembly or method has not been tested or inspected within the previous two years. It is not appropriate to extend the deadline an additional 120 days and these automatically become a treatment technique violation after two years. Treatment technique violations require Tier 2 Public Notice per Regulation 11.

Installing means modifications or additions to waterworks or water supply systems that create an uncontrolled cross connection. In this case, the supplier is prohibited from intentionally performing any actions which would result in the creation of an uncontrolled cross connection.

Permitting an uncontrolled cross connection in the context of Regulation 11, section 11.39(3) means the supplier has allowed their users or customers to continue to have an uncontrolled cross connection past the regulatory-defined timelines.

Any uncontrolled cross-connection, including connections with an assembly that failed a test, must be resolved within 120 days of the supplier discovering the uncontrolled cross connection. The following actions are considered a resolution to the uncontrolled cross-connection. Failure to resolve the uncontrolled cross-connection in the regulatory timeframes or according to an extension is allowing, or permitting, the cross-connection to exist and is a violation of Regulation 11.

- a. The supplier is in compliance with Regulation 11 if the supplier completes one of the following actions within 120 days of discovering an uncontrolled cross connection:

- i. Controls the cross connection.

The supplier ensures that an appropriate assembly or method is installed and tested or inspected for the identified cross connection.

- ii. Removes the cross connection.

The supplier ensures that the cross connection has been physically removed or disconnected from the water system.

- iii. Suspends service to the connection.

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Suspension of service means suspending or shutting off the water supply to a customer connection. Suspension of service must be under the control of the supplier and the customer cannot have the ability to restore service without contacting the water system (ie. - winterization of an irrigation by the customer is not suspension of service since the customer is able to repressurize the system on their own).

If service is suspended due to a customer not testing their backflow assembly, this assembly must still be included in the supplier's annual report as an assembly that was not tested during the calendar year. Suspending service controls a cross connection by removing it from the water system, however it is not a substitute for testing a backflow assembly. When suspension of service is used for not testing a backflow assembly or a failed test, the assembly must be tested in order to restore service. The supplier may restore service to allow for an assembly to be tested within a reasonable timeframe prior to the test; however, it is expected that the supplier follow up with the customer to ensure the assembly was tested.

If suspension of service was used to control the identified cross connection, the supplier must ensure the assembly or method has been installed and tested prior to restoring service. The supplier must document the protocol for verifying installation of the assembly prior to restoring service. Also, the protocol must include how and when service will be restored to allow for the testing of a newly installed assembly.

Before suspension of service can be considered an appropriate action the Department expects that the supplier will confirm the following:

1. The connection downstream of the valve used to suspend the service does not remain pressurized because the customer has access to an alternative source of water or a storage tank onsite.
2. If the cross connection is a fire suppression system, notification has occurred to the local fire department, dispatch, and building officials in order to help the appropriate entities evaluate whether the building is adequately protected from loss of life. Local agencies may have additional requirements and restrictions regarding fire suppression lines.
3. Confirm the cross connection is not located at the supplier's waterworks; suspension of service is not permitted for cross connections within the supplier's waterworks. The cross

connection must be controlled or removed within the supplier's waterworks. Example: If the supplier has a backflow prevention assembly on their in-house or chemical supply water line at their water treatment plant that has not been tested, they cannot 'suspend service' to that connection. They must test the assembly within 120 days or a deadline specified in an extension.

- iv. Documents an extension in conformance with Section 4.11 of this policy.
- b. After 120 days, the supplier is only in compliance with Regulation 11 if the supplier is following an extension in accordance with Section 4.11 of this policy.

#### 4.2 Failed Assemblies

- a. When an assembly fails a test, this indicates that the assembly is not operating as intended and needs to be repaired or replaced. An assembly with a failed test is no longer properly maintained which meets the definition of an uncontrolled cross connection.
- b. The number of failed assemblies for a given calendar year is expected to be reported in the annual report as an uncontrolled cross connection.
  - i. When an assembly fails a test and then is repaired on the same calendar day and passes the subsequent test, the supplier may exclude reporting the said assembly as having failed in the annual report. Suppliers must still maintain all backflow prevention assembly testing and maintenance records as required in Regulation 11, section 11.36(4)(l)(i).
- c. The supplier has 120 days from the date of being notified of a failed test to ensure the assembly is repaired, replaced or removed. In order to facilitate this, the supplier should be tracking the following information when an assembly fails a test:
  - i. Date of failed assembly test.
  - ii. Date of notification of the failed test.
  - iii. Date of passing retest.

4.3 Ensuring that Activities are Completed - Implementing Legal Authority

- a. Regulation 11, section 11.39(2)(a)(vi) refers to the “process the supplier will use to ensure backflow prevention assemblies are tested by a Certified Cross-Connection Control Technician”. The Department will determine the adequacy of a supplier’s process to ensure that testing has been completed by a certified professional. Typically, the supplier of water is in compliance with section 11.39(2)(a)(vi) of Regulation 11 if the supplier does the following:
  - i. The supplier has a documented process in place where the supplier receives a test report directly from the Certified Cross-Connection Control Technician or their associated company.
  - ii. To be considered adequate, test reports used to document compliance with Regulation 11 must include enough details to clearly delineate and differentiate between assemblies and methods within the distribution system. Typically, all of the following information is sufficient although all may not be available at every installation:
    1. Assembly or method information:
      - A. Assembly or method type;
      - B. Assembly or method location;
      - C. Assembly make, model and serial number;
      - D. Assembly size;
      - E. Test date; and
      - F. Test result (pass/fail).
    2. Certified Cross-Connection Control Technician information:
      - A. Certified Cross-Connection Control Technician certification agency;
      - B. Certification number; and
      - C. Certification expiration date or statement that certification is current.
      - D. As an alternative to A-C, suppliers may provide documentation of an alternative validation process such as electronic login to reporting software where only current, certified cross connection control technicians (or their companies) are given a login.

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- b. Regulation 11, section 11.39(2)(a) outlines the written backflow prevention and cross-connection control program. Within the requirements of the written program, sections 11.39(2)(a)(ii, iv) refers to the suppliers of water legal authority. The Department will evaluate whether the supplier is appropriately implementing its legal authority.
- c. The phrase “the supplier must ensure” is used in Regulation 11 sections 11.39(3)(c)(i)(C), 11.39(3)(c)(i)(D), 11.39(3)(d), 11.39(3)(d)(i), 11.39(3)(d)(ii), 11.39(3)(d)(iii), 11.39(3)(d)(iv) and 11.39(3)(e). The supplier of water is in compliance with the above referenced sections if the supplier does either of the following:
  - i. Using the supplier’s legal authority, the supplier requires the customer to take all actions necessary to complete the indicated regulatory requirement(s);
    - 1. In establishing the supplier’s legal authority, the supplier must have a legally-enforceable mechanism that implements its written backflow prevention and cross connection control program as described in 11.39(2). The Department recommends that the legally-enforceable mechanisms include specific provisions identifying customer requirements under 11.39(2)(a)(ii, iv) and the associated remedies that the supplier may utilize for failure of customer(s) to comply. Examples of legally enforceable mechanisms include, but are not limited to, user agreements, city/town ordinances, and other written contracts.
  - ii. The supplier performs the actions necessary to complete the indicated requirement(s) in the regulation.
    - 1. If the supplier does not have a legally-enforceable mechanism in place, the Department expects the supplier to perform the actions necessary to complete the indicated requirements in the regulation.

### 4.4 Appropriate Assembly or Method for an Identified Contaminant

- a. The Department uses industry standards outlined in manuals such as the *Colorado Cross-Connection Control Manual*, the *EPA Cross-Connection Control Manual* and the *10th Edition Manual of Cross-Connection Control* (USC Manual) to evaluate whether the installation of a backflow prevention assembly or backflow prevention method is appropriate. Such industry standards include:

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Table 1: Industry Standard Assemblies and Methods for Specific Uses

Assembly or Method Type	Abbreviation	Typical Appropriate Uses (Note: see also Section 4.5 Site Specific Deviation Criteria)
<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	Appropriate for any identified contaminant except 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 ASME A112.1.2.
Atmospheric Vacuum Breaker	AVB	Appropriate for any identified contaminant except direct connections to sewer or installations which may impair the integrity

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Assembly or Method Type	Abbreviation	Typical Appropriate Uses (Note: see also Section 4.5 Site Specific Deviation Criteria)
		of the assembly to function as designed. Not appropriate for connections subject to backpressure and must not have a valve installed downstream.
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.
Check Valve	CV	The Department will determine if these methods are appropriate.
Hydraulic Conditions	HC	

**4.5 Unacceptable Health and/or Safety Risk**

Unacceptable health and/or safety risk can be biological, chemical, radiological or physical in nature. Risks to human health are assessed by the level of acute or toxic potential. An example safety risk from cross connections includes risks of injury from explosion when a natural gas cross connection has occurred.

Industrial, commercial and multi-family connections can present an unacceptable health and/or safety risk to the distribution system because of the nature of the activities that take place at the site and the magnitude or volume of potential contamination. Supplier's are expected to evaluate these types of connections through the surveying process for the purposes of identifying cross-connections.

Waterworks and domestic wastewater treatment works are considered industrial facilities for the purposes of identifying cross connections. The public water system's distribution system must be protected from the in-plant water supply of the waterworks as necessary.

Single-family-residential connections pose a relatively low risk to the distribution system based on the volume of water contained in the plumbing system. Local plumbing codes, which are enforced by the local jurisdiction having authority over plumbing within residential structures, are in place to protect private residences from typical residential cross connections. If the local jurisdiction having authority requires that a backflow prevention assembly or backflow prevention method be installed, it is generally the responsibility of the homeowner to maintain the assembly or method. Backflow from connections to the following are typically considered an unacceptable health and/or safety risk:

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- a. For commercial, industrial and multi-family service connections
  - i. Dry cleaning and laundries;
  - ii. Mortuaries;
  - iii. Hair salons;
  - iv. Laboratories;
  - v. Auto repair shops;
  - vi. Car washes;
  - vii. Bulk fill water stations;
  - viii. Restaurants;
  - ix. Hospitals, dental facilities, medical facilities and clinics, and blood banks;
  - x. Veterinary, pet stores, and livestock facilities;
  - xi. Manufacturing facilities;
  - xii. Green houses and agricultural commerce;
  - xiii. Temporary water and construction connections;
    1. Suppliers must inventory and track assemblies or methods that will be used for temporary water use (ie. fire hydrants for construction). A single test or inspection per year on such assembly or method is considered acceptable. These connections are not required to be included in the survey reporting, but they are required to be included in all other applicable reporting requirements.
  - xiv. Other commercial and industrial service connections.
- b. Plumbing arrangements/systems at commercial, industrial and multi-family properties
  - i. Fire suppression systems;
  - ii. Irrigation systems including dedicated irrigation connected directly to the water main;
  - iii. Chemical process systems, including chemicals connected for temporary maintenance;
  - iv. Hydronic heating and cooling systems, industrial boilers, chillers, cooling towers, double wall heat exchangers and solar thermal panels; and

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1. Suppliers may determine whether multi-family residential or small commercial boilers constitute a similar health/safety risk as single-family residential boilers
- v. Auxiliary water sources, display fountains, hot tubs, pools, reclaimed water systems, graywater systems and onsite storage tanks.

### c. For single-family residential connections

There are types of cross connections at single-family-residential connections that may pose a greater risk than those addressed by local plumbing codes enforced by the local jurisdiction authority. If these types of cross-connections are discovered, they must be included in the supplier's backflow program and annual reports. These types of cross-connections include but are not limited to:

- i. Dedicated irrigation lines connected directly to the water main;
- ii. Fire suppression system lines and chemically enhanced fire suppression systems;
  1. Multi-purpose and passive purge fire suppression systems are not required to be controlled where each branch of the suppression system terminates at a regularly used fixture;
- iii. 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 (cisterns); and
- iv. 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.

### d. For connections within the supplier's waterworks

Any identified cross connections within such facilities must be controlled in accordance with the *State of Colorado Design Criteria for Potable Water Systems* and with the use of an appropriate backflow prevention assembly or method shown in Table 2. Alternatively, a site-specific deviation may be approved by the Department.

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**Table 2: Appropriate Backflow Prevention within Suppliers' Waterworks**

<b>Cross Connection</b>	<b>Appropriate Backflow Prevention Assembly or Method</b>
Filter to waste line to waste collection system	AG, BB, DC, RPZ
Clean in Place Connection	BB
Surface Wash	AG, PVB, SVB, RPZ
Subsurface Wash	AG, PVB, SVB, RPZ
Chemical Feed System	DC, RPZ
Irrigation Sprinkler	CPC, PVB, SVB, RPZ
Non Potable Water	AG, PVB, SVB, RPZ
Water Loading Stations	AG, PVB, SVB, RPZ
Connections to waste collection systems (sediment removal)	AG, RPZ,
Bypasses to treatment	Case by Case (Addition of chemical disinfectant, coagulation and filtration must not be bypassed)
Fire Suppression Systems	DC, DCD, DCF, RP, RPD, RPF,
In-Plant Water Supply	AG, RPZ
Filtered or Finished Water	AG, RPZ

#### 4.6 Site-specific Deviation Criteria

- a. The supplier of water may develop site-specific deviation criteria if the supplier determines that the installation of an alternative backflow prevention assembly or backflow prevention method is appropriate for the identified contaminant, or that a lower protective backflow prevention assembly or backflow prevention method can be installed due to more frequent testing and/or inspections.
  - i. Site-specific deviation criteria and modifications are subject to review and modification by the Department.
  - ii. Site-specific deviation criteria may address situations where the assembly or method is installed in accordance with the local jurisdictional plumbing code or instances when the installation of an air gap or where the supplier considers that the RPZ retrofit would create an unreasonable burden. Examples of such situations include but are not limited to when the location of the assembly installation is in an area where there is not adequate drainage for an RPZ or the assembly is subject to flooding.
  
- b. A supplier of water may determine, during the survey process, that a multi-family residential connection poses a similar risk to the distribution system as a typical single-family residence. The supplier may develop site-specific deviation criteria to designate specific multifamily residential connections as equivalent to a single-family residence connection for the purposes of backflow prevention
  - i. Site-specific deviation criteria and modifications are subject to review by the Department.
  - ii. The site-specific deviation criteria should consider tap size, volume of water in the plumbing system and compliance with local plumbing codes for irrigation systems.
  - iii. The supplier must document where site-specific deviation criteria is applied.

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- c. All deviations are subject to review by the department. If a supplier intends to install an assembly or method that is not specified in sections 4.3 or 4.4 of this policy - the department recommends that the supplier submit proactively to ensure the department agrees with the deviation. Two specific control measures, hydraulic conditions and check valves, must be approved by the department in advance. When the department performs a review of site-specific deviations, the supplier is expected to provide documentation demonstrating that the proposed alternative assembly or method is equally protective against backflow and backsiphonage. The supplier is expected to consult with the department to determine what information is needed to evaluate the site-specific deviation. Information demonstrating the proposed deviation is sufficient may include, but is not limited to:
  - i. An explanation of the cross connection identified and why the standard backflow assembly or method cannot be utilized
  - ii. An explanation demonstrating why the proposed alternative assembly or method would be protective of the identified cross connection
  - iii. Calculations demonstrating that backflow and backsiphonage cannot occur under all conditions, if proposing hydraulic conditions
  - iv. Elevation information, if proposing a barometric loop
  - v. Confirmation that the proposed alternative assembly or method meets the standards of the local plumbing code as applicable.

### 4.7 Most Protective Backflow Prevention Assembly or Method

Regulation 11, section 11.39 requires the supplier of water to perform a survey of any non-single-family-residential connections in the distribution system if the most protective backflow assembly or method is not used at that connection. The following are acceptable “most protective backflow prevention assemblies or methods”:

- a. Method - air gap installed in accordance with standard ASME A112.1.2.
- b. Assembly - reduced pressure zone backflow prevention assembly.

4.8 Compliance Ratio Rounding

- a. For compliance ratios listed in Regulation 11, section 11.39, appropriate rounding for the compliance ratios are described below:
  - i. For compliance ratios with a listed requirement of “Greater than or equal to 0.XX”, the compliance ratio must be greater than or equal to the listed ratio for that year and rounding to the nearest hundredth is appropriate. For example, if the compliance ratio required for a given year is 0.90 and you calculate a survey compliance ratio of 0.893 for that year, then the survey compliance ratio would be 0.89 and thus out of compliance for that year. On the other hand, if you calculate a survey compliance ratio of 0.896, the compliance ratio would be 0.90 and would be in compliance for that year.
  - ii. When the survey compliance ratio is required to be 1.0, then rounding to the nearest tenth is appropriate. For example, a survey compliance ratio of 0.951 would round to 1.0 whereas a survey compliance ratio of 0.947 would round to 0.9 and would not meet the listed survey compliance ratio. Suppliers of water are still required to work toward 100% survey compliance regardless of the rounding.

4.9 Survey Process Documentation

- a. Documentation of the Supplier’s Survey Process/Procedures

Regulation 11 requires the supplier of water to document the supplier’s process for conducting surveys. Acceptable survey process documentation includes the following:

- i. How the supplier will select service connections that need a survey; for example:
  - 1. Usage type - commercial, industrial, or multi-family;
  - 2. New or newly acquired connections; and/or
  - 3. Questionnaire results.
- ii. How the supplier will select individuals to perform the survey including experience and/or training or certification qualifications to perform a survey; and
- iii. Written and/or verbal questionnaire standards (if used).
  - 1. The Department expects that the questionnaires provide examples of common cross connections to the customer who completes the survey.

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2. Questionnaires may be written, verbal, or web-based and should have the property-owner indicate that the information is accurate to the best of their knowledge.
  - A. If the supplier does not receive a response to a questionnaire or the results are inconclusive, the supplier is required to perform an onsite survey for cross connections or control the connection with the most protective backflow prevention assembly or method.
- b. Initial Surveying

Suppliers must survey all non-single-family residential connections, including the supplier's waterworks to determine if a cross connection is present. The supplier is expected to keep documentation recording the results of the survey for each connection. Documentation will vary depending on the survey process chosen by the supplier, but may include:

- i. Survey form completed by the water system from onsite survey
- ii. Survey form from third party contractor from onsite survey
- iii. Survey questionnaire completed by the customer
- iv. Demonstration that the most protective assembly or method is in place.

Suppliers are not required to survey single-family residences; however, if a supplier becomes aware of a cross connection at a single-family residence they are expected to follow up with the customer to have the cross connection removed or protected.

Temporary water and construction connections that utilize an assembly or method to control cross connections are not subject to the surveying requirement of Regulation 11. However an inventory of the control assemblies and methods must be maintained by the supplier.

### c. Resurveying

Once non-single-family-residential connections and supplier waterworks connections have been surveyed for cross connections, that connection is considered surveyed for that year and all subsequent years unless resurveying is required as outlined below.

- i. Resurveying a connection is required when the supplier becomes aware that the water use at a connection within the water supply system has changed and the most protective assembly or method is not already being utilized. Resurveying is required to determine:
  1. If new cross connections have been introduced.
  2. If any new cross connections are adequately protected or need a new assembly/method.

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- ii. If change of use notifications are processed by personnel outside of the backflow department, the supplier must document how they will be notified when a change of use occurs at a connection. For example, the retail food/liquor license process includes a step to notify the water supplier to ensure any installed backflow prevention assemblies are adequate for the contamination risk.
- iii. When a connection is identified for a resurvey, that connection is considered unsurveyed in the survey ratio. If a connection is identified for resurvey after October 31 of the calendar year it is not required to be included in the total number of connections in the survey ratio.
  - 1. If a connection is considered unsurveyed and is not surveyed in a reasonable amount of time, it may result in a significant deficiency during department review. An unsurveyed connection that goes multiple calendar years without being surveyed is considered an unreasonable amount of time.
- iv. The supplier is expected to maintain documentation of the results of the survey.

### 4.10 Public Water System's Water Supply System Cross Connections

Non-community public water systems and community water systems located on one entire property that contain water supply systems are subject to the following survey and cross connection control requirements:

- a. Generally, if the water supply system is owned by the supplier of water, then all cross connections within the water supply system must be protected from backflow. In this case, the water supply system is part of the distribution system for the purposes of identifying cross connections.
- b. The survey requirement in Regulation 11, section 11.39(3)(c) applies to the water supply system. At a minimum, identified cross connections must be controlled in accordance with the Colorado Plumbing Code. All backflow prevention assemblies and methods used to control cross connections must be tested or inspected and maintained as specified in Regulation 11.

#### 4.11 Extensions for Uncontrolled Cross Connections

When the supplier discovers an uncontrolled cross-connection (no assembly/method, inadequate assembly/method, or an assembly that failed a test) an extension may be developed by the supplier to extend the 120-day timeline. For situations meeting the criteria specified in this section (4.11), the supplier can develop and implement an extension and is not required to consult with the department. While meeting the criteria within this section, the extension constitutes a Department-approved alternative schedule as specified in Section 11.39 of Regulation 11.

All supplier extensions must have a reasonable justification for why the extension should be issued. For situations not specified in this section, the supplier must consult with the Department for a written-approval of the extension.

While the department is allowing suppliers to develop extensions where necessary, the department supports supplier's decisions to not grant extensions when the supplier feels the standard 120-day timeline is appropriate. The department will not issue extensions to individual users that disagree with the supplier's decision.

Any uncontrolled cross-connection that has a supplier extension or a department approved extension is not considered controlled until an assembly/method has been installed and tested, assembly/method has been repaired/replaced and tested, the cross-connection has been removed, or service has been suspended. All uncontrolled cross-connections that are within the 120-day timeline or have an extension should be tracked in accordance with Regulation 11, Section 11.39(4)(a)(v)(C).

##### a. Supplier extensions

##### i. Categories of supplier extensions

##### 1. Large assemblies

For service lines 6 inches or larger that require substantial installation and planning.

##### 2. Change in site owner/manager/contact

Communication difficulties due to change in ownership or site personnel.

##### 3. Resource issues

For issues related to delays caused by availability of required resources such as parts, certified tester, or plumber.

##### 4. Complex or inadequate installations and/or repairs

For complex installations and/or repairs (ie fire suppression systems) that require additional steps in the design, review and installation process or when access is difficult. Or for inadequate installations and/or repairs (ie RP in pit).

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### 5. Economic hardships/financial approval process

For situations where financial resources are not reasonably available or where financial approval of funding is required.

### 6. Other

For other situations not listed that are still considered to have a reasonable justification for why the extension should be issued. Details about why the situation is reasonably justified must be documented.

## ii. Limitations for supplier extensions

If a situation goes beyond any of the limitations listed below for any individual uncontrolled cross-connection, the supplier can no longer utilize a supplier extension and they must consult with the Department and the Department can approve extensions case-by-case.

1. Supplier's must develop, implement and document a supplier extension no later than the original regulatory timeline of 120-days from the date the supplier discovers the cross-connection.
2. Supplier extensions must include a target install and test date as soon as practical as determined by the supplier. The install and test date must be within 12 months from the date the supplier discovers the cross-connection or the supplier must consult with the department to receive approval.
3. Compliance timeframes with regard to testing or inspection of assemblies/methods are not eligible for extensions. No assembly/method can be utilized for more than two consecutive calendar years without being tested or inspected, suspension of service, or the cross-connection being removed.
4. For categorical extensions, suppliers must consult with the department and receive approval (see section 4.11.c below).
5. For any discovered uncontrolled cross-connections related to a direct connection to sewer, the supplier must notify and consult with the department no later than 48 hours after discovery.
6. If the supplier learns of a suspected or confirmed backflow contamination event, the supplier must notify and consult with the Department on any appropriate corrective measures no later than 24 hours after learning of the event.

## iii. Guidelines for developing and implementing supplier extensions

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1. Suppliers shall make a reasonable effort to control discovered uncontrolled cross-connections within the 120-day timeline. If there is reasonable justification for why the supplier is unable to comply with the 120-day timeline, the supplier can begin the process of developing, implementing and documenting a supplier extension.
  2. For situations eligible for supplier extensions, supplier's are required to adequately track and document all necessary information for each individual uncontrolled cross-connection that receives a supplier extension.
  3. The owner or person responsible for controlling the discovered uncontrolled cross-connection should be cooperative and give reasonable assurances that work will be completed by the proposed timelines.
  4. Suppliers shall develop an escalation and enforcement process that includes internal deadlines and a plan for non-compliance (i.e. suspension of service). The escalation and enforcement process should be adequately documented and incorporated into the suppliers BPCCC program. Common and acceptable escalation techniques are summarized in section 4.12 below.
- iv. Documentation requirements

For each individual uncontrolled cross-connection that receives a supplier extension, the supplier must track and document all necessary information including but not limited to the following information;

1. Type of extension (no assembly/method, inadequate assembly/method, or an assembly that failed a test)
2. Date of discovery
3. Location/address
4. Owner/Property Manager/Site Contact
5. Service connection type and/or identified contaminant.
6. Reasonable justification for why the supplier and/or the customer are unable to comply with the 120-day deadline
7. Proposed and achieved action for compliance (Installed assembly/method, repair/replace and testing of assembly/method, removal of cross-connection, suspension of service)
8. Proposed control date

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9. Date controlled (ie passing test date, date removed, or date service was suspended)

b. Department approved extensions

For situations not specified in section 4.11(a) above, the supplier must consult with the Department for approval of an extension.

- i. "CONSULT WITH THE DEPARTMENT" means submitting information in writing about the situation and may include phone calls
- ii. For situations where the supplier is required to consult with the department for an extension, the supplier is required to submit all necessary information. The department will review all available information and issue either an approval letter or a compliance advisory requesting additional information.

iii. Process for extensions that cannot be approved

1. If a supplier submits a request for an extension that cannot be approved, the Department will issue a compliance advisory communicating why the extension cannot be approved and request additional information if applicable. The supplier will be given an additional 30 days from the date of the compliance advisory to submit information. If the supplier is not able to provide adequate information or if the extension cannot be approved, it may result in a violation of Regulation 11 that may require Tier 2 public notice. If a violation occurs, it will be communicated to the supplier in a separate letter.

c. Categorical extensions

For qualified scenarios where a supplier requests a general extension for cross-connections of a specific category that have yet to be identified, suppliers can consult with the department for a categorical extension. The department will review all available information and issue either an approval letter or a compliance advisory requesting additional information.

### 4.12 Acceptable Escalation Techniques

Below are examples of common escalation tools used by suppliers to encourage customers to install, test or maintain backflow assemblies or methods and considerations when using them. Escalation tools are not limited to those listed below and suppliers are not required to utilize these tools. These tools aid in the installation or testing of backflow assembly or method but do not replace the testing requirements in Regulation 11 Section 11.39.

a. Warning Letters

Often used as the first step to the above compliance options. A supplier may issue a series of letters notifying a customer that their assembly is due to

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be tested and what actions would occur if they do not comply (water shut off, fines, etc.)

- b. Fines
  - i. Some suppliers issue fines to customers who do not comply with backflow requirements. A fine is a sum of money which a customer is required to pay the supplier as penalty for not complying with the installation, maintenance or testing requirements. Examples include:
    - 1. A set, one time fine issued to the customer after they pass the deadline for installation or testing.
    - 2. A tiered fine system that increases based on how far past the deadline the customer is.
- c. PWS provides certified cross control technicians

Some suppliers have access agreements with certain customers (e.g. public schools) and provide testing services of the backflow assemblies for a fee and surcharge if the entity chooses or is unable to get the assembly tested by the deadline. Others however, have expressed that because of liability concerns, their policy is not to have staff enter another property. Each supplier must make its own decision about liability and entering premises, however if a supplier of water does perform the testing, then the requirements of the rule are met.

Suppliers have also completed the testing by using their own technicians or contractors with the addition of a fee if the customer does not complete the testing by the due date. This fee can be large enough to discourage the customer from using this service regularly.

NOTE: the practice of entering a customer's property is not dissimilar from lead and copper rule monitoring or customer complaint response. The department is aware of multiple suppliers that perform the lead and copper rule sampling by entering a customer's home to grab the sample. Conversely, other systems have policies where staff are prohibited from entering a customer's premises. The department is not encouraging one arrangement over another but rather making suppliers aware of compliance options.

- d. Suspension of Service (i.e. Shutoffs)

For untested fire suppression systems and if there are service connections at the property separate from the uncontrolled fire suppression system cross connection, a supplier may suspend service to one or all of those other service lines (e.g. domestic or irrigation) as an appropriate alternative escalation tool to suspending the fire suppression service. Note, this escalation tool does not constitute compliance with Regulation 11.39.