



Services of the San Francisco
Public Utilities Commission

San Francisco Public Utilities Commission

Cross-Connection Control Plan and Program Manual

**Water Quality Division
August 14, 2025**

PREPARED FOR THE SFPUC BY

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A JOINT VENTURE

**CROSS-CONNECTION CONTROL PLAN AND PROGRAM MANUAL
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Preface

This Cross-Connection Control Plan and Program Manual (Manual) documents the City and County of San Francisco's (CCSF's) compliance with the requirements of the California State Water Resources Control Board's Cross-Connection Control Policy Handbook (CCCPH), which became effective on July 1, 2024. The Manual also provides guidance to CCSF staff, contractors, backflow prevention assembly testers, building owners, and other stakeholders regarding cross-connection control practices mandated by federal, state, and local laws and regulations. Under the San Francisco Charter, the authority and responsibility for managing and operating CCSF's public water system is vested in the San Francisco Public Utilities Commission (SFPUC). The General Manager of the SFPUC has designated the Director of Water Quality Division (WQD) of the SFPUC to address cross-connection control issues. WQD is the entity responsible for administering CCSF's Cross-Connection Control Program.

This Manual is a living document that will be updated as necessary. Its guidance regarding CCSF's Cross-Connection Control Program is intended for informational purposes only and does not, itself, set applicable standards or requirements governing cross-connection controls or backflow prevention into CCSF's water systems. In the event there is any discrepancy or conflict between the contents of this Manual and any provision of applicable laws or regulations governing cross-connections and backflow prevention, including, but not limited to, Article 12A of the San Francisco Health Code, Section G of the SFPUC Rules and Regulations Governing Water Service to Customers, or the CCCPH, the standards and requirements in those laws and regulations shall govern.

This Manual covers all of the SFPUC's permitted and/or managed water systems, listed below.

Community water systems:

- San Francisco Water System, #3810011
- San Francisco Regional Water System, #3810001
- Treasure Island Water System, #3810702
- Town of Sunol Water System, #0110012
- Pleasanton Well Field Water System, #0110018
- Thomas Shaft Wholesale Water System, #3810068
- Moccasin Compound Water System, #3810003

Noncommunity water systems:

- Early Intake Compound Water System, #3810006
- O'Shaunessy Compound Water System, #3810005

SFPUC Cross-Connection Control Program

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Definitions

The definitions below are from Chapter 3, Article 1, of the California Cross-Connection Control Policy Handbook, unless otherwise indicated. Notes are in Section 23, References Cited

Air Gap separation (Air Gap): A physical vertical separation of at least two (2) times the effective pipe diameter between the free-flowing discharge end of a potable water supply pipeline and the flood level of an open or non-pressurized receiving vessel, and in no case less than one (1) inch.

Approved water supply: A water source that has been approved by the State Water Board for domestic use in a public water system and designated as such in a domestic water supply permit issued pursuant to section 116525 of the California Health and Safety Code.

Authorized Backflow Prevention Assembly Tester (Authorized Tester)¹: Any person who possesses a valid certification to test, repair and maintain backflow prevention assemblies and is authorized by the General Manager to do such work in San Francisco in accordance with Article 12A of the San Francisco Health Code.

Authorized Cross-Connection Control Specialist (Authorized Specialist)¹: Any person who possesses a valid certification to administer a cross-connection control test and to conduct site surveys to assess cross-connection control requirements and is authorized by the General Manager to do such work in San Francisco in accordance with Article 12A of the San Francisco Health Code.

Authorized Representative: A person designated by a company employing Authorized Testers or Authorized Specialists to obtain backflow tags on behalf of the company.

Auxiliary water supply: A source of water, other than an approved water supply, that is either used or equipped, or can be equipped, to be used as a water supply and is located on the premises of, or available to, a water user. This category includes, but is not limited to, recycled water, wastewater, graywater, groundwater and rainwater. This category also includes alternate source water systems regulated under Article 12C of the San Francisco Health Code.

Backflow: An undesired or unintended reversal of flow of water and/or other liquids, gases, mixtures or other substances into a public water system's distribution system or approved water supply.

Backflow Prevention Assembly (BPA): A mechanical assembly designed and constructed to prevent backflow, such that while in-line it can be maintained and its ability to prevent backflow, as designed, can be field tested, inspected and evaluated.

Backflow prevention assembly tester: A person who is certified as a backflow prevention assembly tester.

Containment²: Protection of the public water system's distribution system from backflow from a user's premises through the installation of one or more air gaps or BPAs, installed as close as practical to the user's service connection, in a manner that isolates the water user's water supply from the public water system's distribution system.

Contamination³: Impairment of the quality of the water in such a way as to create an actual hazard to the public health through poisoning, the spread of disease, etc.

Cross-Connection: Any actual or potential connection or structural arrangement between a public water system, including a piping system connected to the public water system and located on the premises of a water user or available to the water user, and any source or distribution system containing liquid, gas, or other substances not from an approved water supply.

Cross-connection control specialist: A person who is certified as a cross-connection control specialist.

Customer²: The person that receives water service from the SFPUC at a property and is listed as the customer of record for the property in the SFPUC Customer Service Bureau database.

Double-check detector backflow prevention assembly (DCDA): A DC that includes a bypass with a water meter and DC, with the bypass's water meter accurately registering flow rates up to two gallons per minute and visually showing a registration for all rates of flow.

Double-check detector backflow prevention assembly type II (DCDA-II): A DC that includes a bypass around the second check, with the bypass having a single check valve and a water meter accurately registering flow rates up to two gallons per minute and visually showing a registration for all rates of flow.

Double-check valve backflow prevention assembly (DC): A Backflow Prevention Assembly consisting of two independently acting, internally loaded check valves, with tightly closing shutoff valves located at each end of the assembly (upstream and downstream of the two check valves) and fitted with test cocks that enable accurate field testing of the assembly.

General Manager²: The General Manager of the San Francisco Public Utilities Commission, or any individual designated by the General Manager to act on his or her behalf. The General Manager has designated the Director of the Water Quality Division of the San Francisco Public Utilities Commission to act on his behalf to address cross-connection control issues. The Director of the Water Quality Division may further designate individuals to address cross-connection control issues.

Graywater⁴: Untreated wastewater that has not been contaminated by any toilet discharge, that has not been affected by infectious, contaminated, or unhealthy bodily wastes and does not present a threat from contamination by unhealthful processing, manufacturing, or

operating wastes. Graywater includes wastewater from bathtubs, showers, bathroom washbasins, clothes washing machines, and laundry tubs but does not include wastewater from kitchen sinks or dishwashers.

Isolation³: The appropriate type or method of backflow prevention within a customer's potable water system at the point of use, commensurate with the degree of hazard.

Manual: This Cross-Connection Control Plan and Program Manual.

Point of connection²: A customer's water meter for all SFPUC-provided water services, except for dedicated fire services, for which the point of connection is the junction of the SFPUC water supply lateral and the customer's fire protection system.

Pollution³: An impairment of the quality of water to a degree that does not create a hazard to the public health but that does adversely and unreasonably affect the aesthetic qualities of such waters for domestic use.

Pressure vacuum breaker backsiphonage prevention assembly (PVB): An assembly with an independently acting internally loaded check valve and an independently acting loaded air inlet valve located on the discharge side of the check valve with test cocks and tightly closing shutoff valves located at each end of the assembly that enable accurate field testing of the assembly.

Public water system (PWS): The same meaning as defined in section 116275(h) of the California health and safety code.

Recycled water: Wastewater that, as a result of treatment, is suitable for uses other than potable use.

Reduced pressure principle backflow prevention assembly (RP): A backflow prevention assembly with two independently acting, internally loaded check valves, with a hydraulically operating, mechanically independent differential-pressure relief valve located between the check valves and below the upstream check valve. The assembly shall have shutoff valves, located upstream and downstream of the two check valves, and test cocks to enable accurate field testing of the assembly.

Reduced Pressure Principle Detector Assembly (RPDA): An RP that includes a bypass with a water meter and RP, with the bypass's water meter accurately registering flow rates up to two gallons per minute and visually showing a registration for all rates of flow.

Reduced Pressure Principle Detector Assembly Type II (RPDA-II): An RP that includes a bypass around the second check, with the bypass having a single check valve and a water meter accurately registering flow rates up to two gallons per minute and visually showing a registration for all rates of flow.

Spill-Resistant Pressure Vacuum Breaker (SVB): An assembly with an independently acting, internally loaded check valve and an independently acting, loaded air inlet valve located on the discharge side of the check valve, with shutoff valves at each end and a test cock and bleed/vent port, to enable accurate field testing of the assembly.

Swivel-Ell: An RP combined with a changeover piping configuration (also known as a swivel-ell connection) that is designed and constructed pursuant to the California Cross-Connection Control Policy Handbook.

Site Supervisor: A person designated by a water user to oversee a water use site subject to SFPUC Rules and Regulations for Users Receiving Recycled Water Service in the City and County of San Francisco. Site Supervisors are considered User Supervisors for the purposes of this Manual.

Site Supervisor: A person designated by a water user to oversee a water use site with a district-scale alternate water source system to subject to San Francisco Health Code Article 12C. Site Supervisors are considered User Supervisors for the purposes of this Manual.

Treatment System Manager: A person designated by a water user to oversee a water use site subject to San Francisco Health Code Article 12C. Treatment System Managers are considered User Supervisors for the purposes of this Manual.

User Supervisor: A person designated by a water user to oversee a water use site and be responsible for the avoidance of cross-connections. This term includes Treatment System Managers in charge of properties with auxiliary water systems and Site Supervisors in charge of properties with municipally supplied recycled water.

Water user: A person or entity who is authorized by the PWS to receive water.

Acronyms and Abbreviations

AMI	Advanced Metering Infrastructure
ASAP	As Soon As Possible
ASSE	American Society of Sanitary Engineering
BFAT	Backflow Assembly Tracker
BPA	Backflow Prevention Assembly
CCC	Cross-Connection Control
CCCPH	Cross-Connection Control Policy Handbook
CCSF	City and County of San Francisco
CCR	California Code of Regulations
CSB	San Francisco Public Utilities Commission Customer Service Bureau
DC	Double-Check valve assembly
DCDA	Double-Check Detector Assembly
DCDA-II	Double-Check Detector Assembly, Type II
DW	Drinking Water
EFWS	Emergency Firefighting Water System
MIS	Management Information System
PIC	Personal Identification Code for accessing BPA information in SFPUC's MIS
PVB	Pressure Vacuum Breaker
RP	Reduced Pressure Principle Backflow Prevention Assembly
RPDA	Reduced Pressure Principle Detector Assembly
RPDA-II	Reduced Pressure Principle Detector Assembly, Type II
RW	Recycled Water
SFDBI-PID	San Francisco Department of Building Inspection, Plumbing Inspection Division
SFDPH-EH	San Francisco Department of Public Health, Environmental Health Branch
SFFD	San Francisco Fire Department
SFPUC	San Francisco Public Utilities Commission
SFWD	San Francisco Water Division of the SFPUC
SVB	Spill-Resistant Pressure Vacuum Breaker
SWRCB	State Water Resources Control Board, Division of Drinking Water
TBD	To Be Determined
WQD	Water Quality Division of the SFPUC

Executive Summary

The primary purpose of this Cross-Connection Control Plan and Program Manual (Manual) is to demonstrate compliance with the State Water Resources Control Board, Drinking Water Division's (SWRCB's) Cross-Connection Control Policy Handbook (CCCPH), which went into effect on July 1, 2024. A matrix of CCCPH requirements with the location in the Manual where each requirement is addressed is provided in Appendix A. This Manual also provides consolidated guidance to City and County of San Francisco (CCSF) staff and the public regarding the San Francisco Public Utility Commissions (SFPUC's) implementation of its cross-connection control policies.

The SFPUC is the entity responsible for administering CCSF's Cross-Connection Control Program. The SFPUC General Manager has designated the Water Quality Division (WQD) Director to act on the General Manager's behalf to address cross-connection control issues. This program applies to the seven community water systems under the control of the SFPUC: the San Francisco Water System, San Francisco Regional Water System, Town of Sunol Water System, Treasure Island and Yerba Buena Island Water System, Pleasanton Well Field Water System, Thomas Shaft Wholesale Water System, and Moccasin Compound Water System. The program also applies to the SFPUC's two noncommunity water systems, Early Intake Compound Water System and O'Shaughnessy Compound Water System.

The SFPUC established its Cross-Connection Control Program in 1984 and has collaborated since then with the San Francisco Department of Public Health, Environmental Health Branch (SFDPH-EH), Department of Building Inspection, Plumbing Inspection Division (SFDBI-PID), and the San Francisco Fire Department (SFFD) to implement it. The program was compliant with the California Code of Regulations Title 17 requirements for backflow protection until these regulations were repealed and replaced by the CCCPH.

Before the effective date of the CCCPH, the SFPUC's Cross-Connection Control Program already complied with most of the CCCPH's requirements, but the SFPUC is taking additional action to fully address four new requirements:

- Hazard assessments of all service connections: the SFPUC will complete initial hazard assessments for its community water systems within 25 years from the effective date of the CCCPH (by June 30, 2049). The SFPUC will need to dedicate supervisory, technical, and administrative resources to meet this deadline. The SFPUC will complete initial hazard assessments of its noncommunity water systems within two years of the effective date of the CCCPH (by June 30, 2026).

Given the SFPUC's well-established Cross-Connection Control Program, compliance activities completed before the SWRCB approves this Manual will be considered as fulfilling CCCPH requirements. Documented historical hazard assessments serve as the required initial hazard assessments. In addition, hazard assessments are considered complete for service connections that have reduced pressure principle assemblies (RPs) that are correctly installed and current with required annual inspection and testing. Isolation in lieu of containment has been accepted where appropriate, as described in Section 3.1 of this Manual. Subsequent hazard assessments for its community water

systems will be completed on a 20-year cycle, and for its noncommunity water systems, at the frequency required by the CCCPH.

- Double-check valve assemblies (DCs) or RPs on all fire services: the SFPUC will complete these upgrades by June 30, 2039. A five-year extension is needed due to the size, cost, and complexity of this project. The SFPUC will need to dedicate staff and contractors to meet this deadline.
- RPs on temporary connections to hydrants: the SFPUC's San Francisco Water Division (SFWD) will upgrade current backflow protection by June 30, 2027. This time is needed to procure, test, and distribute the RPs.
- Public outreach and education program: the SFPUC's Communications staff and WQD will expand CCSF's current program to more fully address CCCPH requirements.

The SFPUC's schedule to achieve full compliance with the CCCPH is presented in the table below.

Task	Duration (Years)	Start	Finish	2020-2025	2025-2030	2030-2035	2035-2040	2040-2045	2045-2050
CCC Policy Handbook effective	-	7/1/24	N/A						
SFPUC must submit CCC plan	1.3	7/1/24	10/1/25						
Initial hazard assessments to be completed	25	7/1/24	6/30/49						
Fire services must have DCs	15	7/1/24	6/30/39						
Hydrants must have RPs	3.0	7/1/24	6/30/27						

1 Introduction

1.1 Purpose of this Cross-Connection Control Plan and Program Manual

The purpose of this Manual is to document the CCSF's compliance with the SWRCB's CCCPH, which became effective on July 1, 2024. The Manual also provides guidance to CCSF staff, contractors, backflow prevention assembly (BPA) testers and cross-connection control specialists, building owners, and other stakeholders regarding cross-connection control practices mandated by federal, state, and local laws and regulations. CCSF's Cross-Connection Control Program applies to the seven community water systems under the control of the SFPUC: the San Francisco Water System, San Francisco Regional Water System, Town of Sunol Water System, Treasure Island and Yerba Buena Island Water System, Pleasanton Well Field Water System, Thomas Shaft Wholesale Water System, and Moccasin Compound Water System. The Cross-Connection Control Program also applies to the SFPUC's two noncommunity water systems, Early Intake Compound Water System and O'Shaughnessy Compound Water System.

This Manual's guidance regarding CCSF's Cross-Connection Control Program is intended for informational purposes only and does not, itself, set applicable standards governing cross-connection controls or backflow prevention into CCSF's water systems. In the event there is any discrepancy or conflict between the contents of this Manual and any provision of applicable laws and regulations governing cross-connections and backflow prevention, including, but not limited to, Article 12A of the San Francisco Health Code, SFPUC Rules and Regulations Governing Water Service to Customers, Section G, Cross-Connection Control (Rules and Regulations Section G), or the CCCPH, the standards in those laws and regulations shall govern.

1.2 Cross-Connection Control Program Administration

Under CCSF Health Code Article 12A (Backflow Prevention), the SFPUC is responsible for CCSF's Cross-Connection Control Program. Under Rules and Regulations Section G, the SFPUC General Manager has designated the Director of WQD to act on the General Manager's behalf to administer the program. The SFPUC works with other CCSF entities to implement the program: the SFDPH-EH, SFDBI-PID, and SFFD. SFPUC's San Francisco Water Department (SFWD) and Customer Service Bureau (CSB) are also involved with Cross-Connection Control Program operations.

The SFPUC's Cross-Connection Control Program is managed by a Cross-Connection Control Program Coordinator, who maintains certifications as both a cross-connection control specialist and BPA tester. The SFPUC has also designated a secondary program coordinator. Appendix B includes the names and contact information for the primary and secondary program coordinators, along with six WQD Water Service Inspectors (WQD Inspectors) and a Senior Health Inspector who work with the program, as well as one Water Quality Technician, all of whom are cross-connection control specialists/BPA testers. Outside of regular business hours, a WQD Inspector is always on call and can respond in under an hour to urgent concerns.

1.3 Cross-Connection Control Program Background

CCSF established its Cross-Connection Control Program in 1984 with the promulgation of San Francisco Health Code Article 12A. The article established a cross-connection control committee consisting of WQD, SFDPH-EH, and SFDBI-PID. CCSF revised Article 12A in 2016, and in the same year, the SFPUC issued its Rules and Regulations Section G, which implement Article 12A.

California's backflow prevention requirements were first established in 1987 by the California Code of Regulations, Title 17, Division 1, Chapter 5. Subchapter 1, Group 4, §7583–7605. Title 17 requirements became inoperative and were superseded by the CCCPH, effective date July 1, 2024. In December 2024, the SFPUC revised its Rules and Regulations Section G of its Rules and Regulations to conform with the requirements of the CCCPH and make other updates and modifications. The current versions of Article 12A and Rules and Regulations Section G are included in Appendix C.

The San Francisco Water System has about 182,700 service connections. WQD tracks roughly 35,000 BPAs for both containment and isolation. The number of assemblies in San Francisco grew at a compounded annual growth rate of about 6 percent between 1995 and 2024 (Figure 1-1). By 2039, the SFPUC expects to be tracking over 50,000 BPAs.

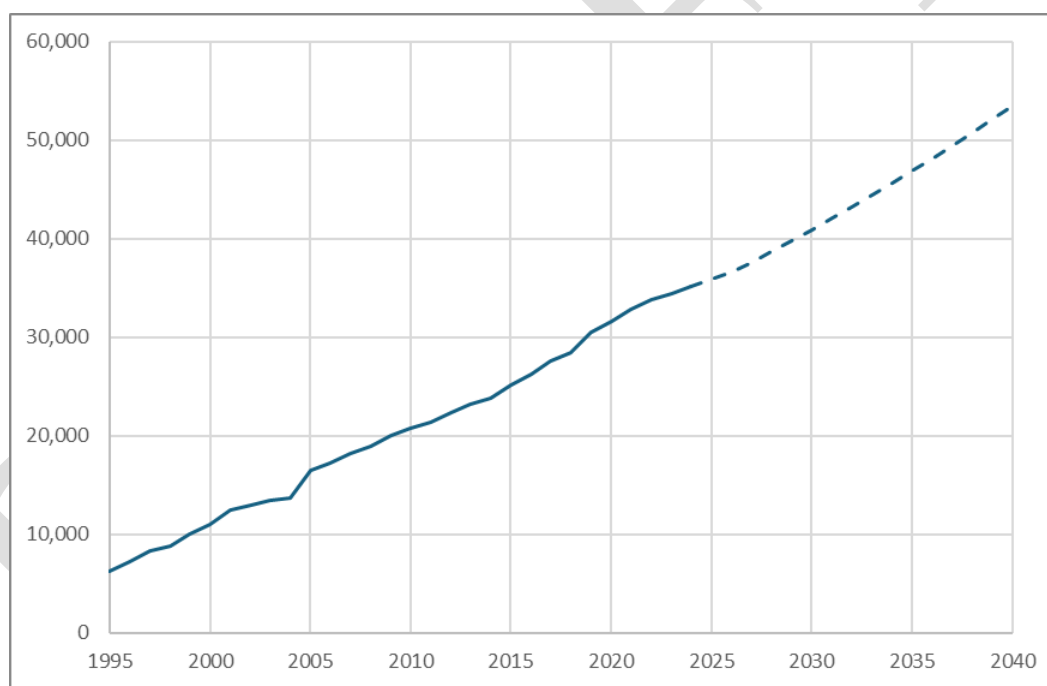


Figure 1-1. Backflow Prevention Assembly Growth in San Francisco

WQD tracks BPAs in a proprietary Management Information System (MIS) but expects to transition to a commercial application by early 2026. The MIS maintains information about BPAs, Air Gap separations (Air Gaps), and other information, as described in Section 17 of this Manual.

1.4 Applicable Regulations

The regulations applicable to cross-connection control are listed below:

- Federal: Safe Drinking Water Act (1974, amended 1986 and 1996) and Safe Drinking Water Act Amendments of 1986.
- State: Cross-Connection Control Policy Handbook; California Health and Safety Code, Chapter 5; California Code of Regulations (CCR) Title 22; and California Plumbing Code, Chapters 6, 15, and 16.
- Local:
 - San Francisco Health Code, Article 12A (Backflow Prevention) and Article 12C (Alternate Water Sources for Non-Potable Applications)
 - SFPUC Rules and Regulations Governing Water Service to Customers, Section G (Cross-Connection Control)
 - SFPUC Rules and Regulations Governing Hydrant Use for Temporary Water Supply (anticipated in 2026)
 - SFPUC Rules and Regulations for Users Receiving Recycled Water Service in the City and County of San Francisco
 - SFDPH-EH Director's Rules and Regulations Regarding the Operation of Alternate Water Source Systems
 - San Francisco Plumbing Code, Chapter 6

Appendix C provides the full text of the local regulations listed above, along with the CCCPH.

1.5 What Is a Cross-Connection?

The CCCPH defines a cross-connection as “[a]ny actual or potential connection or structural arrangement between a public water system, including a piping system connected to the public water system and located on the premises of a water user or available to the water user, and any source or distribution system containing liquid, gas, or other substances not from an approved water supply.” If the pressure of an unapproved source exceeds the pressure in the public water system, water or other fluids can flow from water user premises into the public water system; this is known as backflow. Backflow can occur because of either a backpressure or backsiphonage condition.

Backpressure conditions occur when the pressure in a user's system exceeds the pressure in the water supply system, and the pressure in both systems is greater than atmospheric pressure. Examples of sources of backpressure are:

- Pressurized industrial fluid systems.
- Booster pumps that supply water to industrial fluid piping systems.
- Interconnections with other piping systems that operate at higher pressures than the municipal water supply system.

- Unapproved interconnections between different water supply system pressure zones.

Backsiphonage is backflow caused by negative pressure (less than atmospheric pressure) in the municipal water supply piping. Backsiphonage can occur when the demand on the water supply system exceeds its normal delivery capacity. Situations where backflow can occur due to backsiphonage are:

- Reduced supply pressure caused by high water use, such as during firefighting or water main flushing.
- Undersized supply piping.
- Waterline repairs or pipe breaks at locations lower in elevation than the service connection.

Figure 1-2 illustrates some common examples of cross-connections.

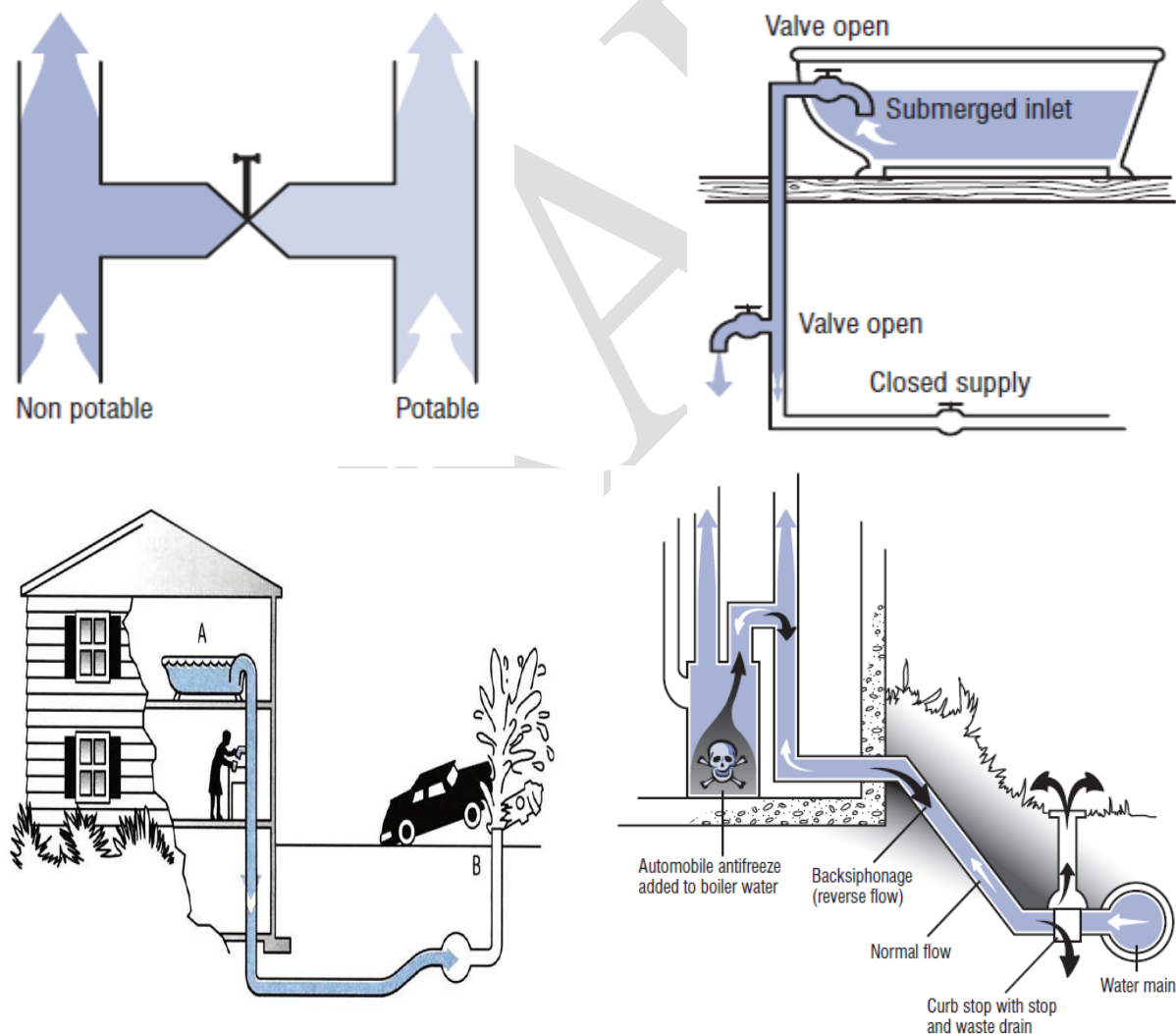


Figure 1-2. Examples of Cross-Connections

Source: US Environmental Protection Agency, 2003. *Cross-Connection Control Manual*.

1.6 Why Cross-Connections Exist

Cross-connections exist for a variety of reasons, including:

- Plumbing is frequently installed by individuals who are not familiar with the dangers of cross-connections.
- Connections are made as a matter of convenience without regard to the hazardous situation that might be created.
- Connections have inadequate protection (i.e., connections are protected by BPAs not approved for the corresponding degree of hazard).

1.7 Public Health Significance of Cross-Connections

Backflow through cross-connections places the public water system at risk by allowing contaminants or pollutants to enter the community water supply. Numerous cases have been documented⁵ of cross-connections causing contamination or pollution of public water supplies, with results ranging from aesthetic problems (taste or odor) to illness and, in some cases, death. Backflow incidents in Santa Monica, San Diego, and Los Angeles in 2015 and 2016 contaminated the public water supply and were factors in the enactment of Assembly Bill 1671, Backflow Protection and Cross-Connection Control: Standards in 2017 and to the eventual adoption of the CCCPH by the SWRCB in 2024. It is imperative that cross-connections be prevented to protect the public water system.

1.8 Responsibilities of the Entities Involved in CCSF's Cross-Connection Control Program

Successful operation of the Cross-Connection Control Program requires the cooperation of and coordination among the SFPUC divisions and bureaus, other CCSF departments, property owners and other water users, BPA testers, cross-connection control specialists, contractors, and regulatory agencies. Each party is responsible for performing its part to safeguard the public water system. The responsibilities of these entities are described below.

San Francisco Public Utilities Commission

As a supplier of potable water, the SFPUC has the primary responsibility for preventing unauthorized substances or water from unapproved sources from entering the public water supply system. The SFPUC, through WQD:

- Develops, implements and maintains a Cross-Connection Control Program, including monitoring, inspection, and testing of BPAs.
- Ensures the potability of water in the distribution system up to the point of connection to the water user's service line. This responsibility includes protecting the distribution system from potential contamination or pollution by customers (containment).
- Ensures that property owners maintain and annually test their BPAs to verify proper operation.
 - Notifies water customers of the due date for annual testing of their BPAs and follows up with customers that fail to comply in a timely manner.

- Enforces the requirements of the SFPUC's Cross-Connection Control Program.
- Maintains records of BPA installation, maintenance, and testing for at least three years.
- Refers to SFDPH-EH and SFDBI-PID newly discovered hazards, e.g., existing buildings over 40 feet high that are being renovated or replumbed and do not have adequate backflow protection at the service connection.
- Immediately shuts off water service to any property that has been identified as posing an existing or imminent risk of hazard to public health and safety. WQD coordinates the shut-off with CSB or SFWD, depending on the size of the service connection, and informs SFDPH-EH and SFDBI-PID of the action.
- Responds to two-alarm and greater fires to:
 - Document site conditions
 - Inspect hydrant hook-ups to make sure backflow prevention valves are used
 - Make appropriate reports to regulatory agencies
 - Coordinate mitigation with SFWD and SFFD
- Provides backflow tags (sold by CSB) to be attached to BPAs to indicate that they have passed inspection and testing.
- Co-hosts with SFDPH-EH an annual meeting for Authorized Backflow Prevention Assembly Testers (Authorized Testers) and Authorized Cross-Connection Control Specialists (Authorized Specialists). The purpose of the meeting is to review program procedures and issues, discuss new regulations, and address questions from testers.
- Prepares cross-connection compliance data to be submitted to the SWRCB on a monthly and as-needed basis. Monthly data include a summary of consumer complaints and investigations of negative consumption (backflow).
- Facilitates monthly meetings with SFDPH-EH, DBI-PID, SFFD, and other CCSF agencies as appropriate.
- Maintains this Manual.

Property Owner or Customer

As a condition of receiving water service, all property owners, customers, and other water users must comply with San Francisco Health Code Article 12A, Rules and Regulations Section G, the CCCPH, and any other applicable requirement under CCSF, state, or federal law. Property owners and customers must properly install and ensure that an approved BPA or Air Gap is in use at all times at the point of connection when directed to do so by the SFPUC or if any of the facilities, functions, or conditions listed in Table 3-1 of this Manual exist.

The property owner/customer responsibility begins at the customer side of each water service's point of connection and extends through the entire length of the water system within the customer's premises. Property owners/customers must:

- Obtain all necessary permits from SFDBI-PID before starting work on any plumbing modification.
- Be responsible for expenses incurred for the proper installation, operation, testing, maintenance, and relocation of BPAs.
- Install, repair/replace, and test BPAs upon notification of the need to do so, by the date specified in the notification. Testing is required at least annually.
- Maintain accurate records of tests, inspections, and repairs made to BPAs and provide WQD with copies of these records upon request.
- Notify WQD immediately of any possible hazards, pollutants, or contaminants that might have entered the public water system from the customer's internal system.
- Exercise caution not to create cross-connections when modifying plumbing systems.
- Use only Authorized Testers for testing or repair and licensed plumbers for installation, removal, and replacement of BPAs.

Buildings using recycled water or treating on-site auxiliary water sources for reuse on site are required to have a User Supervisor. User Supervisors are responsible for complying with CCSF, state, and federal regulations governing the use and application of auxiliary water. Industrial water users may, at the discretion of the SFPUC or SFDPH-EH, also be required to designate a User Supervisor if their premises have multiple piping systems that convey different types of fluids, some of which may be hazardous, and where changes in the piping system are frequently made. The User Supervisor is responsible for preventing cross-connections during the installation, operation, and maintenance of the water user's pipelines and equipment.

San Francisco Department of Public Health, Environmental Health Branch

The SFPUC has delegated certain responsibilities to SFDPH-EH via a signed interdepartmental work order and workplan (Appendix D). SFDPH-EH:

- Maintains a program to authorize qualified BPA testers and cross-connection control specialists to work in San Francisco by issuing them permits to operate.
- Maintains a list accessible to the public of Authorized Testers and Authorized Specialists.
- Assists WQD with assessing hazards on properties that are designated as residential in CSB's database but appear to be commercial from the exterior.
- Assists WQD with enforcement of cross-connection control requirements. Enforcement procedures are described in Section 20.
- Co-hosts with WQD an annual meeting for Authorized Testers and Authorized Specialists.
- Attends monthly coordination meetings facilitated by WQD.

San Francisco Department of Building Inspection, Plumbing Inspection Division

SFDBI-PID is responsible for enforcing plumbing regulations, including those related to potential cross-connections in buildings (isolation). SFDBI-PID:

- Issues permits for new and modified plumbing installations.
- Issues permits to operate for boilers.
- During final building inspection, verifies that the appropriate isolation BPAs have been correctly installed and passed testing, as indicated by a backflow tag.
- During final building inspection, verifies that the appropriate non-testable backflow prevention devices have been correctly installed. The Universal Plumbing Code does not require maintenance of non-testable devices.
- Attends monthly coordination meetings facilitated by WQD.

San Francisco Fire Department

- Uses approved backflow prevention devices when connecting to potable hydrants during firefighting.
- Attends monthly coordination meetings facilitated by WQD.

Authorized Backflow Prevention Assembly Testers

Testers are responsible for making competent inspections and for repairing BPAs that fail testing, if possible, and authorized by the property owner or customer. Testers must:

- Obtain and maintain a valid Permit to Operate from SFDPH-EH as an Authorized Tester.
- Attend the Annual Meeting for Authorized Testers and Authorized Specialists.
- Ensure their testing equipment is calibrated at least once a year (tracked in the SFPUC's MIS).
- Attach backflow tags to BPAs and Air Gaps that have passed testing or inspection, respectively.
- Report to WQD any BPA or Air Gap that has been modified or incorrectly installed or does not provide adequate protection against the hazard.
- Immediately report to WQD potential backflow incidents, unprotected cross-connections, or other issues or problems related to cross-connection control that are observed in the field.
- Upload field inspection and testing results, including repairs, to the SFPUC's MIS within five business days of testing.
- Use original manufacturer's parts when repairing BPAs.

Authorized Cross-Connection Control Specialists

Cross-connection Control Specialists conduct cross-connection control tests and site surveys to assess compliance cross-connection control requirements in San Francisco. They may also inspect Air Gaps. Specialists must:

- Obtain and maintain a valid permit to operate from SFDPH-EH as an Authorized Specialist.
- Attend the Annual Meeting for Authorized Testers and Authorized Specialists.
- Attach backflow tags to Air Gaps that have passed inspection.
- Report to WQD any Air Gap that has been modified or incorrectly installed.
- Immediately report to WQD any potential backflow incidents, unprotected cross-connections, or other issues or problems related to cross-connection control that are observed in the field.
- Report the results of cross-connection control tests and site surveys to the customer and WQD.

Contractors

Contractors are responsible for complying with all regulations and requirements related to plumbing installations, fixtures, temporary hydrant use, BPAs, and cross-connection control, including obtaining appropriate permits.

2 Protecting the Public Water System

One of the ways that the SFPUC protects drinking water is preventing the contamination or pollution of potable water supplies through connections to non-potable sources. This is accomplished by:

- Requiring the installation of appropriate BPAs, as specified by the SFPUC (WQD/SFDBI-PID).
- Specifying the appropriate level of backflow protection at the point of connection to the water system (WQD).
- Making sure BPAs and Air Gaps work (WQD).
- Ensuring that new and modified connections have proper backflow protection (WQD/SFDBI-PID).
- Responding to complaints and reports of cross-connections (WQD)
- Inspecting Air Gaps at wastewater treatment plants and the tanks and reservoir serving the non-potable part of the SFPUC's Emergency Firefighting Water System (WQD).
- Requiring backflow protection for temporary service connections to hydrants (SFWD).
- Monitoring the connections to hydrants during second-alarm and greater fires (WQD).

2.1 Requiring Backflow Protection

The SFPUC requires that backflow protection be installed wherever there is a potential threat to the public water supply. Six types of BPA are approved for use for containment (protection of the public water supply) in San Francisco: RP, DC, reduced pressure principle detector assembly (RPDA), double-check detector assembly (DCDA), reduced pressure principle detector assembly Type II (RPDA-II), and double-check detector assembly Type II (DCDA-II). These BPAs are described in Appendix E. Existing pressure vacuum breakers (PVBs) installed on irrigation systems may remain in place under conditions specified in Section 3.1 of this Manual. In many cases, WQD may approve an Air Gap in lieu of the assemblies listed above. Assemblies and Air Gaps are available commercially from various manufacturers; Air Gaps can also be fabricated.

2.2 Making Sure Backflow Prevention Assemblies and Air Gaps Work

The SFPUC ensures that:

- BPAs are tested at least once a year, and when found defective, they are repaired or replaced. At the end of 2024, there were over 35,000 BPAs in San Francisco, and this number is anticipated to exceed 50,000 BPAs by 2039.
- Air gaps are inspected and repaired or replaced, if necessary.
- BPAs are tested by Authorized Testers. SFDPH-EH maintains a list of test companies employing Authorized Testers. The list can be accessed at www.sfpuc.gov/backflow.

- BPA's are tested immediately after they are installed, relocated, or repaired and are not placed in service unless they are functioning as required.
- Water customers are notified when testing of BPA's on their property is required. The notices indicate the date by which tests must be completed.
- Reports of testing and maintenance are maintained for a minimum of three years.

2.3 Ensuring That New and Modified Connections Are Protected

CCSF evaluates the safety of new and modified connections to the potable water system through reviews of applications and site inspections:

- The SFPUC conducts a hazard assessment of all new water service connections and determines whether protection against backflow at the service connection is warranted to protect the public water system. If so, the SFPUC ensures that the proper protection is correctly installed before continuous water service is granted.
- All new BPA's must be tested and test results submitted to WQD within five business days of testing. BPA's must be tested annually thereafter.
- SFDBI-PID confirms that internal backflow protection is adequate as part of the building inspection process.
- If a modification to a building requires that existing BPA's be replaced, relocated or removed, the customer or property owner is required to obtain a permit from SFDBI-PID before performing the work. As part of the permit review process, SFDBI-PID must approve all modifications. As part of the building inspection process, SFDBI-PID verifies that modifications are consistent with the terms of the permit and that lines are capped, BPA's installed, or relocations accomplished in compliance with applicable codes. Information about modifications, relocations, or removals is forwarded to WQD for entry into the Cross-Connection Control Program's database.
- If a modification to a building increases the building height to 40 feet or more above the point of connection, SFDBI-PID, as part of the permit review process, specifies that the customer/contractor install a DC, in conformance with the San Francisco Plumbing Code.

2.4 Responding to Water Quality Complaints and Reports of Cross-Connections

The SFPUC responds to water quality complaints received through the CCSF 311 call center, online complaint portal, or by other means. WQD Inspectors attempt to contact customers, identify the cause of complaints, and work with customers and/or SFPUC operations to resolve complaints. In about one-third of cases, WQD Inspectors visit the customer and collect water samples for analysis. If appropriate, WQD Inspectors take water pressure readings. Sometimes, WQD Inspectors confer with WQD Engineering and Laboratory sections and coordinate with SFPUC Communications, SFWD, SFDPH-EH, and SWRCB for comprehensive investigations, public communications, or corrective actions. In case of a cross-connection that might present a risk to the public water system, the SFPUC follows the procedures in Section 16 of this Manual, Emergency Cross-Connection Response Plan.

WQD Inspectors document investigations, response, and follow-up in either the SFPUC's 311 complaint database (if the complaint originated with the customer) or SFPUC's files sharing site (if the complaint originated internally to the SFPUC). WQD reports monthly summaries of water quality complaints and responses to the SWRCB as part of the SFPUC's monthly compliance report for the San Francisco Water System. The SFPUC very rarely receives water quality complaints from its other water systems but would investigate them in a similar way.

The SFPUC's level of service performance measure is to respond to customer complaints within two regular business hours (8 AM to 5 PM, Monday–Friday, excluding holidays). Complaints received outside of regular business hours are responded to by 10 AM on the next business day, unless the complainant asks to speak with a WQD Inspector before the next business day, in which case, WQD Inspectors usually call the complainant back within an hour. WQD also investigates potential cross-connections reported by other CCSF departments.

2.5 Inspecting Air Gaps at Wastewater Treatment Plants and Emergency Firefighting Water System Tanks and Reservoir

WQD inspects the Air Gaps at the SFPUC's Southeast, North Point and Oceanside wastewater treatment plants annually to evaluate whether the gaps are appropriately sized, installed correctly and functioning properly. WQD also inspects Air Gaps at Ashbury Tank, Jones Street Tank, and Twin Peaks Reservoir, all of which serve the non-potable part of the SFPUC's EFWS.

2.6 Requiring Backflow Protection for Temporary Connections to Hydrants

The SFPUC provides temporary water service via connections to hydrants. Contractors may request a temporary connection to potable water hydrants for various construction activities, such as dust control, site grading and compaction, on-site mixing of concrete and cement, pressure testing of pipes, and cleaning of tools and equipment. Organizers of outdoor events, such as music festivals and street fairs, may also request temporary connections. Temporary connections require a hydrant meter to measure the water used and backflow protection to protect the public water system. The SFPUC Meter Shop provides hydrant meters with backflow protection. Current backflow protection will be upgraded to RPs to conform with CCCPH requirements, as described in Section 9 of this Manual

2.7 Monitoring Connections to Hydrants during Firefighting Activities

SFPD personnel normally connect their hoses to potable, low-pressure hydrants using spring-loaded swing-check valves for backflow protection, as listed in Table 3-1 of this Manual. The SFPUC's requirements for SFPD to connect to low-pressure hydrants are included in Appendix C. If the water volume or pressure supplied by low-pressure hydrants is insufficient to fight a fire, or the SFPUC or SFPD otherwise determine it to be warranted, firefighters may also connect to high-pressure EFWS hydrants, depending on availability. Connections to the non-potable part of the EFWS do not require backflow protection. However, inadvertently connecting a fire engine to both a non-potable high-pressure hydrant and a potable low-pressure hydrant at

the same time could result in a cross-connection and the possible introduction of non-potable water into the public water system.

The SWRCB requires that a WQD Inspector who is also a cross-connection control specialist be present at two-alarm or greater fires (excerpt of order 02-04-95CO-006 provided in Appendix C). The role of the WQD Inspector is to document site conditions, inspect hydrant hook-ups to ensure backflow prevention check valves are used, make appropriate reports to regulatory agencies, and coordinate mitigation with the SFWD gateman (person in charge of opening and closing valves on water mains) in case of a cross-connection between the potable water system and non-potable water sources. The WQD Inspector participates in testing, sampling, and flushing activities in case of a cross-connection and has the responsibility for coordinating with the on-call WQD Engineer and appropriate CCSF agencies.

3 Type and Level of Backflow Prevention Required

3.1 Backflow Prevention Assemblies for Containment

As indicated in Rules and Regulations Section G, Rule 3, WQD has approved six basic types of BPAs for containment in permanent installations, as listed in Section 2.1 and described in Appendix E. New installations of PVBs and SVBs are not allowed for containment, but existing containment PVBs installed on roadway right-of-way irrigation systems may remain in place under the following conditions: 1) all downstream piping is at least 12 inches (or listed distance) below the BPA and 2) the BPA is in working condition. (The SFPUC does not have any SVBs used for containment.) If a containment PVB fails and cannot be repaired, it must be replaced with an RP. PVBs and SVBs are also described in Appendix E. The SFPUC has approved existing internal protection in lieu of containment when it provides adequate protection for the hazard. The SFPUC will approve future internal protection in lieu of containment when it provides adequate protection for the hazard and premises containment is not feasible due to site conditions.

To be approved for use in San Francisco, BPAs must meet the following requirements:

- Be “lead-free” as defined in the California Health and Safety Code §116875. Associated pipe, fittings, solder and flux, must also be lead-free.
- Be approved through both laboratory and field evaluation tests performed in accordance with at least one of the following:
 - Standards found in Chapter 10 of the Manual of Cross-Connection Control, Tenth Edition, published by the University of Southern California Foundation for Cross-Connection Control and Hydraulic Research, i.e., be on the foundation’s “List of Approved Backflow Prevention Assemblies.”
 - Certification requirements for BPAs in the Standards of ASSE International current as of 2022 that include ASSE 1015-2021 for the DC, ASSE 1048-2021 for the DCDA & DCDA-II, ASSE 1013-2021 for the RP, and ASSE 1047-2021 for the RPDA & RPDA-II and must have the 1YT mark.
- Be installed in the same orientation as tested and approved. No modifications to the approved configuration may be made, except as authorized in Section 4 of this Manual.
- Be field tested to ensure they are functioning properly before being placed into service.

Air Gaps must meet the requirements set forth in the San Francisco Plumbing Code, Chapter 6 §603.3.1 (included in Appendix C).

Additional considerations:

- The type of BPA installed and in use must meet at least the minimum level of protection for the applicable hazard identified in Table 3-1 below. A DC may only be used to protect against low-hazard cross-connections. An RP or Air Gap is required to protect against high-hazard cross-connections. On fire services, a DCDA/DCDA-II or RPDA/RPDA-II is required in lieu of a DC or RP, respectively.
- If Table 3-1 identifies two types of BPAs as the required level of protection for the same hazard criterion, or does not specify the type, the SFPUC determines through a hazard

Type and Level of Backflow Prevention Required

assessment which is required for the particular hazard criterion. If more than one hazard criterion applies to a property, the hazard criterion requiring the greatest level of protection in Table 3-1 applies.

- If the SFPUC is unable to assess a property to determine the type of hazard(s) present, the property owner will be required to install an RP at the point of connection.

For containment protection at properties that may temporarily switch between municipally supplied recycled water and potable water from the public water system, a property owner may install a swivel-ell for containment, in lieu of an Air Gap. The requirements and conditions for use of a swivel-ell are given in Section 14.4 of this Manual.

Table 3-1. Hazard Criteria and Required Backflow Protection for Containment
Attention: See footnotes for important information.

Hazard Criteria	Required Level of Protection
Hazardous Substances/Wastewater	
• Hazardous substances handled in any way the substances could enter the public water system • Mobile home park, recreational vehicle park, or campgrounds with recreational vehicle hookups • Self-contained, self-cleaning public toilet • Sewage handling facility • Wastewater lift stations and pumping stations • Wastewater treatment processes, handling, or pumping equipment that is interconnected to a piping system connected to the public water system	AG or RP ¹
Medical/Laboratory/Research	
• Biotech facility • Dental office with water-connected equipment • Kidney dialysis facility • Laboratory • Medical facility/hospital/clinic • Mortuary • Veterinarian facility	AG or RP ¹
Manufacturing/Processing/Storage	
• Chemical plant • Electronics manufacture • Metal-plating facility • Petroleum processing or storage plant • Radioactive material storage, processing plant, or nuclear reactor	AG or RP ¹
Commercial	
• Business park with a single meter serving multiple businesses	AG or RP ¹

**Type and Level of
Backflow Prevention Required**

Hazard Criteria	Required Level of Protection
• Car wash • Dry cleaner facility • Gas station • Hotel/motel • Industrial or commercial laundry facility • Pet grooming	
Irrigation Systems	
• Cemetery • Dedicated irrigation service • Premises with irrigation system into which fertilizers, herbicides, or pesticides are or can be injected	RP
Water Storage Tanks	
• Drinking water storage tank overflow connected to a sump or storm drain • Water storage facility not under control of the SFPUC	AG
Other	
• Agricultural premises • Airport • Auxiliary water supply • Dual-plumbed property • Dockside watering point or marine facility • Fire station • Incarceration facility (prison) • Private water distribution main • Railroad maintenance facility • Solid waste disposal facility	AG or RP ¹
Miscellaneous Conditions	
• Intricate plumbing and piping arrangements³ • Repeated history of cross-connections being established or re-established² • Restricted entry to a property or parts of a property such that hazard assessments cannot be made with sufficient frequency or at sufficiently short notice to assure that cross-connections do not exist • Unabated internal cross-connections • Any other on-site hazard that the SFPUC identifies as requiring abatement for the protection of the public water system	AG or RP ¹
Properties with Multiple Service Connections to the PWS	
• Properties with multiple service connections, excluding fire services, at least one of which requires backflow protection for containment	Varies ³

**Type and Level of
Backflow Prevention Required**

Hazard Criteria	Required Level of Protection
Buildings 4 or More Stories High or Water Supply Over 40 Feet Above Water Meter	
Buildings 4 stories or more in height or water supply greater than 40 feet above the water meter	RP ⁴
Fire Protection Systems	
Properties where the fire protection system is supplied from the public water system and interconnected with an onsite auxiliary water supply	AG
Properties where the fire protection system is supplied from the public water system with no interconnections with auxiliary water supplies	DCDA or DCDA-II
Properties where chemicals can be injected into the fire system	RPDA or RPDA-II
Properties under the jurisdiction of the San Francisco Port Authority	RPDA or RPDA-II
Construction/Miscellaneous Hydrant Use	
- Temporary connections to hydrants for miscellaneous uses, including construction and special events⁴ - Temporary connection to existing water service line during construction (non-standard service)	RP
Temporary connections to hydrants for filling water tanks on vehicles, such as for street sweeping	RP or AG ⁵
Temporary Connections to Hydrants for Firefighting	
Fire trucks that are connected to low-pressure hydrants must not be connected at the same time to any non-potable high-pressure hydrants that are a part of the EFWS	Spring-loaded check valve ⁶

Notes:

- The SFPUC determines the required level of protection based upon a hazard assessment.
- In addition to the required level of protection for the identified hazard criterion, the SFPUC may also require the property owner to designate a User Supervisor, and the property owner and User Supervisor must comply with the requirements in Section 18 of this Manual.
- All service connections, excluding fire services, must have at least the same level of protection, which must address the highest degree of hazard on the property. For example, if one connection requires an RP, then every connection must have an RP.
- The SFPUC may allow a DC instead of an RP if flooding is a concern, e.g., if there is valuable property that could be damaged (e.g., computer servers, artwork in a museum basement).
- All customer plumbing must be downstream of the SFPUC-issued meter and RP that customers are required at all times to use when accessing temporary water supply through low-pressure hydrants, in accordance with all SFPUC rules and regulations.
- The SWRCB approved the use of spring-loaded check valves on hydrants during firefighting in Compliance Order 02-04-95CO-006. The order requires a WQD Inspector who is also a cross-connection control specialist to respond to all two-alarm and higher fires to check for cross-connections between the public water system and the non-potable EFWS.

3.2 Backflow Prevention Assemblies for Isolation

For isolation of a hazard within a property, property owners must install a BPA or Air Gap that meets the minimum level of protection required in Chapter 6 of the California Plumbing Code, unless one or more of the hazard criteria identified in Table 3-2 applies to the property, in which case the property owner must install an RP or Air Gap.

Table 3-2. Hazard Criteria and Required Backflow Protection for Isolation of Hazards within a Property

Hazard Criteria	Required Level of Protection
Auxiliary water storage tank with potable water makeup supply	AG
Irrigation systems into which fertilizers, herbicides, or pesticides are or can be injected	RP
Carbonators in systems with upstream copper pipe	RP
Industrial water chillers	RP
Sewage and hazardous or potentially hazardous substances: at the connection of potable water piping within a facility to a system conveying a fluid that is not potable	AG

3.3 Alternative Compliance Options

In unusual cases, subject to approval by the SWRCB on a case-by-case basis, the SFPUC may allow alternative options to the requirements in Tables 3-1 and 3-2, as long as the alternative provides adequate protection for the hazard. Examples of these alternatives are provided below.

- BPAs more than 25 feet from the point of connection: the SFPUC has allowed BPAs to be more than 25 feet from the point of connection in rare instances with additional mitigation, including enclosing the pipe, labeling (drinking water line—do not tap), required annual inspections by a cross-connection control specialist, and/or static pressure tests to ensure the integrity of the pipe.
- Installation of two RPs in sequence instead of an Air Gap in a case where installing an Air Gap was not feasible due to site constraints.
- Installation of two DCs in sequence instead of an RP in cases where potential flooding is a concern, e.g., if there is valuable property that could be damaged (e.g., computer servers, artwork in a basement).
- Installation of one DC instead of an RP in cases where potential flooding is a concern, with BPA tests required every six months instead of annually.

SFPUC has spool pieces and valving arrangements to separate the potable water in its transmission/distribution system from raw water.

- Clarendon Avenue (part of the Emergency Firefighting Water Supply)
- Crystal Springs Pump Station
- Harry Tracy Water Treatment Plant
- Lake Merced Pump Station
- San Antonio Pump Station

3.4 Internal Backflow Protection at SFPUC Drinking Water Facilities and Recycled Water Plants

The SFPUC will conduct hazard assessments of its facilities producing, treating, storing, or distributing drinking water and of water recycling plants, as defined by CCR Title 22 §60301.710, to ensure they have proper internal protection from cross-connections. The SFPUC will ensure that necessary backflow protection is installed and that BPAs are maintained and tested annually.

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4 Installation, Replacement, and Relocation Requirements for Backflow Prevention Assemblies and Air Gaps

Rules and Regulations Section G, Rule 4, sets forth requirements for the installation, replacement, and relocation of BPAs and Air Gaps:

- All installations, replacements, and relocations of BPAs and Air Gaps require a valid permit from SFDBI-PID, unless the property is under the jurisdiction of the Port of San Francisco, California Department of Health Care Access and Information, California Office of the State Fire Marshal, or federal government. In the latter cases, a permit must be obtained from the authority delegated or having jurisdiction.
- BPAs and Air Gaps for containment must be installed as close as practical, but in any case, within 25 feet of the downstream side of the point of connection. If any part of a service line extends over San Francisco Bay or ocean waters, the property owner must install a BPA upstream of the seawall and within 25 feet of the point of connection.
- No connections may be made between the point of connection and a BPA or Air Gap for containment. Similarly, no appurtenances may be installed between the point of connection and BPA or Air Gap, except that a Y strainer may be attached directly upstream of the number 1 shutoff valve of a BPA as long as (1) no connections are made to the Y strainer, (2) the Y strainer is protected from tampering, and (3) the Y strainer is inspected at least annually by an Authorized Tester.
- BPAs must be installed in the orientation intended by the manufacturer and approved by the University of Southern California Foundation for Cross-Connection Control and Hydraulic Research or comparable organization approved by the SFPUC. No modifications may be made to the approved assembly configuration, except that flanged shutoff valves 2.5 inches or larger may be rotated by one bolt hole.
- All BPAs and Air Gaps must be accessible for field testing, inspection, and maintenance after installation. If a BPA is installed in an enclosure, the enclosure must be large enough or removable to allow for testing and maintenance.
- BPAs may not be installed below grade in pits, vaults, or confined spaces. DCs, DCDAs, DCDA-IIs, RPs, RPDAs, and RPDA-IIs must be a minimum of 12 inches and a maximum of 36 inches above grade as measured from the bottom of the BPA.
- DCs, DCDAs, DCDA-IIs, RPs, RPDAs, and RPDA-IIs must have clearances of at least 12 inches on all sides. On the side of the BPA that contains the test cocks, a side clearance of at least 24 inches is required.
- BPAs must be installed so that the make and serial number are visible in a readily accessible location. These identifiers shall not be painted over or otherwise made illegible.
- When an RP, RPDA, or RPDA-II is installed indoors, drainage must also be provided to prevent flooding.

Installation, Replacement, and Relocation Requirements for Backflow Prevention Assemblies and Air Gaps

- Air gaps used for containment must meet the following requirements:
 - The receiving water container must be located on the property at the point of connection, unless the SFPUC approves an alternate location.
 - The Air Gap must be located outside of the receiving water container.
 - All piping between the water service connection and the discharge location at the receiving water container must be above finished grade and be accessible for visual inspection, unless the SFPUC approves an alternative piping configuration.
 - All new installations of Air Gaps at water service connections must be reviewed and approved by the SWRCB before installation.

5 Testing, Inspection, and Repair Requirements for Backflow Prevention Assemblies and Air Gaps

5.1 Requirements

Rules and Regulations Section G, Rule 5, sets forth the requirements for testing, inspection, and repair of BPAs and Air Gaps:

- All testing, inspections, and repairs of BPAs or Air Gaps must be conducted at the sole expense of the property owner.
- Property owners must ensure that their BPAs and Air Gaps are inspected and/or tested at least annually and are in proper working order.
- BPAs:
 - BPAs must be tested by an Authorized Tester following installation, repair, depressurizing for winterizing, or permanent re-location, and at least annually thereafter. The SFPUC may also require more frequent testing if determined to be necessary. Property owners must comply with all such testing requirements. The list of Authorized Testers is available at www.sfpuc.gov/backflow.
 - In case of failure of a field test, BPAs must be repaired or replaced within 30 days of notification of the failure and immediately retested before being placed into service. If a BPA cannot be repaired or otherwise made functional on the same day as the initial field test, the Authorized Tester must report the test data to WQD by the close of business on that same day. The SFPUC may allow an extension of the 30-day requirement for repair or replacement at the SFPUC's sole discretion.
 - In case a BPA has been modified, the Authorized Testers who identified the modification must notify WQD by the close of business on the same day.
- Air Gaps:
 - All Air Gaps must be visually inspected by an Authorized Tester or Authorized Specialist at least annually. The SFPUC may require more frequent inspections if determined to be necessary. Property owners must comply with all such requirements.
 - If an inspection reveals that an Air Gap is not in compliance with the requirements of Chapter 6 of the California Plumbing Code, the Authorized Tester or Authorized Specialist that conducted the inspection must report the deficiency to WQD by the close of business on that same day.
 - Property owners must have their Air Gaps inspected and repaired when notified by the SFPUC to do so.
 - After a BPA or Air Gap has passed a test/inspection, the Authorized Tester or Authorized Specialist (Air Gaps only) must affix a backflow tag to it. (See Section 11 of this Manual.)

5.2 Notifying Customers When Assemblies Must Be Tested

WQD mails customers notices at the beginning of the month in which testing is due. Test results are due by the end of that month. If test results are not received by the end of the month, WQD sends out a second notice requiring testing within 15 days. If test results are not received by the end of the month, the case is referred to SFDPH-EH, which issues a Final Notice to Provide Proof of Testing. If test results are not received by the deadline, WQD and SFDPH-EH may proceed with enforcement, as described in Section 20 of this Manual.

Property owners are responsible for ensuring that their CSB contact information is up to date (CSB can be reached at 415-551-3000). The notices include “Backflow Prevention Assembly Information” form(s), which contain information about the BPA(s) for reference by the Authorized Tester. If a customer cannot or chooses not to meet with the Authorized Tester on site to provide the form(s), the Authorized Tester can use the Personal Identification Code (PIC) number listed on the notice to obtain the forms directly from WQD.

Customers may authorize their Authorized Testers via email to get PIC numbers directly from WQD. If a test company notifies its customers via email that their assemblies need testing, the test company can copy *backflow@sfwater.org* on the original message and ask the customer to “reply all” to authorize the release of the numbers. PIC numbers are emailed to Authorized Tester within one working day.

Authorized Testers must enter test results into the Cross-Connection Control Program’s MIS within five business days of the test date. Authorized Testers must provide customers with proof that the forms have been submitted as required.

5.3 Assignment of Assembly Test Month

The test month (compliance month) is the same as the month in which the BPA was initially tested. However, if an initial test was done in November or December, WQD changes the compliance month to October for administrative reasons. Customers may ask to have a compliance month changed, for example, so that all assemblies at a single address are due for testing at the same. To change a compliance month, customers must contact WQD at 650-652-3199.

When changing the compliance month, WQD allows a two-month grace period, so that a BPA might go up to 14 months between tests, rather than the usual 12 months. If the difference between the initial and desired compliance month is more than two months, then the BPA must be tested in less than 12 months, or possibly twice in one year, to transition the test month to the desired schedule. For example, if the initial compliance month is June and the desired compliance month is:

- March (three months earlier than the initial test month). Time between initial test and subsequent test: 9 months.
- August (two months later than the initial test month). Time between initial test and subsequent test: 14 months.

**Testing, Inspection, and Repair Requirements
For Backflow Prevention Assemblies and Air Gaps**

- September (three months later than the initial test month). Time between initial test and subsequent test: 3 months. The BPA must be tested twice in the transition year.

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6 Backflow Prevention Assembly Test Tags

Backflow tags are sold by the SFPUC CSB, located on the first floor of 525 Golden Gate Avenue, San Francisco. Tags may be purchased by Authorized Testers, Authorized Specialists, and Authorized Representatives of testing companies. CSB accepts payments by cash (in person only), company or cashier's check made out to the SF Water Department, and money order. No personal checks or credit cards are accepted.

To purchase tags in person, buyers must provide official identification (e.g., driver's license), name of the company they represent, and payment. Tags obtained in person may be purchased in any amount. To purchase tags by mail, the buyer must mail a purchase request form (link available at sfpuc.gov/backflow) with payment to CSB, San Francisco Public Utilities Commission, 525 Golden Gate Avenue, 2nd Floor, San Francisco, CA 94102. The request may also be deposited in the night mailbox outside the entrance of 525 Golden Gate Avenue. SFPUC recommends deposits by 8 am for fastest service. CSB mails the tags by certified mail within five business days of receiving the request. Mail orders require a minimum purchase of 10 tags.

Backflow tag exchange: In December and the following January, WQD may allow test companies to make a one-time exchange of up to 100 unused backflow tags for an equivalent number of tags with the following year's date. The allowed exchange is 100 tags per company made using one form (not 100 tags per Authorized Tester). To make an exchange, purchasers must fill out the "Request to Exchange Backflow Tags" (link available at sfpuc.gov/backflow) and mail it to or drop it off at CSB with payment. All exchanges must be made by mail. Example SFPUC forms for the purchase and exchange of backflow tags are included in Appendix F.

The cost of backflow tags is set forth in the SFPUC's *Rate Schedules & Fees for Water and Sewer Service*, Schedule W-45, which is available on the SFPUC website (<https://www.sfpuc.gov/accounts-services/water-power-sewer-rates/rates>). The fee for backflow tags is subject to change at the beginning of each fiscal year (July 1 to June 30).

7 Hazard Assessments

7.1 Historical Assessments

The SFPUC has historically conducted hazard assessments in the following circumstances:

- All new service connections,
- Whenever there is reason to believe that a cross-connection incident might have occurred,
- Whenever there is reason to believe there have been changes in the activities or materials used on a user's premises, and
- When notified by CSB of reverse consumption.

These assessments, if documented, are considered initial hazard assessments for the purposes of compliance with the CCCPH. The SFPUC has MIS records of hazard assessments dating back to 2019 and scanned paper records dating to at least 2008.

If backflow protection is required (usually a BPA), existing procedures ensure they are correctly installed and maintained. The SFPUC requires protection that meets the degree of hazard based on the results of hazard assessments.

New water service: Applicants for new water service must complete and submit a Backflow Prevention Application Form (Appendix F), which requests information about potential hazards. The form is reviewed by one of the SFPUC's WQD Inspectors, all of whom maintain certifications as cross-connection control specialists and BPA testers. The WQD Inspector determines whether and what kind of backflow protection is required at the service connection. The SFPUC does not provide permanent water service until WQD has confirmed that the proper protection has been correctly installed.

Potential cross-connection incidents: Potential cross-connection incidents usually come to the attention of the SFPUC via consumer complaints. The SFPUC received 457 complaints related to water quality in 2024. WQD Inspectors investigate all complaints. Usually, about two-thirds of complaints are handled over the phone. In roughly one-third of complaints, a WQD Inspector meets with the customer, investigates the complaint, and collects water samples for analysis. If necessary, the WQD Inspector determines whether and what kind of backflow protection is required. However, backflow protection is rarely required based on consumer complaints.

Changes in activities on user premises: The SFPUC reassesses the hazard to the public water system after becoming aware of changes in the activities or materials used on a water user's premises.

Reverse consumption: CSB sends WQD monthly reports of water meters credibly moving backwards (transmitted automatic metering infrastructure, or AMI, data are not always accurate) at a rate of at least 0.25 centum cubic feet (187 gallons) per day. Negative consumption suggests that water is flowing from a property back into the public water system. WQD Inspectors review the AMI data, considering volume, amount of time, frequency, and service size and type. If necessary, WQD will conduct hazard assessments and require backflow protection at the service connection if required.

7.2 Approach to Hazard Assessments

7.2.1 Purpose of Assessments

The purpose of hazard assessments is to identify the degree of hazard that user premises pose to the public water distribution system and ensure that appropriate backflow protection is provided. Service connections are designated as high hazard, low hazard, or no hazard. The SFPUC requires backflow protection at the water user's service connection that is commensurate with the identified degree of hazard.

7.2.2 Considerations for Assessments

In conducting hazard assessments, the SFPUC considers:

- Existence of cross-connections.
- Type and use of materials handled and present, or likely to be, on the user premises.
- Degree of piping system complexity and accessibility.
- Access to auxiliary water supplies, pumping systems, or pressure systems.
- Distribution system conditions that increase the likelihood of a backflow event (e.g., hydraulic gradient differences impacted by main breaks and high water demand situations, multiple service connections that may result in flow-through conditions).
- User premises accessibility.
- Previous backflow incidents on the user premises.

Based on these considerations, the SFPUC identifies the degree of hazard, determines whether an existing BPA, if any, provides adequate protection, and if not, requires installation of a BPA or Air Gap that is commensurate with the hazard.

7.2.3 Prioritization of Assessments

For standard, irrigation, and combination service connections, hazard assessments are prioritized as listed below. Dedicated fire services are discussed separately in Section 8 of this Manual.

1. SFPUC properties and facilities
2. Other CCSF-owned properties and facilities
3. Commercial, industrial, and large multi-family residential customers (at least five units)
4. Uncategorized services (these will be identified and put into one of the other four categories)
5. Small multi-family residential customers (up to four units)
6. Single-family residential customers

In addition, the SFPUC will conduct hazard assessments of all non-fire service connections at a property when upgrading fire services (Section 8). The prioritization above is based on CCCPH requirements and the potential threat to the public water system. Single-family residential

customers, which comprise about 86 percent of all services, are expected to pose the least risk to the public water system.

The SFPUC will complete initial hazard assessments within 25 years from the effective date of the CCCPH (i.e., by June 30, 2049). The SFPUC will hire additional staff to meet this deadline.

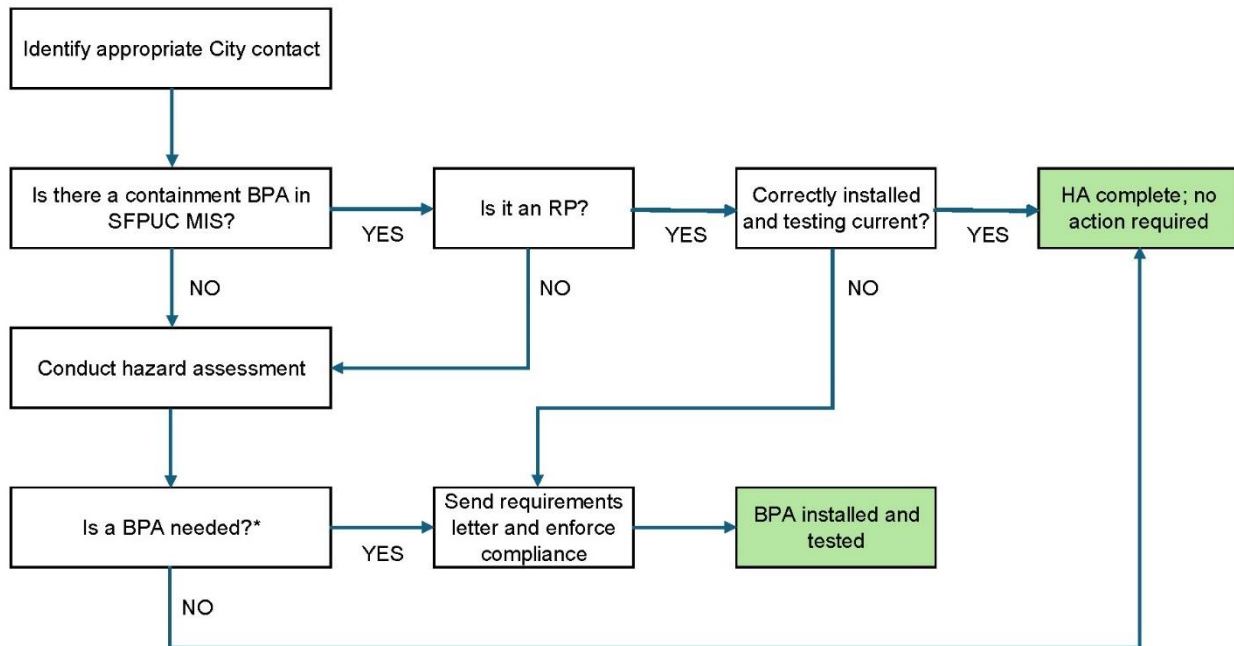
In addition, the SFPUC conducts hazard assessments if:

- A user premises changes account holder (excluding single-family residential services: note that the SFPUC considers historical residences that have been split into two, three, or four units to be to be “single-family” for the purposes of this requirement.)
- User premises newly connected or re-connected to the public water system.
- The SFPUC becomes aware of changes in the activities or materials on a user’s premises.
- Backflow from a user’s premises occurs.
- The SWRCB requests one.
- The SFPUC has reason to believe an existing hazard assessment may no longer accurately represent the degree of hazard.

7.2.4 Assessments of SFPUC and Other CCSF-Owned Properties and Facilities

The SFPUC will send a letter to all CCSF agencies requesting their full cooperation in its performance of the hazard assessments. The SFPUC will use CSB data to compile a list of service connections registered to the SFPUC and other CCSF-owned properties and facilities. The SFPUC will compare the list to its database of existing BPAs and identify the service connections that are not protected by either an RP or DC, depending on the level of hazard. If a service connection has an RP that is correctly installed and current with required annual inspection and testing, WQD will consider the hazard assessment complete.

If a service connection has an RP that is not correctly installed or overdue for testing, a DC, or no protection, the SFPUC will seek additional information to assess the hazard and conduct further investigations, which could include reviewing water consumption (and negative consumption) data and building permits; using Google Maps Street View to determine building height and potentially property use; or consulting the SFPUC’s list of past cross-connection incidents. If the SFPUC cannot obtain sufficient information for an accurate hazard assessment, the customer may be required to install an RP at the service connection. The process for assessing SFPUC and other CCSF-owned properties and facilities is illustrated in Figure 7-1.



* If hazard cannot be determined, an RP may be required.

Figure 7-1. Flow Chart for SFPUC and Other CCSF-Owned Properties and Facilities

7.2.5 Assessments of Commercial, Industrial, and Multi-Family Residential Customers

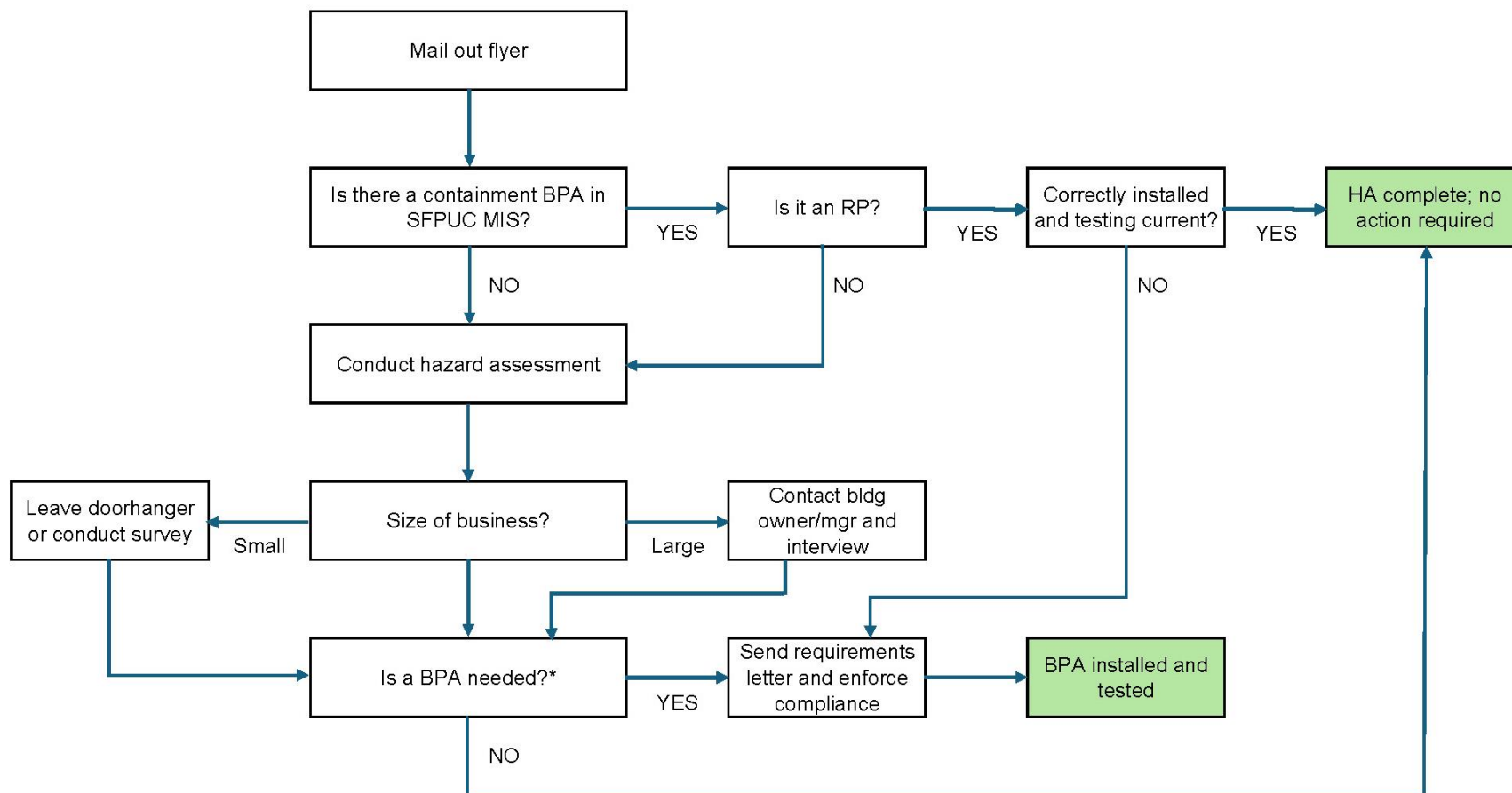
In 2022, SFPUC prepared a technical memorandum⁶ that prioritized (by hazard) 9,405 commercial and multifamily residential water service connections associated with 8,229 accounts that used over 100 centum cubic feet, or 74,800 gallons, in 2019. Service connections were ranked by hazard based on Standard Industrial Classification codes and water use in 2019. For the higher-risk accounts, the SFPUC's database of BPAs was reviewed to see if the service connections were protected by BPAs. Unprotected properties were looked up on Google Maps Street View, and a list of buildings four or more stories high was compiled (the hydraulic pressure of water over 40 feet above a service connection can cause backflow into the public water system under certain conditions). The results of the study set the priority of hazard assessments for commercial, industrial, and multi-family residential customers.

To conduct hazard assessments, the SFPUC will mail property owners a postcard asking that they complete an online survey (Appendix F). Customers will also be contacted by email if possible. The SFPUC will complete a pilot study of residential and commercial services in 2026 to evaluate how much response the postcards generate and how accurate the information provided is likely to be.

WQD Inspectors will review customer responses and conduct further research as described in Section 7.4.2 above. If a service connection has an RP that is correctly installed and current with required annual inspection and testing, the SFPUC will consider the hazard assessment complete. If a service connection has an RP that is not correctly installed or overdue for testing, a DC, or no protection, the SFPUC will seek additional information and conduct further investigations. The SFPUC may approve existing internal protection in lieu of containment when it provides

adequate protection for the hazard. The SFPUC may approve future internal protection in lieu of containment when it provides adequate protection for the hazard and premises containment is not feasible due to site conditions.

If a customer does not respond to the postcard and complete the online survey form, the SFPUC will follow up with the property owner. In the case of small businesses, such as an auto shop, WQD staff will visit the premises and leave a door hanger requesting the completion of the online survey form. If the customer is amenable to talking and the staff person is a WQD Inspector, the WQD Inspector can gather the survey information in person. For larger customers, such as multi-family residences or commercial offices, the WQD Inspector will schedule a call or site visit with the building manager. If the SFPUC cannot obtain sufficient information for an accurate hazard assessment, the SFPUC may require the customer to install an RP at the service connection. The process for assessing commercial, industrial, and multi-family residential customers is illustrated in Figure 7-2.



* If hazard cannot be determined, an RP may be required.

If the SFPUC made contact with the property owner/customer during the hazard assessment, the SFPUC will send a letter indicating that no hazards were identified and no action required.

Figure 7-2. Flow Chart for Commercial, Industrial, and Multi-Family Residential Customers

7.2.6 Assessments of Single-Family Residential Customers

The SFPUC will mail property owners a postcard asking that they complete an online survey (Appendix F). Property owners will also be contacted by email if possible. The SFPUC will complete a pilot study in 2026 to evaluate how much response the postcards generate and how accurate the information provided is likely to be. Response rates are expected to be low, with significant outreach and multiple requests needed to get a moderate response. In almost all cases, single-family residential customers do not have existing backflow protection at the service connection.

WQD Inspectors will review customer responses. If a customer does not respond to the postcard and complete the online survey form, a doorhanger will be left at the residence requesting the completion of the online survey form. If a service connection has an RP that is correctly installed and current with required annual inspection and testing, the SFPUC will not survey these customers and consider the hazard assessment complete. If a service connection has an RP that is not correctly installed or overdue for testing, a DC, or no protection, the SFPUC will seek additional information and conduct further research as described in Section 7.4.2 of this Manual. In addition, WQD Inspectors will:

- Confirm building use (residential or not) and height either using Google Maps Street View or conducting an in-person drive-/walk-by inspection.
- Check the size of the service line: Most homes have a 1-inch service line and a 5/8-inch water meter. Larger meters suggest that the property might not be a single-family home or duplex. Combination standard/fire services also have larger meters.

If residential use is confirmed, the building is less than four stories high, and if there is no negative consumption or other indication of hazard (e.g., SFDBI-PID permit for installation of a hydronic heating system, alternative water supply such as rainwater plumbed for interior use, unusual water use), the hazard assessment will be considered complete, and no further action is required. If a building is four or more stories high or has documented negative consumption, a DC is required at the service connection.

If the residential property has an unknown commercial use, the WQD Inspector will request contact information for the owner/manager; the information will be passed on to the SFDPH-EH so that the SFDPH-EH Senior Inspector supporting the Cross-Connection Control Program can follow up and assess hazards associated with the property. The process for assessing single-family residential customers is illustrated in Figure 7-3.

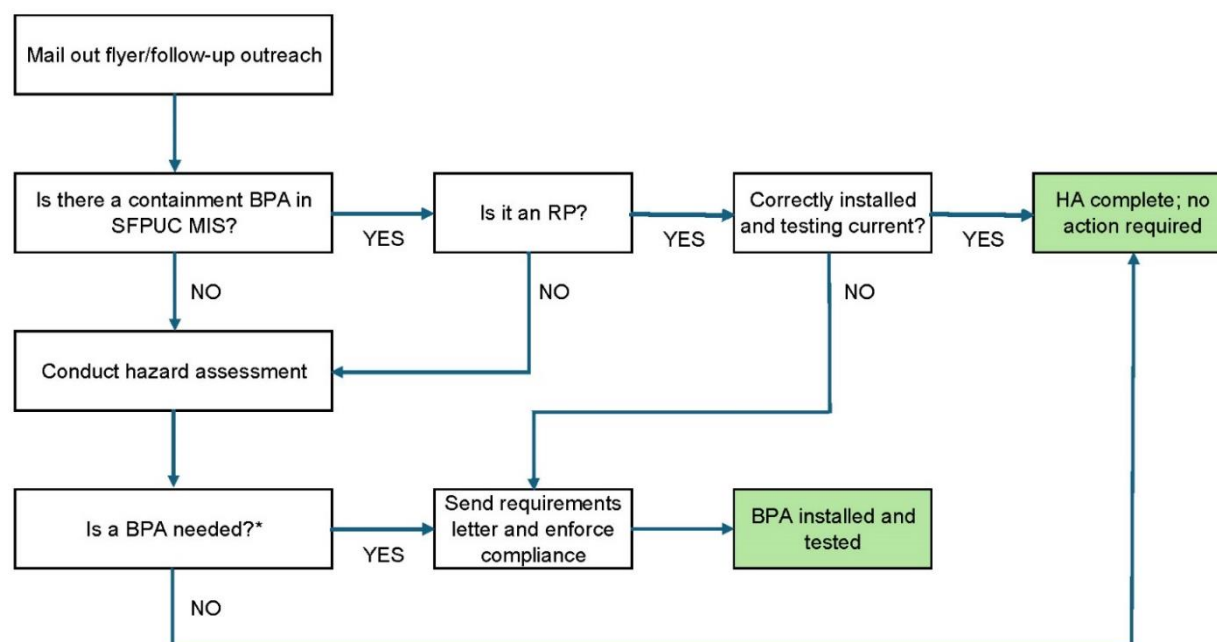


Figure 7-3. Flow Chart for Single-Family Residential Customers

7.3 Written Findings

A WQD Inspector certified as a cross-connection control specialist reviews or conducts all hazard assessments and makes a written finding that assessments properly identified all hazards at the time of the assessment, the appropriate degree of hazard, and the corresponding required backflow protection (Hazard Assessment Form in Appendix F).

7.4 Timeframe for Customer Installation of Backflow Protection

When the SFPUC concludes after a hazard assessment that backflow protection is needed, the SFPUC sets due dates for compliance based on the hazard and site-specific circumstances. For example, for an expensive installation, a customer might need to include the cost of the installation in an annual budget. 7-1 summarizes timelines for compliance.

Table 7-1. Proposed Time for Customers to Install Backflow Protection

Risk Level	Deadline	Potential Extension with Mitigation
Ongoing hazard ¹	ASAP	TBD
High hazard	≤ 1 year	Additional year*
Other hazard	1 year	Additional 2 years*

Note 1: For example, ongoing documented backflow.

ASAP = As soon as possible

TBD = To be determined by the SFPUC on a case-by-case basis

**The SFPUC may grant additional extensions under extraordinary situations in which the property owner is acting in good faith.*

7.5 Reassessments of Service Connections

For subsequent surveys after the initial surveys, if a service connection has an RP that is current with required annual inspection and testing, and there are no indications of change in property/water use, the SFPUC will consider the hazard assessment complete. Otherwise, the SFPUC will follow the procedures described above. For community water systems, the SFPUC will complete reassessment hazard assessments within the next 20-year period after the initial hazard assessments have been completed (i.e., between July 1, 2049, and June 30, 2069). For noncommunity water systems, the SFPUC will conduct a follow-up hazard assessment of its water distribution system if any changes are made that could result in a cross-connection or any backflow incidents occur.

8 Upgrading Protection on Dedicated Fire Services

8.1 Scope of Upgrades

As of July 2025, an estimated 4,236 dedicated fire services in San Francisco are only protected by swing-check valves. These fire services are spread out over the City but are concentrated in the northeast and other financial/commercial areas. Upgrading dedicated fire services involves removing existing swing-check valves (owned by the SFPUC) and installing DCDAs or RPDAs (to be owned by the property owner). The process involves various entities. As an exceptional compliance alternative, the SFPUC may approve tandem check valves if the customer has significant site constraints, agrees to have the devices inspected at least every five years, and has devices repaired or replaced as necessary.

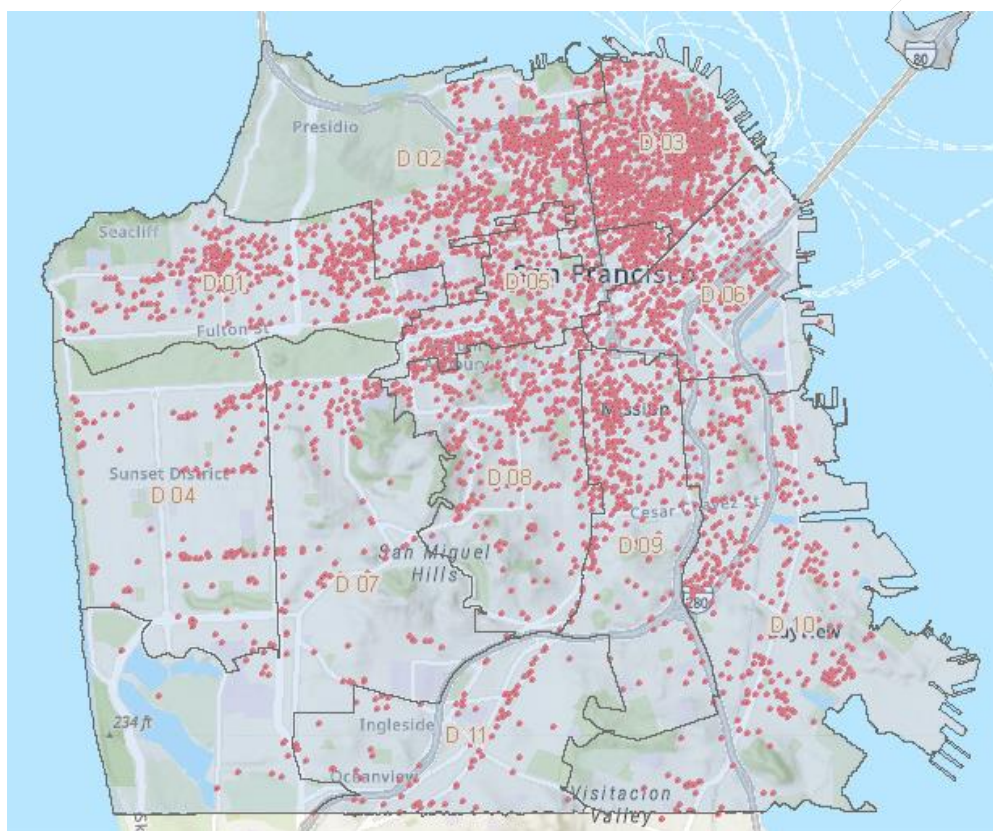


Figure 8-1. Locations of Fire Services Without DC/RP Protection

Property owners required to upgrade their fire service protection must:

- Hire a contractor to conduct a hydraulic analysis to ensure that their sprinkler systems will have adequate water supply after installation of a DCDA, since the DCDA has higher friction losses than a fully functional swing-check valve.
- Obtain approvals and permits from the SFFD and SFDBI-PID.

- Identify sufficient space to install DCDAs, since most non-residential structures (most likely to have dedicated fire services) and many residences are built out to the property line.
- Fund the DCDA installation. Costs could range from \$5,000 to over \$50,000, depending on service size and ease of installation. These estimates do not include installing booster pumps or increasing the size of fire service pipelines if necessary to achieve adequate supply for the property's fire suppression system.
- Coordinate with the SFWD to have swing-checks removed at the time of DCDA or RPDA installation.

Guidance for property owners upgrading their fire services is included in Appendix G.

SFWD will pull existing swing-checks in coordination with the installation of DCDAs or RPDAs. The level of effort will depend upon the size and location of the swing-check, e.g., accessible in a basement or under a sidewalk.

SFFD will review and approve all upgrade plans.

SFDBI-PID will inspect installations.

WQD will:

- Prioritize fire services to be upgraded. This will be done based on the date of service installation (older swing-checks are more likely to fail) and size of service line (larger service lines are associated with more extensive sprinkler systems, which have larger volumes of water that could backflow into the public water system).
- Communicate with customers about the need for DCDA installation and timing.
- Conduct site visits of each installation to approve location and correct installation.
- Possibly approve variances from requirement that DCDAs or RPDAs be within 25 feet of point of connection.

8.2 Timeframe for SFPUC Compliance

The CCCPH requirement is for all dedicated fire services to be protected by DCs or RPs by June 30, 2034. The SWRCB has granted the SFPUC a five-year extension, to June 30, 2039, to complete these upgrades. The extension is needed due to the number of services to be upgraded, cost, and complexity of the work. WQD will hire additional cross-connection control specialists, engineers, and administrative staff to complete the upgrades by the 2039 deadline.

9 Upgrading Protection on Hydrants

SFWD issues “hydrant meter equipment” for temporary uses such as construction, special events like music festivals, and commercial vehicles like street sweepers and water trucks. Currently, the equipment includes a water meter and swing-check valve for backflow protection. The CCCPH requires RPs on hydrants for temporary uses. SFWD will procure about 300 RPs, costing approximately \$1 million, and issue them as part of hydrant meter equipment. The SFPUC plans to upgrade all such equipment with RPs by June 30, 2027. An extension may be required if supply chain problems occur.

At least one SFWD staff will maintain a certification as a BPA tester so that SFWD can maintain the RPs. SFWD staff and certifications are included in Appendix B. SFWD will set up tracking systems to document that the RPs are tested regularly. The SFPUC will require inspections and testing of hydrant RPs whenever the equipment is returned to SFWD or every six months, whichever is sooner. The SFPUC will track inspection and test results in its MIS.

10 Inspection of New Water Services

As set forth in Rules and Regulations Section G, Rule 7, all new water services that require a BPA or Air Gap at the point of connection under San Francisco Health Code Article 12A and Rules and Regulations Section G must receive and pass an initial and final inspection by WQD. The property owner shall call WQD at 650-652-3199 to schedule these inspections in the timeframes specified below. These inspections are separate from those required by other CCSF departments for other purposes.

WQD Inspectors conduct initial inspections after the installation of a BPA or Air Gap at the point of connection. The SFPUC does not provide a water service line and meter until the BPA or Air Gap has passed the initial inspection. SFDBI-PID ensures that BPAs have passed testing before signing off on plumbing permits.

WQD Inspectors conduct a final inspection within 48 hours of the start of customers receiving water service. If this inspection is not conducted within this timeframe, water service will be turned off and will not be restored until the final inspection has been passed. On a case-by-case basis, WQD Inspectors can delay service turnoffs if the user premises do not pose a significant risk.

The fee for WQD inspections is set forth in the SFPUC's *Rate Schedules & Fees for Water and Sewer Service*, Schedule W-41A, which is available on the SFPUC website (<https://www.sfpuc.gov/accounts-services/water-power-sewer-rates/rates>) and is subject to change at the beginning of each fiscal year.

11 Permits to Operate as an Authorized Backflow Prevention Assembly Tester or Authorized Cross-Connection Control Specialist

As set forth in Rules and Regulations Section G, Rule 8, a valid permit to operate as an Authorized Tester is required for any person to test BPAs at a property. A valid permit to operate as an Authorized Specialist is required for any person to conduct hazard assessments and cross-connection tests at a property. A person may apply for a permit to operate as either an Authorized Tester or an Authorized Specialist. A person that seeks a permit to operate as both an Authorized Tester and an Authorized Specialist must submit two separate applications for two separate permits to operate. To apply for a permit to operate, an applicant shall:

- Submit a completed application form and application fee as instructed on the SFPUC's website at sfpuc.gov/backflow.
- Provide a copy of the Applicant's current certification as a BPA tester or a cross-connection control specialist, as applicable, from one of the organizations approved by the SFPUC. A list of these organizations is included in Appendix H and will be updated as needed.
- Provide proof of use of a calibrated test kit (Authorized Testers only).
- Provide proof that the applicant's certificate of general liability insurance is in full force and effect, at the applicant's expense, for all activities to be performed under the permit to operate. Such insurance must include coverage for bodily injury, personal injury, including death resulting therefrom, and property damage (including water damage) insurance, with limits not less than \$2 million each occurrence combined single limit. The CCSF, its officers, and employees shall be named as additional insureds under the policy, and a cross-liability clause shall be attached. Such insurance must provide 10-day prior written notice of cancellation, non-renewal, or material change to the SFPUC. CCSF employees are exempt from this requirement to provide proof of general liability insurance as a condition of permit issuance.
- Complete a written examination administered by the SFPUC or SFDPH-EH with a passing grade of at least 70 percent.

Permit approval and issuance: The decision whether to approve or deny any application for a permit to operate is at the sole and absolute discretion of the SFPUC. Upon approval, applicant information is forwarded to the CCSF's Office of the Treasurer and Tax Collector, which accepts the applicant's payment of the license fee. The permit to operate is issued upon the applicant's payment of the license fee.

The duration of a permit to operate is one year. To maintain a permit to operate in good standing, the permittee shall:

Permits to Operate as an Authorized Tester or Specialist

- Maintain a current certificate of competency and current general liability insurance meeting the requirements as described above. If an Authorized Tester, the permittee must also maintain proof of use of a calibrated test kit.
- Notify WQD within 24 hours of becoming aware of either of the following conditions:
 - The permittee's certificate of competency has expired or been revoked.
 - The permittee's general liability insurance has been cancelled, not renewed, or changed materially.
- Maintain all documentation required under Rules and Regulations Section G and any other local or state law or regulation and make all such documentation available for inspection at the request of the SFPUC.
- Attend WQD's Annual Meeting for Authorized Testers and Authorized Specialists or complete alternative annual training provided by WQD.
- Comply with all other requirements of Rules and Regulations Section G, San Francisco Health Code Article 12A, and any other applicable rule or legal requirement under local, state, or federal law.
- Follow all procedures in the WQD's Instructions for Authorized Testers (Appendix I).

Annual renewal: To annually renew a permit to operate, the permittee shall:

- Possess a permit to operate in good standing.
- Pay the license fee to the CCSF's Office of the Treasurer and Tax Collector before the current expiration date of the permit to operate.
- Provide to WQD before the current expiration date of the permit to operate:
 - A copy of the permittee's renewed certificate of competency, if the previous certificate has expired.
 - A certificate of general liability insurance in full force and effect meeting the requirements described above.
 - Proof of use of a calibrated test kit (Authorized Testers only).

No transfer: Permits to operate are issued to individual persons and are not transferable. If a permittee ceases to work for an employer that held the permittee's certificate of liability insurance, the permittee shall submit to WQD within five business days valid evidence of liability insurance, as described above, to maintain a valid permit to operate.

Suspension and revocation of permits to operate:

- The SFPUC may suspend or revoke any permit to operate upon a determination that the permittee has failed to meet any of the requirements in this section; has violated any other requirement of Rules and Regulations Section G or San Francisco Health Code Article 12A; has engaged in conduct in connection with activities covered by the permit to operate that violates other local, state, or federal laws; or has made a material misrepresentation when applying for a permit to operate.

- Before the suspension or revocation of any permit to operate, the SFPUC will issue a written notice to the permittee at the permittee's address on record specifying the reason why the SFPUC intends to suspend or revoke the permit to operate and provide the Permittee with an opportunity to challenge the suspension or revocation in accordance with the administrative review procedure outlined in Section 21 of this Manual. Notwithstanding the foregoing, the SFPUC may immediately suspend any permit to operate pending a noticed hearing on suspension or revocation when, in the opinion of the SFPUC, the public health or safety requires such immediate suspension. The SFPUC will issue written notice of such immediate suspension to the Permittee in person or by registered letter to the Permittee's address on record.

Appeals: The final decision of the SFPUC to grant, deny, suspend, or revoke a permit to operate in accordance with Rules and Regulations Section G may be appealed to the San Francisco Board of Appeals in the manner prescribed in San Francisco Business and Tax Regulations Code Article 1.

12 Companies Employing Authorized Backflow Prevention Assembly Testers and Authorized Cross-Connection Control Specialists

As set forth in Rules and Regulations Section G, Rule 9, companies that employ Authorized Testers and Authorized Specialists shall:

- Provide to the SFPUC a business name, contact phone number and email address, website, and proof of liability insurance meeting the requirements of Rules and Regulations Section G and Section 11 of this Manual.
- Maintain general liability insurance in full force and effect, at company expense, for all activities performed by the Authorized Testers and Authorized Specialists that they employ. Such insurance must include coverage for bodily injury, personal injury, including death resulting therefrom, and property damage (including water damage) insurance, with limits not less than \$2 million each occurrence combined single limit. The CCSF, its officers, and employees shall be named as additional insureds under the policy, and a cross-liability clause shall be attached. The insurance shall provide for a 10-day prior written notice of cancellation, non-renewal, or material change to WQD.
- Provide the names and certification numbers of each Authorized Tester and Authorized Specialist that the company employs at the time of registration. Companies shall notify the SFPUC by email within five business days of an Authorized Tester or Authorized Specialist's first or last day of employment.
- Maintain continuous records of all activities that the company and the Authorized Testers and Authorized Specialists that it employs perform in relation to backflow prevention for a period of four years. These records must include the dates and locations of all tests, repairs, and inspections of Backflow Preventers; Hazard Assessments and Cross-Connection Tests; and the names of the individuals who performed them. Companies must make these records available to the SFPUC within five business days of the SFPUC's request.

Companies may designate up to two people to act as Authorized Representatives for the purchase of backflow tags on behalf of the company. Companies shall provide written notice to WQD of the names of each Authorized Representative as well as written notice of any changes in designation when they occur.

13 Public Outreach Program

The SFPUC maintains a website for its Cross-Connection Control Program (sfpuc.org/backflow). The website includes the latest version of this Manual, as well as information for customers, contractors, the Authorized Tester and Authorized Specialist community, and other SFPUC entities. The SFPUC is expanding its public education by coordinating with the SFPUC's Communications Division to conduct pro-active outreach. The SFPUC is a member of the California Urban Water Association, which has developed public information materials that may be posted to the website and used in public outreach efforts. The SFPUC has prepared outreach materials to inform the public about upcoming hazard assessments, which will entail mailing survey forms to customers. Mailings will provide a link and QR code to the SFPUC's website. Information about the survey and backflow prevention has also been included in this year's Consumer Confidence Report. Future outreach methods may include, but are not limited to, bill inserts, door hangers, digital and print newsletters, and periodic social media posts.

The SFPUC regularly coordinates with stakeholder groups. Various CCSF entities (WQD, SFDPH-EH, SFDBI-PID and SFFD) meet monthly to discuss cross-connection control issues. The SFPUC has formed an advisory committee consisting of members of the local Authorized Tester/Authorized Specialist community. The SFPUC meets with the committee at least once a year to discuss Authorized Tester/Authorized Specialist issues of concern or changes in the SFPUC's Cross-Connection Control Program (e.g., how the CCCPH affects the program). The SFPUC and SFDPH-EH host an annual meeting for Authorized Testers and Authorized Specialists to inform them about important program developments or issues.

14 Inspection and Testing Requirements for Dual-Plumbed Systems

14.1 Auxiliary Water and Required Backflow Protection

Auxiliary water includes, but is not limited to graywater, wastewater, black water, groundwater, rainwater, and municipally supplied recycled water. CCSF requires the use of on-site auxiliary (non-potable) water in new developments above certain size thresholds. In addition, CCSF will provide recycled water to several areas of San Francisco for irrigation and other non-potable uses, such as toilet and urinal flushing, lake recharge, decorative fountains, and concrete mixing and processing.

Any property with an auxiliary water system must have an RP at the point of connection (Table-3-1). In addition, an Air Gap must be installed where potable makeup water supplies an auxiliary water storage tank or directly supplies the auxiliary water system. A swivel-ell may be used instead of an Air Gap for premises containment protection when temporarily substituting tertiary recycled water use areas with potable water from the public water system, as long as the requirements in Section 14.4 are met. Note: The requirements of this section do not apply to residential rainwater and graywater systems that are used exclusively for outdoor irrigation and are not interconnected with the potable water system.

14.2 Inspection and Testing Requirements

As set forth in Rules and Regulations Section G, Rule 10:

- All inspections, testing, and repairs of dual-plumbed systems must be conducted at the sole expense of the property owner.
- Before being put into service, all dual-plumbed systems must pass an initial inspection and cross-connection test supervised by an Authorized Specialist in the presence of a WQD Inspector. The initial cross-connection test must be a shutdown test. Instructions for conducting cross-connection tests are provided in Section 15 of this Manual.
- After the initial inspection and cross-connection test, property owners must conduct cross-connection tests of dual-plumbed systems with the frequency set forth in Table 14-1. Subsequent cross-connection tests must be shutdown tests, unless a property owner submits a request in writing to the Director of WQD to conduct a pressure differential test in lieu of a shutdown test, and the Director approves the request, at the Director's sole discretion. Property owners must also conduct additional inspections and cross-connection tests under the following circumstances:
 - Whenever directed by the SFPUC to do so.
 - Whenever there is material reason to believe that the separation between the property's potable and non-potable systems has been compromised, for example, based on a visual inspection or following water quality complaints.
 - Immediately after remediation of a discovered cross-connection.

Table 14-1. Inspection and Testing Requirements for Dual-Plumbed Systems

Type of Auxiliary Water	Initial Inspection and Shutdown Test	Subsequent Cross-Connection Test ¹
Municipally supplied recycled water	Yes	Every four years (need not be shutdown test)
Blackwater	Yes	Every four years (need not be shutdown test)
Other auxiliary water supply	Yes	No

Note: California's onsite reuse regulations are still in draft form. The requirements for subsequent cross-connection tests could change, in which case, this table will be updated.

- All cross-connection tests for dual-plumbed systems must be administered by an Authorized Specialist in the presence of the User Supervisor for the property. The Authorized Specialist must submit a written report documenting the results of each test to WQD within five business days following completion of the test and include a verification within the report that the User Supervisor was present.
- Fees for cross-connection tests overseen by WQD are set forth in the SFPUC's *Rate Schedules & Fees for Water and Sewer Service*, Schedule W-45, available on the SFPUC website (<https://www.sfpuc.gov/accounts-services/water-power-sewer-rates/rates>) and subject to change at the beginning of each fiscal year.
- Any changes to auxiliary water systems must be done under permit from SFDBI-PID and in conformance with the requirements of the California Plumbing Code, the SFPUC Director's Rules and Regulations Regarding the Operation of Alternate Water Source Systems, SFPUC Rules and Regulations for Users Receiving Recycled Water Service in the City and County of San Francisco, San Francisco Health Code Article 12C, and any other state or local law or regulations, as applicable. In the case of conflicting requirements, the more stringent requirements apply. If the change to the auxiliary water system will alter the existing degree of hazard (e.g., a blackwater treatment system will be installed), the property owner must inform the SFPUC at least 30 calendar days before the change is made.
- Property owners must maintain records of all inspections and cross-connection tests of dual-plumbed systems on their properties for a period of four years and must make all records available to the SFPUC within five business days of the SFPUC's request.

14.3 Conversion of Existing Irrigation Systems from Potable to Non-Potable Sources

If an existing irrigation system is to be converted to the use of non-potable water, the irrigation system must pass a cross-connection (shutdown) test **before** connecting to the non-potable supply. The purpose of the test is to identify cross-connections between the existing irrigation system and the distribution system for potable supply. If cross-connections are found, they must be corrected, and the irrigation system must pass a cross-connection test before being connected

to the non-potable supply. After conversion, the irrigation system must pass an initial cross-connection test before being put into service, as described above.

14.4 Swivel-Ell Connections

14.4.1 Overview

SFPUC's requirements for swivel-ells are set forth in Rules and Regulations Section G, Rule 3(f). WQD will approve swivel-ell connections that conform to the requirements in the SWRCB's CCCPH. Alternatively, if design and construction plans deviate from CCCPH requirements but still protect the public water system from backflow, the SFPUC will submit the plans to the SWRCB for approval.

The SFPUC will inform the SWRCB on a monthly basis of any new swivel-ells installed within its water systems. WQD will notify the SWRCB within 24 hours of switchovers to or from potable water, provide an estimate of the timeframe until the next switchover, and provide the results of the testing of the RP associated with the swivel-ell. Within seven days of each switchover, if requested by the SWRCB, WQD will submit a written report describing compliance with the requirements of the CCCPH, as well as potable water and auxiliary water usage information.

14.4.2 Legally Binding Agreement

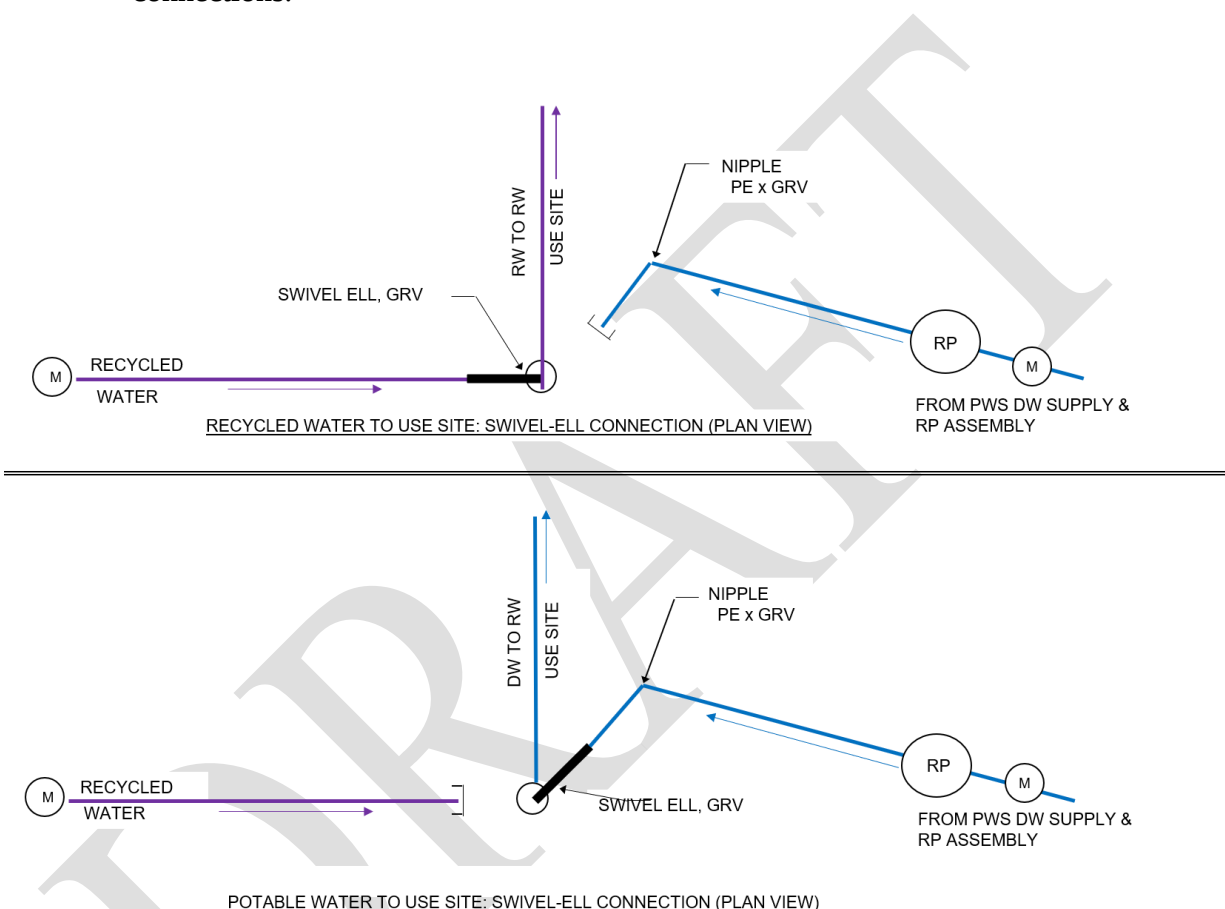
Property owners that install swivel-ells must enter into a legally binding agreement with the SFPUC regarding the design, construction, and operation of swivel-ells. These requirements are specified in the WQD's Rules of Service and Operation for Swivel-Ells, included in Appendix F, and are described in the subsections below.

14.4.3 Design and Construction Requirements

- The design and construction of the swivel-ell must conform to the requirements in the State Water Resources Control Board's CCCPH. Schematics of an acceptable design are reproduced from the CCCPH in Figure 14-1. After WQD approves the installation of a swivel-ell, no changes may be made to on-site plumbing without prior approval by WQD.
- The swivel-ell connection must be designed to ensure that the water use site associated with the swivel-ell cannot be supplied concurrently by the public water system and auxiliary water. Therefore, the public water supply line and the auxiliary water supply line must be offset in a manner to 1) preclude the use of a tee-connection, spool, or other prefabricated mechanical appurtenance(s) in lieu of the swivel-ell connection, and 2) prevent concurrent supply of potable water and auxiliary water.
- Only one source of auxiliary water may be used in conjunction with the swivel-ell assembly at a water use site.
- An RP must be installed immediately upstream of the swivel-ell. The swivel-ell and RP must be located within 25 feet of the point of connection. If this is not feasible, a second RP at the service connection is required.
- The swivel-ell assembly must be:

Inspection and Testing Requirements for Dual-Plumbed Systems

- Located above ground
- Color-coded pursuant to California Health and Safety Code §116815 and its implementing regulations
- Equipped with appropriate signage, as required by regulation and the SWRCB
- Provided the security necessary to prevent interconnections, vandalism, unauthorized entry, etc.
- Provided with meters on both the auxiliary water service and public water supply connections.



Legend:

RW	=	Recycled or other auxiliary water
DW	=	Drinking water originating from a public water system.
M	=	Meter
PE	=	Plain End
GRV	=	Groove
PWS	=	Public Water System

Source: California Cross-Connection Control Policy Handbook

Figure 14-1. Schematics of Typical Swivel-Ell Assembly (Plan View)

14.4.4 Operating Requirements

- Property owners must notify WQD at least 48 hours in advance of planned switchovers. For unplanned switchovers, property owners must notify WQD before the switchover is made and ensure that a WQD Inspector is present for the switchover. Contact WQD by calling Millbrae Dispatch at 650-872-5900 and asking to speak with a WQD Inspector.
- A WQD Inspector must be present to supervise each switchover and conduct a visual inspection of the swivel-ell immediately before each switchover (the WQD Visual Inspection Form is included in Appendix F). If the WQD Inspector identifies any changes made to the installation that would increase the hazard of the connection, the property owner must correct the deficiencies before the switchover may be made.
-
- At the time of the switchover, property owners must give the WQD Inspector an estimate of the time until the next switchover.
- If the switchover is from recycled water to potable water, the RP associated with the swivel-ell must be tested by an Authorized Tester within 72 hours of the switchover. The list of Authorized Testers is available at <https://www.sf.gov/backflow>.
- After the switchover to potable water, the RP must be tested by an Authorized Tester at least every 12 weeks while the water use site is supplied with potable water. In addition, the RP must be tested annually, whether or not potable water is supplying the water use site. WQD will notify the property owner when testing is due.
- Authorized Testers must enter RP test results into the SFPUC's MIS within five days of each test, unless the RP fails the test, in which case the results must be entered on the same day as the test. In addition, the Authorized Tester must inform WQD of the failure by calling Millbrae Dispatch at 650-872-5900 and asking to speak with a WQD Inspector. Depending on the type of failure, WQD may discontinue the potable water supply until the RP is repaired.
- If asked to do so by WQD, property owners must provide WQD with potable water and recycled water usage information, as well as any other information WQD requests. The information must be provided within three business days.

14.4.5 SFPUC's Swivel-Ell Installations

The SFPUC's approved swivel-ell installations are included in Appendix J.

15 Cross-Connection Tests for Standard and Dual-Plumbed Properties

15.1 Cross-Connection Tests

The purpose of cross-connection tests is to ensure that there are no physical connections between the potable and auxiliary water systems and that water fixtures are being served by the correct water source. Cross-connection tests must be conducted according to the procedures described below. If a system does not pass a test, then deficiencies must be identified and corrected. A cross-connection test must be passed before the auxiliary water system is put in service.

All properties with auxiliary water systems must pass an initial cross-connection test. An initial cross-connection test consists, at a minimum, of the shutdown test described in Section 15.2.1. A static or dynamic pressure differential test (Sections 15.2.2 and 15.2.3, respectively) might also be required, at the discretion of the SFPUC. The procedures required for subsequent cross-connection tests will be determined by the SFPUC on a case-by-case basis.

In new dual-plumbed buildings, a customer's account is not activated until the initial cross-connection test has been passed. If necessary, the property owner/contractor can coordinate with CSB and SFWD to arrange for a temporary connection to the potable water supply so that the auxiliary water system plumbing can be tested. At the conclusion of the test, the temporary connection to the potable water supply must be disconnected.

15.2 Procedures for Conducting Cross-Connection Tests

Initial cross-connection tests must be conducted by the property owner under the supervision of a WQD Inspector. Subsequent tests might not require WQD supervision, as determined by the SFPUC on a case-by-case basis, in which case property owners must hire an Authorized Specialist to supervise the tests. The building's User Supervisor must be present for all subsequent tests. Property owners should plan for at least three weeks of lead time for scheduling a cross-connection test requiring a WQD Inspector. In some cases, it might be advisable to consult with a licensed engineer with expertise in hydraulics and water system operation. If used, BPA test kits must be dedicated to testing auxiliary water; the kits may not be used on potable water systems.

No changes to these cross-connection test procedures may be made without prior approval by WQD. In all cases, property owners must provide WQD with their testing plans, which must be approved by WQD; plans must be submitted at least three weeks in advance of a test. Requirements for documenting cross-connection tests are included in Appendix K.

15.2.1 Shutdown Test

The shutdown test consists of the following steps:

1. Ensure that the potable water system is activated and pressurized.
2. Shut down and completely depressurize the auxiliary water system. The minimum period the auxiliary water system is to remain depressurized is to be determined on a case-by-

case basis, taking into account the size and complexity of the potable and auxiliary water distribution systems, but the minimum time period is one hour.

3. Test and inspect all fixtures, both potable and auxiliary, for flow. Flow from any auxiliary water system outlet indicates a cross-connection. Lack of flow from a potable water outlet indicates that it could be connected to the auxiliary water system.
4. Check the drain on the auxiliary water system for flow during the test and at the end of the test period.
5. Completely depressurize the potable water system.
6. Activate and pressurize the auxiliary water system.
For the initial test, a temporary connection to a potable water supply is needed to test the auxiliary water system plumbing. At the conclusion of the test, disconnect the temporary connection to the potable water supply.
7. The auxiliary water system is to remain pressurized while the potable water system is depressurized. The minimum period the potable water system is to remain depressurized is to be determined on a case-by-case basis, but the minimum time period is one hour.
8. Test and inspect all fixtures, both potable and auxiliary, for flow. Flow from any potable water system outlet indicates a cross-connection. Lack of flow from an auxiliary water outlet indicates that it is connected to the potable water system.
9. Check the drain on the potable water system for flow during the test and at the end of the test period.
10. If no cross-connection is confirmed, re-pressurize the potable water system. If a cross-connection is discovered, immediately activate the procedures described in Section 16 of this Manual, Emergency Cross-Connection Response Plan.

15.2.2 Static Pressure Differential Test

The static pressure differential test consists of the following steps:

1. Ensure water systems are fully operable and pressurized by observing flow/pressure at fixtures on both the potable (both hot and cold) and auxiliary water systems.
2. Make appropriate test connections to the potable (both hot and cold) and auxiliary water systems at the highest point of the water systems. The test connections must be accessible (i.e., at least 12 inches above the ground or floor with at least 12 inches of clearance on all sides) and be approved by WQD.
3. Fill a clear site tube on the auxiliary water system test connection and close the test connection valve. If the pressure is too high for a site tube, use a pressure gauge, preferably an electronic gauge with a digital readout.
4. Shut off and isolate the auxiliary water system. Open the auxiliary water vent valve to relieve pressure and note the static water level in the clear site tube (or gauge) by opening the test connection valve.
 - If the water level/pressure remains the same for at least ten minutes, note the auxiliary water system as tight/no cross-connection.

- If the water level recedes in the clear site tube or gauge, inspect the auxiliary water system to ensure there are no leaks or usage, re-pressurize the auxiliary water system, and restart the test at Step 3.
 - If the water level overflows the clear site tube (or pressure rises in the gauge), inspect the auxiliary water isolation valves to ensure they are closed tight and not leaking, re-pressurize the auxiliary water system, and restart the test at Step 3. Continuous flow/pressure rise after verification that the auxiliary water isolation valves are closed tight and not leaking indicates a cross-connection.
5. If no cross-connection is confirmed, re-pressurize the auxiliary water system. If a cross-connection is discovered, immediately activate the procedures described in Section 16 of this Manual, Emergency Cross-Connection Response Plan.
 6. Fill clear site tubes on the potable water system (hot and cold water) test connections and close the test connection valves. If the pressures are too high for site tubes, use pressure gauges, preferably with digital readouts.
 7. Shut off and isolate the potable water system. Note that the hot and cold systems must be tested separately. Open the potable water vent valve to relieve pressure and note the static water level in the clear site tube (or gauge) by opening the test connection valve.
 - If the water level remains the same, note the potable water system as tight/no cross-connection
 - If the water level recedes in the clear site tube (or pressure falls in the gauge), inspect the potable water system to ensure there are no leaks or usage, re-pressurize the potable water system, and restart the test at Step 6.
 - If the water level overflows the clear site tube (or pressure rises in the gauge), inspect the potable water isolation valves to ensure they are closed tight and not leaking, re-pressurize the potable water system, and restart the test at Step 6. Continuous flow/pressure rise after verifying that the potable water isolation valves are closed tight and not leaking indicates a cross-connection.
 8. If no cross-connection is confirmed, re-pressurize the potable water system. If a cross-connection is discovered, immediately activate the procedures described in Section 16 of this Manual, Emergency Cross-Connection Response Plan.
 9. Shut off and drain the auxiliary water system.
 10. Check all fixtures on both the potable and auxiliary water systems for flow/pressure. Flow/pressure from any fixture on the auxiliary water system indicates a cross-connection. No flow/pressure from any fixture on the potable water system indicates a cross-connection.
 11. If no cross-connection is confirmed, re-pressurize the auxiliary water system. If a cross-connection is discovered, immediately activate the procedures described in Section 16 of this Manual, Emergency Cross-Connection Response Plan.

15.2.3 Dynamic Pressure Differential Test

The dynamic pressure differential test consists of the following steps:

1. Ensure water systems are fully operable and pressurized by observing flow/pressure at fixtures on both the potable and auxiliary water systems.
2. Connect separate pressure gauges to the potable and auxiliary water systems. If a differential pressure gauge is available and the test connections are close enough to allow it, one differential pressure gauge may be connected to both systems. Make sure the differential pressure gauge does not allow for a cross-connection.
3. Shut off and isolate the auxiliary water system. Lower the auxiliary water system pressure to approximately 10 pounds per square inch (psi) less than the potable water system pressure; make sure the vent/valve used to lower the pressure is shut off once the pressure is lowered.
 - If the auxiliary water system maintains the differential pressure below the potable water system for at least ten minutes, note the auxiliary water system as tight/no cross-connection.
 - If the pressure on the auxiliary water system continues to decrease, inspect the auxiliary water system to ensure there are no leaks or usage, re-pressurize the auxiliary water system, and restart the test at Step 3.
 - If the pressure on the auxiliary water system does not decrease but maintains a pressure different from that of the potable water system, inspect the auxiliary water isolation valves to ensure they are closed tight and not leaking, re-pressurize the auxiliary water system, and restart the test at Step 3.
 - If the pressure readings of the potable and auxiliary water systems equalize, the inability to maintain a pressure differential indicates a cross-connection.
4. If no cross-connection is confirmed, note the corresponding pressure reading for each water system, note the actual pressure differential between the two systems, and re-pressurize the auxiliary water system. If a cross-connection is discovered, immediately activate the procedures described in Section 16 of this Manual, Emergency Cross-Connection Response Plan.
5. Shut off and isolate the potable water system. Lower the potable water system pressure to approximately 10 psi less than the auxiliary water system pressure.
 - If the potable water system maintains the differential pressure below the auxiliary water system, note the potable water system as tight/no cross-connection.
 - If the pressure on the potable system continues to decrease, inspect the potable water system to ensure there are no leaks or usage, re-pressurize the potable water system, and restart the test at Step 5.
 - If the pressure on the potable water system does not decrease but maintains a pressure different from that of the auxiliary water system, inspect the potable water isolation valves to ensure they are closed tight and not leaking, re-pressurize the potable water system, and restart the test at Step 5.
 - If the pressure readings of the potable and auxiliary water systems equalize, the inability to maintain a pressure differential indicates a cross-connection.

6. If no cross-connection is confirmed, note the corresponding pressure reading for each water system, note the actual pressure differential between the two systems, and re-pressurize the potable water system. If a cross-connection is discovered, immediately activate the procedures described in Section 16 of this Manual, Emergency Cross-Connection Response Plan.
7. Shut off and drain the auxiliary water system.
8. Check all fixtures on both the potable and auxiliary water systems for flow/pressure. Flow/pressure from any fixture on the auxiliary water system indicates a cross-connection. No flow/pressure from any fixture on the potable water system indicates a cross-connection.
9. If no cross-connection is confirmed, re-pressurize the auxiliary water system. If a cross-connection is discovered, immediately activate the procedures described in Section 16 of this Manual, Emergency Cross-Connection Response Plan.

16 Emergency Cross-Connection Response Plan

16.1 Response Procedures

As set forth in Rules and Regulations Section G, Rule 11, all emergency response activities and repairs on the customer side of the water meter for standard-plumbed systems and for operating dual-plumbed systems must be conducted at the sole expense of the property owner. Upon the discovery of a cross-connection that poses a risk to the public water system:

1. The property owner/User Supervisor must immediately notify the SFPUC by calling Millbrae Dispatch at 650-872-5900 and asking to speak with the on-call WQD Inspector. The property owner must inform the WQD Inspector of the nature of the cross-connection, the date and time it was discovered, and the contact information of the person reporting the cross-connection.
2. The property owner/User Supervisor must also submit written notification to WQD within 24 hours of the incident and include an explanation of the nature of the cross-connection, the date and time it was discovered, and the contact information of the person reporting the cross-connection. The notification must include the property owner/User Supervisor's plan for correction action.
3. For dual-plumbed systems, the property owner/User Supervisor must shut down and drain the auxiliary water system.
4. For dual-plumbed systems, the SFPUC must shut down the potable water supply at the point of connection. For standard-plumbed systems, the SFPUC may shut down the potable water supply at the point of connection.
5. The property owner/User Supervisor must immediately locate and disconnect the cross-connection. If necessary, the property owner must obtain a plumbing permit from the appropriate jurisdiction.
6. The property owner/User Supervisor must provide potable drinking water for the property's occupants, if applicable, until the property's internal potable water system is deemed safe to drink.
7. After the cross-connection has been remediated, a property owner with a standard-plumbed system must contact WQD, which may conduct a visual inspection of the property to confirm that the cross-connection has been eliminated. A property owner/User Supervisor with a dual-plumbed system must itself conduct a visual inspection and cross-connection test, in accordance with Sections 14 and 15 of this Manual.
8. The property owner/User Supervisor must disinfect the property's internal potable water plumbing system in accordance with the California Plumbing Code §609.10.
9. Twenty-four hours after disinfection, the property owner/User Supervisor must flush the property's internal potable water system and conduct a standard bacteriological test. The property owner may request that WQD conduct the standard bacteriological test for the fee specified in the SFPUC's *Rate Schedules & Fees for Water and Sewer Service*, Schedule W-43, available on the SFPUC website (<https://www.sfpuc.gov/accounts->

services/water-power-sewer-rates/rates) and subject to change at the beginning of each fiscal year.

10. If the results of the bacteriological test are acceptable, the SFPUC will restore potable water service.
11. The property owner must prepare a written report and include an explanation of the nature of the cross-connection, the date and time it was discovered, the remedial action taken, and the results of the cross-connection test and bacteriological test. The report must be submitted to WQD within two business days of resumption of potable water service.

16.2 Notifications

The SFPUC will follow the SFPUC's *Water Quality Notifications and Communications Plan*, which describes appropriate actions to be taken in case of water quality variations that require communications within the SFPUC and with the SWRCB, wholesale customers, and/or the public.

Specifically, the SFPUC will notify the SWRCB and the SFDPH-EH of any known or suspected incident of backflow that poses a high risk of hazard to the public water system within 24 hours of the determination. If required by the SWRCB, the SFPUC will issue a Tier 1 public notification pursuant to CCR Title 22 §64463.1. If required by the SWRCB, the SFPUC will submit, by a date specified by the SWRCB, a written incident report describing the details and affected area of a backflow incident, the actions taken by the SFPUC in response to the incident, and follow-up actions to prevent future backflow incidents. The report will include, at a minimum, the information included in the SFPUC's Backflow Incident Reporting Form, which is included in Appendix F.

17 Recordkeeping

The SFPUC tracks BPAs in a proprietary MIS but expects to transition to a commercial application by early 2026. The SFPUC maintains some information in its Backflow Assembly Tracker (BFAT) application, an electronic system for tracking new BPA installations until the BPAs have been tested, after which they are tracked in the SFPUC's MIS. The SFPUC also maintains information on a files sharing site, SharePoint. Table 17-1 lists the records that CCCPH requires public water systems to maintain, where the information is currently stored, and where it will be stored once SFPUC's new MIS is online in 2026.. These records will be made available to the SWRCB upon request.

Table 17-1. Required Records and Location

Record	2025			2026	
	Current MIS	SharePoint	BFAT	Future MIS	SharePoint
1. Two most recent hazard assessments for each user premises		✓	✓	✓	
2. For each BPA: Hazard/application, location, owner, type, manufacturer and model, size, installation date, and serial number	✓			✓	
3. For each Air Gap: Hazard/application, location, owner, and as-built plans	✓			✓	
4. Results of all BPA field testing, AG inspections, and swivel-ell inspections and field tests for the previous three calendar years, including the name, test date, repair date, and certification number of the backflow prevention assembly tester for each BPA field test and AG and swivel-ell	✓			✓	
5. Repairs made to, or replacement or relocation of, BPAs for the previous three calendar years	✓			✓	

Record	2025			2026	
	Current MIS	SharePoint	BFAT	Future MIS	SharePoint
6. Most current cross-connection tests	✓	✓		✓	
7. Property with User Supervisor: contact information for User Supervisor and water user and applicable training and qualifications		✓		✓	
8. Description and follow-up actions for all backflow incidents		✓		✓	
9. If part of CCC program carried out under contract or agreement, copy of current contract/agreement		✓			✓
10. Current CCC Plan		✓			✓
11. Public outreach/ education materials for previous three calendar years		✓			✓
12. Legally binding agreement for swivel-ells and spool pieces		✓		✓	

18 User Supervisors

As set forth in Rules and Regulations Section G, Rule 12, if required by the SFPUC, property owners must designate a User Supervisor when a property has a multi-piping system that conveys various types of fluids, some of which may be hazardous, and where changes in the piping system are frequently made. In San Francisco, User Supervisors are also required for properties with auxiliary water systems (Treatment System Managers subject to San Francisco Health Code Article 12C), properties with district-scale alternate water source systems (Site Supervisors subject to San Francisco Health Code Article 12C), and properties receiving municipally supplied recycled water (Site Supervisors subject to the SFPUC Rules and Regulations for Users Receiving Recycled Water Service in the City and County of San Francisco).

Property owners must:

- Provide WQD with written notice of the User Supervisor's designation within five business days of the designation. The property owner must promptly communicate any changes in designation to WQD and ensure that the current contact information of the User Supervisor is on file with WQD at all times.
- Ensure that the User Supervisor has, at a minimum, the following qualifications:
 - Understanding of the safe, effective operation of the piping systems and components on the property.
 - Understanding of how to avoid cross-connections between piping systems on the property.
 - Training on the fluids used on the property.
- Ensure that User Supervisors attend an initial training provided by the SFPUC's Water Resources Division (for properties receiving recycled water) or SFPD-PH-EH (for properties subject to Health Code Article 12C). If there are significant changes to the SFPUC's requirements or applicable laws, rules, or regulations, or there are significant changes to the piping systems on the property, the SFPUC may require User Supervisors to attend an updated training.
- Ensure the User Supervisor's compliance with the requirements of this Manual. Property owners who fail to comply with these requirements may be subject to enforcement as described in Section 20.

User Supervisors must:

- Avoid cross-connections during the installation, operation, and maintenance of a property owner's pipelines and equipment.
- Inform WQD of changes in piping by contacting WQD at least 15 calendar days before making the changes.
- If a cross-connection is discovered at the property, follow the emergency response plan described in Section 16 of this Manual, Emergency Cross-Connection Response Plan.

Specific qualifications and training requirements for User Supervisors at properties with auxiliary water systems and those receiving municipally supplied recycled water are set forth in the SFPD-PH-EH Director's Rules and Regulations Regarding the Operation of Alternate Water Source Systems, Section 9 (Treatment System Managers) and Section 10 (Site Supervisors), and

18 User Supervisors

As set forth in Rules and Regulations Section G, Rule 12, if required by the SFPUC, property owners must designate a User Supervisor when a property has a multi-piping system that conveys various types of fluids, some of which may be hazardous, and where changes in the piping system are frequently made. In San Francisco, User Supervisors are also required for properties with auxiliary water systems (Treatment System Managers subject to San Francisco Health Code Article 12C), properties with district-scale alternate water source systems (Site Supervisors subject to San Francisco Health Code Article 12C), and properties receiving municipally supplied recycled water (Site Supervisors subject to the SFPUC Rules and Regulations for Users Receiving Recycled Water Service in the City and County of San Francisco).

Property owners must:

- Provide WQD with written notice of the User Supervisor's designation within five business days of the designation. The property owner must promptly communicate any changes in designation to WQD and ensure that the current contact information of the User Supervisor is on file with WQD at all times.
- Ensure that the User Supervisor has, at a minimum, the following qualifications:
 - Understanding of the safe, effective operation of the piping systems and components on the property.
 - Understanding of how to avoid cross-connections between piping systems on the property.
 - Training on the fluids used on the property.
- Ensure that User Supervisors attend an initial training provided by the SFPUC's Water Resources Division (for properties receiving recycled water) or SFPD-PH-EH (for properties subject to Health Code Article 12C). If there are significant changes to the SFPUC's requirements or applicable laws, rules, or regulations, or there are significant changes to the piping systems on the property, the SFPUC may require User Supervisors to attend an updated training.
- Ensure the User Supervisor's compliance with the requirements of this Manual. Property owners who fail to comply with these requirements may be subject to enforcement as described in Section 20.

User Supervisors must:

- Avoid cross-connections during the installation, operation, and maintenance of a property owner's pipelines and equipment.
- Inform WQD of changes in piping by contacting WQD at least 15 calendar days before making the changes.
- If a cross-connection is discovered at the property, follow the emergency response plan described in Section 16 of this Manual, Emergency Cross-Connection Response Plan.

Specific qualifications and training requirements for User Supervisors at properties with auxiliary water systems and those receiving municipally supplied recycled water are set forth in the SFPD-PH-EH Director's Rules and Regulations Regarding the Operation of Alternate Water Source Systems, Section 9 (Treatment System Managers) and Section 10 (Site Supervisors), and

the SFPUC Rules and Regulations for Users Receiving Recycled Water Service in the City and County of San Francisco, Rule 6 (Site Supervisor and Staff Training). These regulations are included in Appendix C.

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19 Notices and Inspections

As set forth in Rules and Regulations Section G, Rule 13, property owners must eliminate any unprotected cross-connection by the date specified in a notice from the SFPUC. If a property owner refuses or fails to eliminate a cross-connection within the timeframe required in the SFPUC's notice, the SFPUC may proceed with enforcement activities in accordance with Rules and Regulations Section G, Rule 14, and described in Section 20 of this Manual.

Property owners must provide information about water uses within their properties to the SFPUC as directed in any notice from the SFPUC requesting such information, as necessary to comply with State of California regulatory requirements for hazard assessments. Any property owner that does not comply with the SFPUC's request for information within the timeframe specified in the notice will be subject to enforcement activities as described in Section 20 of this Manual. Enforcement actions may include, but are not limited to, requiring the property owner to install an RP, at the property owner's expense, at the point of connection to the public water system.

As a condition of receiving water service, a property owner must permit the SFPUC to inspect any property subject to Rules and Regulations Section G and the requirements of San Francisco Health Code Article 12A to determine compliance with SFPUC's cross-connection control requirements and any other applicable laws and regulations. The SFPUC may exercise this right of entry during normal business hours in the absence of advance notice. In case of a suspected or confirmed backflow event on a property occurring outside of normal business hours, a property owner must provide the SFPUC immediate access to the property. If the SFPUC cannot gain immediate access, the SFPUC may shut off the water service at the point of connection.

Whenever the SFPUC determines that an existing or potential unprotected cross-connection at a property poses a high risk of hazard to the public water system and requires immediate abatement, the SFPUC may immediately terminate water service to the subject property without notice until the cross-connection has been eliminated and charge the property owner applicable fees.

20 Enforcement, Citations, and Fines (Property Owners)

20.1 Enforcement

The SFPUC is only responsible for enforcement of cross-connection control requirements for containment, including isolation in lieu of containment, not for abatement of cross-connections within a water user's premises (isolation). As set forth in Rules and Regulations Section G, Rule 14(a-c), if a property owner does not comply with cross-connection control requirements included in this Manual, Rules and Regulations Section G, or Article 12A of the San Francisco Health Code, the SFPUC may take any of the following measures:

- Issue a written notice establishing a deadline for compliance. The recipient may seek to meet and confer with the SFPUC to establish a plan for compliance.
- Issue citations.
- Impose administrative fines and penalties.
- Modify or terminate water service.
- Any other action deemed necessary by the SFPUC to protect the public water system.

If the SFPUC determines that an existing or potential unprotected cross-connection poses an imminent risk of hazard to the public water system and requires immediate abatement, the SFPUC may without notice immediately shut off water service to the property at the meter until the cross-connection has been eliminated. Otherwise, with written notice to the property owner, as well as the customer if the property owner is not the customer, the SFPUC may modify or terminate water service by:

- Shutting off the noncompliant water service(s) until the cross-connection has been eliminated, with appropriate fees applied to the customer's water bill.
- Installing a flow restrictor on all non-fire service lines to the property to minimize the backflow hazards until they have been corrected, with appropriate fees applied to the customer's water bill.
- Testing the BPA installed at the property or otherwise correcting the cross-connection, with the cost of the test or correction applied to the customer's water bill.
- Any other action related to the modification or termination of water service deemed necessary by the SFPUC to protect the public water system.

A more detailed description of the SFPUC's enforcement process is provided in Appendix L.

20.2 Citations and Fines

As set forth in Rules and Regulations Section G, Rule 14(d), the SFPUC may issue a citation in a manner consistent with Chapter 100 of the San Francisco Administrative Code, "Procedures Governing the Imposition of Administrative Fines," as that chapter may be amended from time to time, and the enforcement provisions of San Francisco Health and Safety Code Article 12A. The citation will specify the amount of the fine imposed for each violation, which may be up to \$1,000 per violation per day. Each day that a violation continues or there is non-compliance constitutes a separate violation that may be subject to a separate fine. All violations and respective fines may be cumulative of each other (one citation may contain multiple fines) and

will be imposed in addition to any other civil or criminal federal, state, or local fine or penalty under the law or of any other remedy available to the SFPUC under the law. Administrative fines must be paid to the Treasurer of the City and County of San Francisco.

The SFPUC may recover any costs and fees, including but not limited to attorney fees, for enforcement initiated through and authorized under San Francisco Health Code Article 12A and Rules and Regulations Section G. Fees related to enforcement actions will be applied to the customer's water bill.

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21 Administrative Review and Appeal

21.1 Property Owners and Customers

As set forth in Rules and Regulations Section G, Rule 15, any person who has been served with a citation may seek administrative review of the citation by filing an appeal with the SFPUC in accordance with the appeal procedures outlined in Chapter 100 of the San Francisco Administrative Code. Consistent with San Francisco Health Code Article 12A, the Director of WQD will appoint a hearing officer to conduct the hearing for the appeal. The hearing officer will determine the time and place of the hearing and provide appropriate notice. The hearing officer must have no personal knowledge of the incident resulting in the citation being challenged, and the hearing officer's regular job duties must be outside the direct chain of command of the citing official.

The hearing officer may request additional information from the appellant; the appellant's failure to provide the information within the time specified by the hearing officer will result in a decision based on the information available. The hearing officer may, at the hearing officer's sole discretion, invite both the appellant and a representative of the SFPUC Water Enterprise or other CCSF department with knowledge of the citation to the hearing to state their respective positions and answer questions posed by the hearing officer. Any such hearing may be in person, virtual, or submitted in writing as directed by the hearing officer. The hearing officer will issue an administrative decision upholding, modifying, or vacating the citation. The hearing officer's decision will be final on the date issued. The hearing officer will issue a decision within 60 calendar days of the date of the receipt of the written appeal.

21.2 Authorized Backflow Prevention Assembly Testers and Authorized Cross-Connection Control Specialists

Any permittee who has been served with a notice of suspension or revocation of a permit to operate may seek administrative review of the suspension or revocation by submitting a request for review to the Director of WQD, with a written explanation and supporting documentation, as instructed on the notice. A request for review must be received within 30 days of issuance of the notice. Failure to submit a timely request for review will be deemed acceptance of the suspension or revocation. The Director of WQD will appoint a hearing officer, and the hearing officer will conduct a hearing on the suspension or revocation, as described above. The hearing officer will issue an administrative decision upholding, modifying, or vacating the suspension or revocation. The hearing officer's decision will be final on the date issued. The hearing officer will issue a decision within 60 calendar days of the date of the receipt of the request for review, which may be appealed to the San Francisco Board of Appeals in the manner prescribed in San Francisco Business and Tax Regulations Code Article 1.

22 Variances

As set forth in Rules and Regulations Section G, Rule 16, any request for a variance from the requirements of this Manual or Rules and Regulations Section G must be made in writing and submitted to the Director of WQD. The Director may, at the Director's sole discretion, grant variances from specific requirements on a limited basis provided that the variances do not pose a threat to the public water system and are consistent with applicable state and local laws and regulations. All variances are subject to additional mitigation that the property owner will be required to implement and maintain.

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23 References Cited

1. San Francisco Health Code, Article 12A, Backflow Prevention.
2. SFPUC, 2024. Rules and Regulations Governing Water Service to Customers, Section G, Cross-Connection Control.
3. University of Southern California Foundation for Cross-Connection Control and Hydraulic Research, 2009. *Manual of Cross-Connection Control*, Tenth Edition.
4. California Health and Safety Code §17922.12(a) (definition of graywater).
5. United States Environmental Protection Agency, 2003. *Cross-Connection Control Manual*.
6. Water Resources Engineering, Inc., 2021. Draft Technical Memorandum: *Prioritization of Cross-Connection Control Surveys of City's Commercial and Multifamily Water Service Connections*.

APPENDIX A

Crosswalk of CCCPH Requirements and Manual

Crosswalk of CCCPH Requirements and Manual

CCCPH Requirement	Response/Location in Manual
Chapter 3 Standards for Backflow Protection and Cross-Connection Control	
Article 1: Definitions and General Requirements	
3.1.1 Definitions	Definitions follow the table-of-contents.
3.1.2 Applicability A public water system (PWS) must comply with the requirements of the CCCPH.	The SFPUC will comply with the requirements of the CCCPH, as detailed in the Manual.
3.1.3 Program for Public Water System Cross-Connection Control a) A PWS must protect the public water supply through implementation and enforcement of a cross-connection control program. Unless otherwise specified by this Chapter or directed by the State Water Board, a PWS may implement its cross connection control program, in whole or in part, either directly or by way of contract or agreement with another party. The PWS, however, shall not be responsible for abatement of cross-connections which may exist within a user's premises. The cross connection control program must include at a minimum the following elements:	The SFPUC protects the public water supply through enforcement of its cross-connection control program. The SFPUC implements its program directly with some support from other San Francisco departments. The SFPUC has an interdepartmental work order with SFDPH-EH, as described in Section 1.8, Responsibilities of the Entities Involved in the CCSF's Cross-Connection Control Program, and included in Appendix D, SFPUC/SFDPH-EH Interdepartmental Work Order and Workplan. The SFPUC will not be responsible for the abatement of cross-connections within a user's premises (i.e., isolation), except when isolation in lieu of containment has been accepted. The SFPUC's cross-connection control program includes the following elements.
(1) Operating rules or ordinances – Each PWS must have operating rules, ordinances, by-laws or a resolution to implement the cross-connection program. The PWS must have legal authority to implement corrective actions in the event a water user fails to comply in a timely manner with the PWS's provisions regarding the installation, inspection, field testing, or maintenance of BPAs required pursuant to this Chapter. Such corrective actions must include the PWS's ability to perform at least one of the following: (A) deny or discontinue water service to a water user, (B) install,	The SFPUC's operating rules and ordinances are described in Section 1.4 and included in Appendix C, Regulations Applicable to Cross-Connection Control.

Cross-Walk of CCCPH Requirements and Manual

CCCPH Requirement	Response/Location in Manual
Chapter 3 Standards for Backflow Protection and Cross-Connection Control	
inspect, field test, and/or maintain a BPA at a water user's premises, or (C) otherwise address in a timely manner a failure to comply with the cross-connection control program.	
(2) Cross-Connection Control Program Coordinator – The PWS must designate at least one individual involved in the development of and be responsible for the reporting, tracking, and other administration duties of its cross-connection control program. For PWS with more than 3,000 service connections the Cross-Connection Control Program Coordinator must be a cross-connection control specialist.	The SFPUC has designated one manager (Chief Water Service Inspector) and one supervisor (Senior Water Service Inspector) as the primary and secondary cross-connection control program coordinators. Both are certified cross-connection control specialists and testers, and both are involved in administrative duties of the cross-connection program. See Appendix B, Cross-Connection Control Certified Staff, for a list of cross-connection control staff, certifications, and contact information.
(3) Hazard Assessments – The PWS must survey its service area and conduct hazard assessments per Article 2 of this Chapter that identifies actual or potential cross-connection hazards, degree of hazard, and any backflow protection needed.	Hazard assessments are addressed in Section 7, Hazard Assessments.
(4) Backflow Prevention – The PWS must ensure that actual and potential cross-connections are eliminated when possible or controlled by the installation of approved BPAs or AG's consistent with the requirements of the Article 3 of this Chapter.	This Manual describes the SFPUC's backflow prevention procedures, which are consistent with the requirements of Article 3 of the CCCPH.
5) Certified Backflow Prevention Assembly Testers and Certified Cross Connection Control Specialists – The PWS must ensure all BPA testers and cross-connection control specialists used are certified per Article 4 of this Chapter.	See Sections 11 (Permits to Operate as an Authorized Backflow Prevention Tester or Cross-connection Control Specialist) and 12 (Companies Employing Authorized Backflow Prevention Assembly Testers and Authorized Cross-Connection Control Specialists).
(6) Backflow Prevention Assembly Testing – The PWS must develop and implement a procedure for ensuring all BPAs are field tested, inspected, and maintained and AG's are inspected and maintained in accordance with CCCPH section 3.3.3.	See Section 5, Testing, Inspection, and Repair Requirements for Backflow Prevention Assemblies and Air Gaps.
(7) Recordkeeping – The PWS must develop and implement a recordkeeping system in accordance with CCCPH section 3.5.1.	See Section 17, Recordkeeping

Cross-Walk of CCCPH Requirements and Manual

CCCPH Requirement	Response/Location in Manual
Chapter 3 Standards for Backflow Protection and Cross-Connection Control	
(8) Backflow Incident Response, Reporting and Notification – The PWS must develop and implement procedures for investigating and responding to suspected or actual backflow incidents in accordance with Article 5 of this chapter.	See Section 2.5, Responding to Complaints and Reports of Cross-Connections, and Section 16, Emergency Cross-Connection Response Plan.
(9) Public Outreach and Education – The PWS must implement a cross connection control public outreach and education program element that includes educating staff, customers, and the community about backflow protection and cross-connection control. The PWS may implement this requirement through a variety of methods which may include providing information on cross-connection control and backflow protection in periodic water bill inserts, pamphlet distribution, new customer documentation, email, and consumer confidence reports.	See Section 13, Public Outreach Program.
(10) Local Entity Coordination – The PWS must coordinate with applicable local entities that are involved in either cross-connection control or public health protection to ensure hazard assessments can be performed, appropriate backflow protection is provided, and provide assistance in the investigation of backflow incidents. Local entities may include but are not limited to plumbing, permitting, or health officials, law enforcement, fire departments, maintenance, and public and private entities.	See Sections 1.2 (Cross-Connection Control Program Administration) and 1.8 (Responsibilities of the Entities Involved in the CCSF’s Cross-Connection Control Program).
(b) The cross-connection control program must be developed in consultation with a cross-connection control specialist if: (1) The PWS has 1,000 or more service connections, or (2) required by the State Water Board.	The cross-connection control program was developed in consultation with staff who are cross-connection control specialists.

Cross-Walk of CCCPH Requirements and Manual

CCCPH Requirement	Response/Location in Manual
Chapter 3 Standards for Backflow Protection and Cross-Connection Control	
(c) A PWS must have at least one cross-connection control specialist as a permanent or contracted employee of the PWS, and that specialist, or their designee, must be able to be contacted within one hour, if: (1) The PWS has 3,000 or more service connections, or (2) the PWS has less than 3,000 service connections and is directed by the State Water Board based on hazard assessments conducted pursuant to CCCPH section 3.2.1. or the PWS's history of backflow incidents.	The SFPUC has eight full-time Water Service Inspectors who are all cross-connection control specialists. An Inspector is available 24/7 and can respond to emergencies in under an hour.
3.1.4 Plan for Public Water System Cross-Connection Control (a) After adoption of the CCCPH, each PWS must submit a written Cross-Connection Control Plan for State Water Board review in accordance with the following schedule: (1) An Existing PWS must submit the Cross-Connection Control Plan no later than 12 months after the effective date of the CCCPH. (2) A new PWS must submit the Cross-Connection Control Plan for review and approval prior to issuance of a domestic water supply permit. (3) A PWS may submit a written request to the State Water Board for an extension of the deadline for submittal of its initial Cross-Connection Control Plan. The PWS's application must include a written description of the need for an extension. Approval of an extension will be at the sole discretion of the State Water Board.	The initial Preliminary Draft Manual was submitted to the SWRCB on July 1, 2025. The SFPUC requests that any comments by SWRCB be given to the SFPUC by September 15, 2025, so that a final, SWRCB-approved Manual can be in place by October 1, 2025, as discussed with SWRCB staff. If SWRCB has no additional comments, the October 1 version of this Manual will be the final version.
(b) The Cross-Connection Control Plan for a community water system must include, at a minimum, the following cross-connection control program procedures and documentation:	See the responses below.
(1) a description of how the community water system will achieve and maintain compliance with each requirement in this Chapter;	See the responses below.
(2) a description of the process, personnel, and timeframes for completing initial and ongoing hazard assessments pursuant to CCCPH section 3.2.1;	See Section 7, Hazard Assessments.

Cross-Walk of CCCPH Requirements and Manual

CCCPH Requirement	Response/Location in Manual
Chapter 3 Standards for Backflow Protection and Cross-Connection Control	
(3) a description of the legal authority pursuant to CCCPH section 3.1.3 to implement corrective actions in the event a water user fails to comply in a timely manner with the provisions of the PWS's cross connection control program;	The SFPUC's operating rules and ordinances are described in Section 1.4 and included in Appendix C, Regulations Applicable to Cross-Connection Control.
(4) a description of the process and timeframes for ensuring each BPA is inspected and field tested, and AG is inspected, at a frequency no less than required by this Chapter;	See Section 5, Testing, Inspection, and Repair Requirements for Backflow Prevention Assemblies and Air Gaps.
(5) a description of the process and timeframe for ensuring each non-testable backflow preventer that is under the PWS ownership or administration is installed and maintained according to the California Plumbing Code;	See Section 1.8, Responsibilities of the Entities Involved in the CCSF's Cross-Connection Control Program, subheading "Department of Building Inspection, Plumbing Inspection Division."
(6) a description of the process for ensuring individuals field testing and inspecting BPAs are no less qualified than required by this Chapter, including but not limited to confirmation of the individual's: (A) certification as a backflow prevention assembly tester, (B) field test kit or gage equipment accuracy verification, and (C) BPA field test result reports;	See Sections 11 (Permits to Operate as an Authorized Backflow Prevention Tester or Cross-connection Control Specialist) and 12 (Companies Employing Authorized Backflow Prevention Assembly Testers and Authorized Cross-Connection Control Specialists).
(7) a description of the procedures and timeframes of activities for responding to backflow incidents, including notification of customers, and reporting of backflow incidents pursuant to CCCPH section 3.5.2;	See Section 16, Emergency Cross-Connection Response Plan.
(8) contact information for cross-connection control personnel including any cross-connection control program coordinator and specialist;	See Appendix B, Cross-Connection Control Program Certified Staff.
(9) a description of the tracking system that maintains current and relevant information, including: (A) recordkeeping information required pursuant to CCCPH section 3.5.1, (B) location and type of each BPA, and (C) highest threat potential hazard from which a given BPA is protecting the public water system distribution system;	See Section 17, Recordkeeping.

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CCCPH Requirement	Response/Location in Manual
Chapter 3 Standards for Backflow Protection and Cross-Connection Control	
10) for user supervisors, if used, the required information pursuant to CCCPH section 3.2.2 (f);	See Section 18, User Supervisors.
(11) the corrective actions, including timeframes for the corrective actions, that a community water system will implement when: (A) a cross-connection exists and the BPA installed is not commensurate with the user premises' hazard or no BPA has been installed, or (B) a BPA needs to be replaced or maintained;	See Section 20, Enforcement, Citations, and Fines (Property Owners).
(12) a description of the public outreach and education program to comply with CCCPH section 3.1.3(a)(9); and (13) the procedures for coordination with local entities.	See Section 13, Public Outreach Program.
(c) The Cross-Connection Control Plan for a noncommunity water system must include, at a minimum, the following cross-connection control program procedures and documentation: (1) a description of how the noncommunity water system will achieve and maintain compliance with each requirement in this Chapter that is applicable to the noncommunity water system; (2) a description of the process, personnel, and timeframes for completing initial and ongoing hazard assessments pursuant to CCCPH section 3.2.1; (3) a description of the legal authority pursuant to CCCPH section 3.1.3 to implement corrective actions in the event a water user fails to comply in a timely manner with the provisions of the PWS's cross-connection control program; (4) a description of the process and timeframes for ensuring each BPA is inspected and field tested and AG is inspected, at a frequency no less than required by this Chapter;	The SFPUC will follow the same procedures for its two noncommunity water systems as those described in this Manual for its community water systems. Note that the SFPUC's two noncommunity water systems are owned and operated by the SFPUC; they are occupied by a small number of SFPUC staff.
(5) a description of the process and timeframe for ensuring each non-testable backflow preventer for internal protection that is under the PWS ownership or administration is installed and maintained according to the California Plumbing Code;	The SFPUC will follow the same procedures for its two noncommunity water systems as those described in this Manual for its community water systems.

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(6) a description of the process for ensuring individuals field testing and inspecting BPAs are no less qualified than required by this Chapter, including but not limited to confirmation of the individual's: (A) certification as a backflow prevention assembly tester, (B) field test kit or gage equipment accuracy verification, and (C) BPA field test result reports; (7) a description of the procedures and timeframes of activities for responding to backflow incidents, including notification of customers, and reporting of backflow incidents pursuant to CCCPH section 3.5.2; (8) contact information for cross-connection control personnel including the cross-connection control program coordinator; (9) maintaining a tracking system with current and relevant information, including: (A) recordkeeping information required pursuant to CCCPH section 3.5.1, (B) location and type of each BPA, (C) location and type of each non-testable backflow preventer used for internal protection in accordance with the California Plumbing Code, if applicable, and (D) potential hazard from which a BPA is protecting the public water system distribution system; (10) for user supervisors, if used, the required information pursuant to CCCPH section 3.2.2(f); (11) the corrective actions, including timeframes for the corrective actions, that a noncommunity water system will implement when: (A) a cross-connection exists and the BPA installed is not commensurate with the user premises' hazard or no BPA has been installed, or (B) a BPA or non-testable backflow preventer needs to be replaced or maintained;	The SFPUC will follow the same procedures for its two noncommunity water systems as those described in this Manual for its community water systems.
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Cross-Walk of CCCPH Requirements and Manual

CCCPH Requirement	Response/Location in Manual
Chapter 3 Standards for Backflow Protection and Cross-Connection Control	
(12) a description of the public outreach and education program to comply with CCCPH section 3.1.3(a)(9); and, (13) the procedures for coordination with local entities (e.g., local health departments with internal cross-connection control programs, building officials, plumbing officials, etc.).	The SFPUC will follow the same procedures for its two noncommunity water systems as those described in this Manual for its community water systems.
(d) A PWS must ensure its Cross-Connection Control Plan is, at all times, representative of the current operation of its Cross-Connection Control program. The PWS must make its Cross-Connection Control Plan available to the State Water Board for review upon request. If a PWS makes a substantive revision to its Cross Connection Control Plan, the PWS must submit the revised Cross-Connection Control Plan to the State Water Board for review.	The SFPUC will revise the Manual as necessary to keep it current. The Manual will be posted on the SFPUC's Cross-Connection Control Program's website (sfpuc.org/backflow). If substantive revisions are made, the SFPUC will submit the revised plan to the SWRCB for review.
Article 2: Hazard Assessments and Required Protection	
3.2.1 Hazard Assessments (a) To evaluate the potential for backflow into the PWS, each community water system must conduct an initial hazard assessment of the user premises within its service area and each noncommunity water system must conduct an initial hazard assessment of its water distribution system. The hazard assessment must consider:	The SFPUC will complete initial hazard assessments of all user premises by June 30, 2049. Previously conducted hazard assessments will be used for the initial hazard assessments. See Section 7, Hazard Assessments.

Cross-Walk of CCCPH Requirements and Manual

CCCPH Requirement	Response/Location in Manual
Chapter 3 Standards for Backflow Protection and Cross-Connection Control	
(1) The existence of cross-connections; (2) the type and use of materials handled and present, or likely to be, on the user premises; (3) the degree of piping system complexity and accessibility; (4) access to auxiliary water supplies, pumping systems, or pressure systems; (5) distribution system conditions that increase the likelihood of a backflow event (e.g., hydraulic gradient differences impacted by main breaks and high water demand situations, multiple service connections that may result in flow-through conditions, etc.); (6) user premises accessibility; (7) any previous backflow incidents on the user premises; and (8) the requirements and information provided in the CCCPH.	See Section 7, Hazard Assessments.
(b) Each hazard assessment must identify the degree of hazard to the PWS's distribution system as either a high hazard cross connection, a low hazard cross connection, or having no hazard. Examples of some high hazard cross-connection activities may be found in Appendix D.	Hazard assessments will identify the degree of hazard at each service connection. See Section 7, Hazard Assessments. Table 3-1, Hazard Criteria and Required Backflow Protection for Containment, lists required protection, including RPs or Air Gaps for the high-hazard conditions/activities listed in CCCPH Appendix D.
(c) The hazard assessment must determine whether an existing BPA, if any, provides adequate protection based on the degree of hazard.	See Section 7, Hazard Assessments. If an existing BPA does not provide adequate protection, the SFPUC will require that backflow protection be upgraded.
(d) Hazard assessments completed prior to the adoption of the CCCPH may be considered as an initial hazard assessment provided that such hazard assessments and associated backflow protection provide protection consistent with the CCCPH and the PWS describes their review of these assessments in the Cross Connection Control Plan required in CCCPH section 3.1.4.	Hazard assessments completed before the adoption of the CCCPH will be considered initial hazard assessments for the purposes of compliance with the CCCPH, as long as there is documentation for them. SFPUC has MIS records of hazard assessments dating back to 2019 and scanned paper records dating to at least 2008.

Cross-Walk of CCCPH Requirements and Manual

CCCPH Requirement	Response/Location in Manual
Chapter 3 Standards for Backflow Protection and Cross-Connection Control	
(e) Subsequent to the initial hazard assessment described in subsection (a), a community water system must perform a hazard assessment under the following criteria: (1) if a user premises changes account holder, excluding single family residences; (2) if a user premises is newly or re-connected to the PWS; (3) if evidence exists of changes in the activities or materials on a user's premises; (4) if backflow from a user's premises occurs; (5) periodically, as identified in the PWS's Cross-Connection Control Plan required pursuant to CCCPH section 3.1.4.; (6) if the State Water Board requests a hazard assessment of a user's premises; and (7) if the PWS concludes an existing hazard assessment may no longer accurately represent the degree of hazard.	See Section 7, Hazard Assessments, Section 7.2.3, Prioritization of Assessments.
(f) Noncommunity water systems must conduct an initial or follow-up hazard assessment within two years of the adoption of the CCCPH.	The SFPUC will conduct an initial or follow-up hazard assessment of its noncommunity water systems within two years of the adoption of the CCCPH.
(g) Noncommunity water system must conduct a follow-up hazard assessment of its water distribution system if any changes are made that could result in a cross connection or any backflow incidents occur.	The SFPUC will conduct a follow-up hazard assessment of its noncommunity water distribution systems if any changes are made that could result in a cross-connection or backflow incidents occur.
h) A cross-connection control specialist must review or conduct each initial and follow-up hazard assessment pursuant to this section and make a written finding that, in the specialist's judgment based on cross-connection control principles, the PWS's hazard assessment properly identified all hazards at the time of the assessment, the appropriate degree of hazards, and the corresponding backflow protection.	See Section 7, Hazard Assessments, Section 7.2.7, Written Findings.

Cross-Walk of CCCPH Requirements and Manual

CCCPH Requirement	Response/Location in Manual
Chapter 3 Standards for Backflow Protection and Cross-Connection Control	
3.2.2 Backflow Protection Required (a) A PWS must ensure its distribution system is protected from backflow from identified hazards through the proper installation, continued operation, and field testing of an approved BPA (see Article 3 for installation and approved BPA criteria). When a DC is required or referenced in the CCCPH, a DCDA or DCDA-II type of assembly may be substituted if appropriate. When an RP is required or referenced in the CCCPH, an RPDA or RPDA-II type of assembly may be substituted if appropriate.	See Section 3, Type and Level of Backflow Prevention Required, Section 4, Installation, Replacement, and Relocation Requirements for Backflow Prevention Assemblies and Air Gaps, and Section 5, Testing, Inspection, and Repair Requirements for Backflow Prevention Assemblies and Air Gaps.
(b) The BPA installed must be no less protective than that which is commensurate with the degree of hazard at a user premises, as specified in this Chapter and as determined based on the results of the hazard assessment conducted pursuant to CCCPH section 3.2.1.	See Section 7, Hazard Assessments, Section 7.2.1, Purpose of Assessments.
(c) Unless specified otherwise in this Chapter, a PWS must, at all times, protect its distribution system from high hazard cross-connections (see Appendix D for examples), through premises containment, through the use of AG(s) or RP(s). (1) Following State Water Board review and approval, a PWS may implement an alternate method of premises containment in lieu of a required AG provided that the proposed alternative would not increase the level of risk to protection of public health. (2) Following State Water Board review and approval, a PWS may accept internal protection in lieu of containment when premises containment is not feasible.	The SFPUC will protect its distribution system from high hazard cross-connections through premises containment using AGs, RPs, or alternative methods approved by SWRCB (i.e., firefighting hydrant protection). SFPUC will accept existing internal protection in lieu of containment when it provides adequate protection for the hazard. SFPUC will accept future internal protection in lieu of containment when it provides adequate protection for the hazard, and premises containment is not feasible due to site conditions. SFPUC may require additional mitigation.
(d) Except as otherwise allowed or prohibited in statute or in CCR Title 22, Division 4, Chapter 3, a swivel-ell may be used instead of an AG for premises containment protection when temporarily substituting tertiary recycled water use areas with potable water from a PWS if all the following criteria are met:	See Section 14.4, Swivel-Ell Connections. Note that some SFPUC sites have an alternative method of protection via a movable spool piece. SFPUC procedures specify the conditions under which spool pieces may be installed. SFPUC inspects these facilities annually.

Cross-Walk of CCCPH Requirements and Manual

CCCPH Requirement	Response/Location in Manual
Chapter 3 Standards for Backflow Protection and Cross-Connection Control	
(1) the swivel-ell is approved by the State Water Board; (2) the PWS has a cross-connection control program, required pursuant to CCCPH section 3.1.3, and the use and operation of the swivel-ell is described in the Cross-Connection Control Plan required pursuant to CCCPH section 3.1.4; (3) the design and construction-related requirements of the swivel-ell adheres to the criteria in Appendix C; (4) at least every 12 months, inspections are performed and documented to confirm ongoing compliance with the design and construction-related requirements in Appendix C; (5) the RP used in conjunction with the swivel-ell is field tested and found to be functioning properly: (A) immediately upon each switchover to potable water use, a visual inspection of the RP must be completed (B) within 72 hours of each switchover to potable water use, a field test must be completed, and (C) at least every 12 weeks the use site is supplied with potable water; and	See Section 14.4, Swivel-Ell Connections.
(6) there is a legally binding agreement between the PWS and the entity supplying the recycled water, signed by those with relevant legal authority, that includes the following requirements: (A) The State Water Board will be notified within 24 hours of all switchovers to or from potable water, will be given an estimate of the timeframe until the next switchover, and will be provided the results of the field testing required in paragraph (5); (B) a trained representative of the PWS be present to supervise each switchover; and (C) within seven days of each switchover, if requested by the State Water Board, the PWS will submit a written report describing compliance with this subsection, as well as potable and recycled water usage information.	See Section 14.4, Swivel-Ell Connections.
(e) Except as noted below, a PWS must ensure its distribution system is protected with no less than DC protection for a user premises with a fire protection system within ten years of adoption of the CCCPH.	See Section 8, Upgrading Protection on Dedicated Fire Services. The SFPUC will ensure that all fire services are protected with no less than DC protection by June 30, 2039. A five-year extension is needed due to the large number of fire services that need to be upgraded (4,237), cost, and the complexity of the work.
(1) A high hazard cross-connection fire protection system, including but not limited to fire protection systems that may utilize chemical addition (e.g., wetting agents, foam, anti-freeze, corrosion inhibitor, etc.) or an auxiliary water supply, must have no less than RP protection.	This requirement is included in Section 8, Upgrading Protection on Dedicated Fire Services.

Cross-Walk of CCCPH Requirements and Manual

CCCPH Requirement	Response/Location in Manual
Chapter 3 Standards for Backflow Protection and Cross-Connection Control	
(2) For existing fire protection systems that do not meet Section 3.2.2 (e)(3) or cannot install DC protection within ten years of adoption of the CCCPH, a PWS may propose in the cross-connection control plan submitted for CCCPH Section 3.1.4: (A) an alternative date; or (B) an alternative method of backflow protection that provides at least the same level of protection to public health.	The SFPUC will ensure that all fire services are protected with no less than DC protection by June 30, 2039. In unusual circumstances, the SFPUC may allow an alternative method of backflow protection that provides at least the same level of protection to public health.
(3) A BPA is not necessary for a low hazard fire protection system on a residential user premises if the following criteria are satisfied: (A) the user premises has only one service connection to the PWS; (B) a single service line onto the user premises exists that subsequently splits on the property for domestic flow and fire protection system flow, such that the fire protection system may be isolated from the rest of the user premises; (C) a single, water industry standard, water meter is provided to measure combined domestic flow and fire protection system flow; (D) the fire protection system is constructed of piping materials certified as meeting NSF/ANSI Standard 61; and (E) the fire protection system's piping is looped within the structure and is connected to one or more routinely used fixtures (such as a water closet) to prevent stagnant water.	(3) The SFPUC does not require a BPA for combination domestic and fire protection services if the only hazard is a low-hazard fire potable service and criteria A-E are met. The SFPUC may grandparent acceptance of these services if some criteria were not met but were up to code at the time of installation.
(f) The State Water Board and PWS may, at their discretion, require a water user to designate a user supervisor when the user premises has a multi-piping system that conveys various types of fluids and where changes in the piping system are frequently made. If a user supervisor is designated the following is required: (1) The user supervisor is responsible for the avoidance of cross-connections during the installation, operation and maintenance of the water user's pipelines and equipment. The user supervisor must be trained on the fluids used and backflow protection for the premise, and must inform the PWS of changes in piping, and maintain current contact information on file with the PWS; and (2) The PWS must include in the Cross-Connection Control Plan required in CCCPH section 3.1.4 the training and qualification requirements for user supervisors, identify the entity that will provide the user supervisor training, and frequency of any necessary recurring training. The training must adequately address the types of hazards and concerns typically found.	See Section 18, User Supervisors.

Cross-Walk of CCCPH Requirements and Manual

CCCPH Requirement	Response/Location in Manual
Chapter 3 Standards for Backflow Protection and Cross-Connection Control	
(g) Facilities producing, treating, storing, or distributing drinking water that are an approved water supply or water recycling plants as defined by CCR Title 22, Section 60301.710 must have proper internal protection from cross-connections to ensure that all drinking water produced and delivered to customers and workers at those facilities is free from unprotected cross-connections.	SFPUC will conduct hazard assessments of its facilities producing, treating, storing, or distributing drinking water that are an approved water supply and of water recycling plants to ensure they have proper internal protection from cross-connections. SFPUC will ensure that necessary backflow protection is installed and that annual testing and maintenance is conducted.
Article 3: Backflow Prevention Assemblies	
3.3.1 Standards for Types of Backflow Protection (a) The PWS must ensure that each AG used for its Cross-Connection Control Program meets the requirements in Table 1, Minimum Air Gaps for Generally used Plumbing Fixtures, page 4 of the American Society of Mechanical Engineers (ASME) A112.1.2- 2012(R2017) (See Appendix B).	See Section 4, Installation, Replacement, and Relocation Requirements for Backflow Prevention Assemblies and Air Gaps, and Appendix E.9, Air Gap. The SFPUC annually inspects each AG (or spool piece).
(b) The PWS must ensure that each replaced or newly installed PVB, SVB, DC, and RP for protection of the PWS is approved through both laboratory and field evaluation tests performed in accordance with at least one of the following: (1) Standards found in Chapter 10 of the Manual of Cross-Connection Control, Tenth Edition, published by the University of Southern California Foundation for Cross- Connection Control and Hydraulic Research; or (2) certification requirements for BPAs in the Standards of ASSE International current as of 2022 that include ASSE 1015-2021 for the DC, ASSE 1048-2021 for the DCDA & DCDA-II, ASSE 1013-2021 for the RP, and ASSE 1047-2021 for the RPDA & RPDA-II and must have the 1YT mark.	The SFPUC requires that all BPAs be approved by the University of Southern California Foundation for Cross Connection Control and Hydraulic Research.
(c) BPAs must not be modified following approval granted under section 3.3.1 (b). PWS must require BPA testers to notify the PWS if a water user or PWS-owned BPA has been modified from the CCCPH section 3.3.1 (b) approval.	Testers are required to notify the SFPUC if a BPA or Air Gap has been modified (Section 1.8, Responsibilities of the Entities Involved in the CCSF's Cross-Connection Control Program).

Cross-Walk of CCCPH Requirements and Manual

CCCPH Requirement	Response/Location in Manual
Chapter 3 Standards for Backflow Protection and Cross-Connection Control	
3.3.2 Installation Criteria for Backflow Protection (a) For AGs, the following is required: (1) The receiving water container must be located on the water user's premises at the water user's service connection unless an alternate location has been approved by the PWS; (2) all piping between the water user's service connection and the discharge location of the receiving water container must be above finished grade and be accessible for visual inspection unless an alternative piping configuration is approved by the PWS; (3) the PWS must ensure that the AG specified in CCCPH section 3.3.1 (a) has been installed; and (4) any new air gap installation at a user's service connection must be reviewed and approved by the State Water Board prior to installation.	See Section 4, Installation, Replacement, and Relocation Requirements for Backflow Prevention Assemblies and Air Gaps. For installations existing before the submittal of this Manual, the SFPUC will accept the piping configuration as it has already been approved.
(b) RPs must be installed such that the lowest point of an assembly is a minimum of twelve inches above grade, and a maximum of thirty-six inches above the finished grade, unless an alternative is approved by the PWS.	These clearance requirements are included in Section 4, Installation, Replacement, and Relocation Requirements for Backflow Prevention Assemblies and Air Gaps.
(c) DCs installed or replaced after the adoption of the CCCPH must be installed according to CCCPH section 3.3.2 (b). Below ground installation can be considered if approved by the PWS where it determines no alternative options are available.	See Section 4, Installation, Replacement, and Relocation Requirements for Backflow Prevention Assemblies and Air Gaps. In some circumstances, the SFPUC may approve below-ground installations.
(d) A PVB or SVB must be installed a minimum of twelve inches above all downstream piping and outlets.	The SFPUC does not accept PVBs or SVBs for containment protection. PVB and SVB installation is overseen by SFDBI-PID following the CCSF Universal Plumbing Code. If an existing containment PVB fails and cannot be repaired, it must be replaced with an RP.
(e) SVBs may not be used for premises containment. PVBs may only be used for roadway right of way irrigation systems as premises containment where there is no potential for backpressure.	The SFPUC does not accept PVBs or SVBs for premises containment, including for irrigation systems. If an existing containment PVB fails and cannot be repaired, it must be replaced with an RP.

Cross-Walk of CCCPH Requirements and Manual

CCCPH Requirement	Response/Location in Manual
Chapter 3 Standards for Backflow Protection and Cross-Connection Control	
(f) A RP or DC installed after the adoption of the CCCPH must have a minimum side clearance of twelve inches, except that a minimum side clearance of twenty-four inches must be provided on the side of the assembly that contains the test cocks. The PWS may approve alternate clearances providing that there is adequate clearance for field testing and maintenance.	These clearance requirements are included in Section 4, Installation, Replacement, and Relocation Requirements for Backflow Prevention Assemblies and Air Gaps. The SFPUC may approve alternate clearances providing that there is adequate clearance for field testing and maintenance.
(g) Backflow protection must be located as close as practical to the water user's service connection unless one or more alternative locations have been approved by the PWS. If internal protection is provided in lieu of premises containment, the PWS must obtain access to the user premises and must ensure that the on-site protection meets the requirements of this Chapter for installation, field testing, and inspections.	For premises containment, the SFPUC requires backflow protection to be located as close as practical to the water user's service connection and in any case within 25 feet of it. See Section 4, Installation, Replacement, and Relocation Requirements for Backflow Prevention Assemblies and Air Gaps. The SFPUC may approve alternative locations beyond 25 feet if there are siting issues. If internal protection is provided in lieu of premises containment, the SFPUC or its Authorized Testers will access the user premises and ensure that the on-site protection meets the requirements of CCCPH Chapter 3 for installation, field testing, and inspections.
(h) Each BPA and air gap separation must be accessible for field testing, inspection, and maintenance.	See Section 4, Installation, Replacement, and Relocation Requirements for Backflow Prevention Assemblies and Air Gaps.
3.3.3 Field Testing and Repair of Backflow Prevention Assemblies and Air Gap Inspection (a) PWS must ensure that all BPAs installed for its Cross-Connection Control Program are field tested following installation, repair, depressurization for winterizing, or permanent relocation. All required field testing must be performed by certified backflow prevention assembly testers.	See Section 5, Testing, Inspection, and Repair Requirements for Backflow Prevention Assemblies and Air Gaps. For RPs issued with equipment for temporary connections to hydrants, SFPUC will require inspections and testing whenever the equipment is returned to SFWD or every six months, whichever is sooner. SFPUC will track inspection and test results in its MIS.

Cross-Walk of CCCPH Requirements and Manual

CCCPH Requirement	Response/Location in Manual
Chapter 3 Standards for Backflow Protection and Cross-Connection Control	
(b) BPAs must be field tested at least annually. The CCCPH does not preclude a PWS, the State Water Board, or a local health agency from requiring more frequent field testing for premises with high hazard cross-connection or BPA at increased risk of testing failure.	See Section 5, Testing, Inspection, and Repair Requirements for Backflow Prevention Assemblies and Air Gaps.
(c) Air-gap separations must be visually inspected at least annually to determine compliance with this Chapter by persons certified as backflow prevention assembly testers or certified as a cross connection control specialist pursuant to this Chapter.	See Section 5, Testing, Inspection, and Repair Requirements for Backflow Prevention Assemblies and Air Gaps.
(d) PWS must receive passing field tests before providing continuous service to a water user with a newly installed BPA.	SFDBI-PID ensures that BPAs have passed testing before signing off on plumbing permits.
(e) PWS must ensure that BPAs that fail the field test are repaired or replaced within 30 days of notification of the failure. Extensions may be allowed by the PWS if included as part of the Cross-Connection Control Plan.	The SFPUC strives to get BPAs that fail field tests repaired or replaced within 30 days of failure notification, but extensions may be allowed if the customer is working in good faith to have a BPA tested.
(f) PWS must require backflow prevention assembly testers to notify the PWS as soon as possible within 24 hours if a backflow incident or an unprotected cross-connection is observed at the BPA or prior to the user premises during field testing. PWS must immediately conduct an investigation and discontinue service to the user premises if a backflow incident is confirmed, and water service must not be restored to that user premises until the PWS receives a confirmation of a passing BPA field test from a backflow prevention assembly tester and the assembly is protecting the PWS.	Testers are required to notify the SFPUC on the same day if they observe a potential backflow incident, unprotected cross-connection, or other cross-connection issues or problem related to cross-connection control. The SFPUC will immediately (i.e., within a business day) conduct an investigation. The SFPUC will discontinue service to the user premises if there is a significant hazard (containment backflow risk) and not restore continuous service until it receives a passing BPA field test. The SFPUC may choose not to discontinue service to the user premises if the risk is small, reasonable mitigation can be quickly implemented, and the customer is working in good faith to correct the problem.

Cross-Walk of CCCPH Requirements and Manual

CCCPH Requirement	Response/Location in Manual
Chapter 3 Standards for Backflow Protection and Cross-Connection Control	
3.4.1 Backflow Prevention Assembly Tester Certification (a) A PWS must ensure that each BPA required by this Chapter to protect the public water system is field tested by a person with valid certification from a certifying organization recognized by the State Water Board pursuant to this Article.	See Section 11, Permits to Operate as an Authorized Backflow Prevention Tester or Cross-Connection Control Specialist.
(b) A State Water Board-recognized organization certifying backflow prevention assembly testers is one that has a certification process that, at a minimum, includes the following: See (b) through (g) in the CCCPH.	See Section 11, Permits to Operate as an Authorized Backflow Prevention Tester or Cross-Connection Control Specialist. The SFPUC only accepts certifications from organizations meeting the requirements set forth in the CCCPH. These organizations are listed in Appendix G, Tester and Specialist Certifying Associations Acceptable to the SFPUC.
3.4.2 Cross-Connection Control Specialist Certification (a) A PWS must ensure that cross-connection control specialists, used pursuant to the CCCPH, have valid certification from a certifying organization recognized by the State Water Board pursuant to this Article.	The SFPUC only accepts certifications from organizations meeting the requirements set forth in the CCCPH. These organizations are listed in Appendix G, Tester and Specialist Certifying Associations Acceptable to the SFPUC.
(b) A State Water Board-recognized organization certifying cross-connection control specialists is one that has a certification process that, at a minimum, includes the following: See (B) through (g) in the CCCPH.	The SFPUC only accepts certifications from organizations meeting the requirements set forth in the CCCPH. These organizations are listed in Appendix G, Tester and Specialist Certifying Associations Acceptable to the SFPUC.
Article 5: Recordkeeping, Backflow Incident Response, and Notification	
3.5.1 Recordkeeping (a) Each PWS must maintain the following records: (1) The two most recent hazard assessments for each user premise, conducted pursuant to CCCPH section 3.2.1 (Hazard Assessment); (2) for each BPA, the associated hazard or application, location, owner, type, manufacturer and model, size, installation date, and serial number; (3) for each AG installation, the associated hazard or application and the location, owner, and as-built plans of the AG;	See Section 17, Recordkeeping. Table 17-1 lists the CCCPH-required records and where the SFPUC stores each one.

Cross-Walk of CCCPH Requirements and Manual

CCCPH Requirement	Response/Location in Manual
Chapter 3 Standards for Backflow Protection and Cross-Connection Control	
(4) results of all BPA field testing, AG inspection, and swivel-ell inspections and field tests for the previous three calendar years, including the name, test date, repair date, and certification number of the backflow prevention assembly tester for each BPA field test and AG and swivel-ell; (5) repairs made to, or replacement or relocation of, BPAs for the previous three calendar years; (6) the most current cross-connection tests (e.g. shutdown test, dye test); (7) if a user supervisor is designated for a user premise, the current contact information for the user supervisor and water user, and any applicable training and qualifications as described by CCCPH section 3.2.2(f); (8) descriptions and follow-up actions related to all backflow incidents; (9) if any portion of the cross-connection control program is carried out under contract or agreement, a copy of the current contract or agreement; (10) the current Cross-Connection Control Plan as required in CCCPH section 3.1.4.; and (11) any public outreach or education materials issued as required in CCCPH section 3.1.3.(a)(9) for the previous three calendar years.	
(b) All information in subsection (a) must be available to the State Water Board upon request.	All information in (a) will be made available to the SWRCB upon request.
3.5.2 Backflow Incident Response Procedures Each PWS must include backflow incident response procedures in the Cross Connection Control Plan required in CCCPH section 3.1.4. The PWS must describe its procedures for investigating and responding to suspected backflow incidents including, but not limited to, the following:	See Section 2.5, Responding to Complaints and Reports of Cross-Connections, and Section 16, Emergency Cross-Connection Response.

Cross-Walk of CCCPH Requirements and Manual

CCCPH Requirement	Response/Location in Manual
Chapter 3 Standards for Backflow Protection and Cross-Connection Control	
(a) Consideration of complaints or reports of changes in water quality as possible incidents of backflow; (b) Water quality sampling and pressure recording; and	See Section 2.5, Responding to Complaints and Reports of Cross-Connections.
(c) Documentation of the investigation, and any response and follow-up activities.	WQD Inspectors document investigations, response, and follow-up in either SFPUC's 311 complaint database (if the complaint originated with the customer) or SFPUC's filesharing site (if the complaint originated internally to SFPUC).
3.5.3 Backflow Incident Notification (a) Each PWS must notify the State Water Board and local health agencies of any known or suspected incident of backflow within 24 hours of the determination. If required by the State Water Board, a PWS must issue a Tier 1 public notification pursuant to CCR, Title 22, Section 64463.1.	See Section 16.2, Notifications.
(b) If required by the State Water Board, the PWS must submit, by a date specified by the State Water Board, a written incident report describing the details and affected area of the backflow incident, the actions taken by the PWS in response to the backflow incident, and the follow up actions to prevent future backflow incidents. The written report must contain, at a minimum, the information requested in Appendix F.	See Section 16.2, Notifications.

APPENDIX B

Cross-Connection Control Program Staff

Cross-Connection Control Program Certified Staff (as of July 29, 2025)

A cross-connection control specialist is available 24/7 via the SFPUC's "311 Customer Service Center," which can be reached by dialing 311 from a phone with a 415 area code or by dialing (415) 701-2311 from a phone with a different area code.

WQD Staff

Function	Name and Position	Certification ¹	Phone #	Email
Cross-Connection Control Program Coordinator (Primary)	Kenneth Payne Chief Water Service Inspector	Specialist #10296 Tester #08788	O: (650) 652-3132 C: (650) 238-4321	kpayne@sfgwater.org
Cross-Connection Control Program Coordinator (Secondary)	Donald Do Senior Water Service Inspector	Specialist #2757 Tester #16015	O: (650) 652-3143 C: (415) 500-1651	dmdo@sfgwater.org
Certified staff	Meghan Chen Water Quality Technician	Specialist #03720 Tester #19880	C: (415) 308-7545	mcheng@sfgwater.org
Certified staff	Dennis Edwards Water Service Inspector	Specialist #02082 Tester #000564	O: (650) 652-3171 C: (650) 393-0317	dedwards@sfgwater.org
Certified staff	Roselle Ferrer Senior Water Service Inspector	Specialist #02428 Tester #12967	O: (650) 652-3128 C: (650) 438-9942	rferrer@sfgwater.org
Certified staff	Ronaldo Gallega Water Service Inspector	Specialist #03080 Tester #16797	O: (650) 652-3151 C: (628) 230-0440	rgallega@sfgwater.org
Certified staff	Roberto Gonzales Water Service Inspector	Specialist #02779 Tester #16105	O: (650) 652-3150 C: (415) 205-2753	rvgonzales@sfgwater.org
Certified staff	Mark Johnson Water Service Inspector	Specialist # 3305 Tester # 17767	O: (650) 652-3133 C: (415) 757-8473	mejohanson@sfgwater.org
Certified staff	Sue Soteriou Water Service Inspector	Specialist #02015 Tester #12555	O: (650) 652-3131 C: (650) 303-9752	ssoteriou@sfgwater.org

¹ All certifications are from the California-Nevada section of the American Water Works Association.

Supporting Staff

Function	Name and Position	Certification	Phone #	Email
SFDPH-EH certified staff supporting SFPUC	Arthur Duque Senior Health Inspector	Specialist #03839 ¹ Tester #19718 ¹	O: (415) 252-3966	arthur.duque@sfdph.org
Tester for SFWD RPs on hydrant meter equipment	Nate Gibson Water Meter Repairer	Tester #000675 ²	O: (415) 550-4969 C: (415) 697-5271	ngibson@sfgwater.org

1 Certification from the California-Nevada section of the American Water Works Association.

2 Certification from the Northern California Backflow Prevention Association.

APPENDIX C

Regulations Applicable to Cross-Connection Control

San Francisco Health Code, Article 12A
(Backflow Prevention)

San Francisco Health Code, Article 12C
(Alternate Water Sources for Non-Potable Applications)

SFPUC Rules and Regulations Governing Water Service to Customers,
Section G (Cross-Connection Control)

SFPUC Rules and Regulation Governing Hydrant Use for
Temporary Water Supply (Excerpt related to
SFFD Connections to Hydrants)

SFPUC Rules and Regulations for Users Receiving Recycled Water
Service in the City and County of San Francisco

SFDPH-EH Director's Rules and Regulations Regarding the
Operation of Alternate Water Source Systems

Excerpt from California Department of Public Health (Now SWRCB)
Compliance Order 02-04-95CO-006

SWRCB Cross-Connection Control Policy Handbook

San Francisco Health Code, Article 12A (Backflow Prevention)

ARTICLE 12A:

BACKFLOW PREVENTION

Sec. 12A.1.	Purpose and Findings.
Sec. 12A.2.	Definitions.
Sec. 12A.3.	Scope of Article.
Sec. 12A.4.	Compliance with Cross-connection Controls.
Sec. 12A.5.	Backflow Prevention Requirements.
Sec. 12A.6.	Cross-connection Testing Requirements for Dual-plumbed Systems.
Sec. 12A.7.	Authorized Backflow Prevention Assembly Tester and Cross-connection Control Specialist Requirements.
Sec. 12A.8.	Companies Employing Authorized Backflow Prevention Assembly Testers or Authorized Cross-connection Control Specialists.
Sec. 12A.9.	Inspection and Notices.
Sec. 12A.10.	Violations, Enforcement Activities, and Penalties.
Sec. 12A.11.	Promotion of the General Welfare.

SEC. 12A.1. PURPOSE AND FINDINGS.

The Board of Supervisors finds that:

- (a) The City's potable Public Water System must be protected from contamination by the implementation of a cross-connection control program.
- (b) The State of California requires the City, as the public water supplier, to implement the cross-connection control program, and allows implementation of the program by the public water supplier or by means of contract between the public water supplier and the local health agency.
- (c) Under the Charter, the authority and responsibility for managing and operating the City's Public Water System is vested in the San Francisco Public Utilities Commission. The City's local health agency, the Department of Public Health, should cooperate with the San Francisco Public Utilities Commission in implementing the City's cross-connection control program.
- (d) The dangers to public health and safety posed by the potential contamination of the City's potable water system warrant the imposition of local regulations and standards in excess of those required under State law.

■ (Added by Ord. [100-16](#), File No. 160294, App. 6/17/2016, Eff. 7/17/2016)

SEC. 12A.2. DEFINITIONS.

The following terms used in this Article 12A have the meanings set forth below:

"Approved Air Gap Separation" shall mean a physical break between the water supply line and a receiving vessel, that has been approved by the General Manager and is in proper working order.

"Approved Backflow Prevention Assembly" shall mean a device used to prevent the Backflow of substances into the Public Water System that has been approved for such use by a recognized testing organization acceptable to the General Manager and is in proper working order.

"Authorized Backflow Prevention Assembly Tester" shall mean any person who possesses a valid certification to test, repair, and maintain Backflow prevention assemblies and is authorized by the General Manager to do such work in the City in accordance with Section 12A.7 of this Article 12A.

"Authorized Cross-connection Control Specialist" shall mean any person who possesses a valid certification to administer a cross-connection control test and to conduct site surveys to assess cross-connection control requirements and is authorized by the General Manager to do such work in the City in accordance with Section 12A.7 of this Article 12A.

"Auxiliary Water" shall mean any water other than that received from the Public Water System, including, but not limited to, recycled water, wastewater, graywater, groundwater, and rainwater.

"Backflow" shall mean the flow of water, from any source or sources, into the Public Water System that is of unknown or questionable safety for human consumption, or of other liquids, gases, mixtures, or other substances that flow into the Public Water System.

"Backflow Preventer" shall mean an Approved Backflow Prevention Assembly or Approved Air Gap Separation.

"Backflow Tag" shall mean an identification document provided by the General Manager to Authorized Backflow Prevention Assembly Testers to be affixed to an Approved Backflow Prevention Assembly after it has passed testing.

"Containment" shall mean protection from Backflow at the service connection.

"Cross-connection" shall mean any unprotected actual or potential connection between any part of a potable water system used or potentially used to supply water for drinking purposes and any source or system containing water or any other substance that is not or cannot be approved as safe, wholesome, and potable.

"Cross-connection Control Survey" shall mean an inspection of all parts of a Property with a Water Service Connection to identify potential Cross-connections.

"Cross-connection Test" shall mean a test administered by an Authorized Cross-connection Control Specialist to verify that there is no physical uncontrolled connection between the potable water piping and any Auxiliary Water piping system.

"Dual-plumbed" shall mean a system that utilizes separate piping systems for Auxiliary Water and potable water within a Property.

"First Certificate of Occupancy" shall mean either a temporary certificate of occupancy or a certificate of final completion and occupancy, as defined in San Francisco Building Code Section 109A, whichever is issued first.

"General Manager" shall mean the General Manager of the San Francisco Public Utilities Commission, or his or her designee.

"On-site Hazard" shall mean any actual or potential contamination or pollution risk to the public water supply created as a result of conditions existing on a Property.

"Point of Connection" shall mean the water meter, or, for dedicated fire services, the function of the water supply lateral and the Property's fire protection system.

"Property" shall mean any parcel, premises, building, or other structure that receives potable water from the Public Water System.

"Property Owner" shall mean the legal owner of a Property with a Water Service Connection to the Public Water System.

"Public Water System" shall mean the potable water system operated and maintained by the San Francisco Public Utilities Commission.

"Water Service Connection" shall mean a connection to the Public Water System.

■ (Added by Ord. [100-16](#), File No. 160294, App. 6/17/2016, Eff. 7/17/2016)

SEC. 12A.3. SCOPE OF ARTICLE.

As a condition of receiving water service from the Public Water System, Property Owners shall install an approved Backflow Preventer on their Property prior to receiving potable water on any Property where any of the following exist:

- (a) A waste-water pumping and/or treatment plant.
- (b) The handling of a hazardous substance in any manner in which the substance could enter the Public Water System.
- (c) An Auxiliary Water supply.
- (d) Dual-plumbed property.
- (e) Intricate plumbing and piping arrangements.
- (f) A repeated history of Cross-connections.
- (g) A dockside watering point or marine facility.
- (h) Dedicated irrigation service.
- (i) A fire protection system.
- (j) A building where the highest point is 40 feet or more in height above the point of connection.
- (k) Inadequate Backflow prevention for any on-site process that the General Manager identifies as requiring additional protection from Backflow.
- (l) Restricted entry to the Property or parts of the Property that inhibit performance of a Cross-connection inspection.
- (m) Multiple service connections where at least one such connection requires Backflow protection for Containment.
- (n) A water storage facility not under control of the Public Water System.
- (o) Any other hazard that the General Manager identifies as requiring abatement to protect the Public Water System from contamination.

■ (Added by Ord. [100-16](#), File No. 160294, App. 6/17/2016, Eff. 7/17/2016)

SEC. 12A.4. COMPLIANCE WITH CROSS-CONNECTION CONTROLS.

- (a) Property Owners shall maintain and operate connections with the Public Water System in compliance with this Article 12A, regulations adopted by the General Manager, and all applicable local, state, and federal laws.
- (b) Property Owners with connections to the Public Water System shall not install, maintain, or allow Cross-connections that are not protected from actual or potential Backflow.

(c) No City department shall approve or issue a First Certificate of Occupancy for any Property subject to this Article 12A unless and until the approved Backflow Preventer has been tested and certified in accordance with this Article and regulations adopted by the General Manager.

(d) No City department shall approve or issue a First Certificate of Occupancy for any Dual-plumbed property unless and until the system has passed a Cross-connection Test and been certified in accordance with this Article 12A and regulations adopted by the General Manager.

– (Added by Ord. [100-16](#), File No. 160294, App. 6/17/2016, Eff. 7/17/2016)

SEC. 12A.5. BACKFLOW PREVENTION REQUIREMENTS.

(a) Backflow Preventers for Containment shall be installed as close as practical to but in any case within 25 feet of the downstream side of the water meter or Point of Connection to the Public Water System.

(b) Backflow Preventers shall be installed that are commensurate with the risk that exists at each Property, in accordance with criteria set forth in regulations adopted by the General Manager.

(c) All Approved Backflow Prevention Assemblies, prior to installation, shall have passed laboratory and field evaluation tests performed by a recognized testing organization acceptable to the General Manager that has demonstrated competency to perform such tests. Approved Backflow Prevention Assemblies that have been modified or installed in a manner that differs from the configuration tested and approved are prohibited.

(d) Approved Backflow Prevention Assemblies, as installed, shall be field tested in accordance with this Article 12A to determine that they are functioning properly before being placed into service.

(e) No person shall use water from or connect any apparatus to a City fire hydrant without first obtaining a permit and a water meter from the San Francisco Public Utilities Commission. All portable water meters intended for use with hydrants shall include backflow prevention in accordance with the regulations adopted by the General Manager.

(f) The Property Owner shall be responsible for field testing all Approved Backflow Prevention Assemblies upon installation, relocation, or repair, and annually after each such action, or more frequently if determined necessary by the General Manager to eliminate an On-site Hazard.

(g) Backflow prevention assembly tests and inspections required under this Article 12A shall be performed by an Authorized Backflow Prevention Assembly Tester at the sole expense of the Property Owner.

(1) When an Approved Backflow Prevention Assembly is inspected and has passed the testing procedure, the Authorized Backflow Prevention Assembly Tester shall:

(A) Immediately affix a Backflow Tag to the assembly.

(B) Submit certification documentation to the General Manager and the Property Owner within five business days of the completion of each inspection and test.

(2) Approved Backflow Prevention Assemblies that fail to pass inspection and testing shall be repaired, overhauled, or replaced, and immediately retested at the sole expense of the Property Owner.

(Added by Ord. [100-16](#), File No. 160294, App. 6/17/2016, Eff. 7/17/2016)

SEC. 12A.6. CROSS-CONNECTION TESTING REQUIREMENTS FOR DUAL-PLUMBED SYSTEMS.

(a) The Property Owner shall be responsible for testing all Dual-plumbed systems for Cross-connections upon installation and periodically thereafter as required in accordance with regulations adopted by the General Manager.

(b) Cross-connection Tests and inspections shall be performed by an Authorized Cross-connection Control Specialist at the sole expense of the Property Owner.

(c) The Authorized Cross-connection Control Specialist shall submit a written report documenting the results of the inspection and testing to the General Manager and the Property Owner within five business days of each inspection or test.

(d) If a Cross-connection is identified during inspection and testing, the Property Owner or Authorized Cross-connection Control Specialist shall:

(1) Immediately notify the General Manager of the existence of the Cross-connection.

(2) Immediately shut off the Auxiliary Water supply at the source.

(3) Follow the procedure for eliminating the Cross-connection, retesting, and reestablishing water service in accordance with regulations adopted by the General Manager.

(e) If a Cross-connection is discovered, the General Manager may shut off the potable water supply to the Property at the water meter or other connection to the Public Water System.

(f) **Recordkeeping.** Property Owners shall maintain Cross-connection testing and inspection records for a period of three years, in accordance with regulations adopted by the General Manager. The records shall be made available to the General Manager at the request of the General Manager.

■ (Added by Ord. [100-16](#), File No. 160294, App. 6/17/2016, Eff. 7/17/2016)

SEC. 12A.7. AUTHORIZED BACKFLOW PREVENTION ASSEMBLY TESTER AND CROSS-CONNECTION CONTROL SPECIALIST REQUIREMENTS.

(a) Only Authorized Backflow Prevention Assembly Testers may test Backflow prevention assemblies in the City.

(b) Only Authorized Cross-connection Control Specialists may conduct Cross-connection Tests in the City.

(c) All Authorized Backflow Prevention Assembly Testers and Authorized Cross-connection Control Specialists must obtain a permit to operate, issued in accordance with regulations adopted by the General Manager. To receive and maintain a permit to operate, Authorized Backflow Prevention Assembly Testers and Authorized Cross-connection Control Specialists must:

(1) Hold a valid certification as a Backflow prevention assembly tester and/or Cross-connection Control Specialist from an organization approved by the General Manager.

(2) Maintain or be covered by general liability insurance in full force and effect, in accordance with regulations adopted by the General Manager.

(d) A person may simultaneously hold separate permits to operate as an Authorized Backflow Prevention Assembly Tester and as an Authorized Cross-connection Control Specialist.

(e) Following a hearing that comports with due process, the General Manager at any time may suspend or revoke a permit to operate for violation of any provision of this Article 12A or any regulation adopted to implement this Article.

■ (Added by Ord. [100-16](#), File No. 160294, App. 6/17/2016, Eff. 7/17/2016)

SEC. 12A.8. COMPANIES EMPLOYING AUTHORIZED BACKFLOW PREVENTION ASSEMBLY TESTERS OR AUTHORIZED CROSS-CONNECTION CONTROL SPECIALISTS.

(a) In order to operate in the City, companies or other entities that employ Authorized Backflow Prevention Assembly Testers or Authorized Cross-connection Control Specialists shall:

(1) Register with the General Manager by providing documentation required under regulations adopted by the General Manager.

(2) Maintain general liability insurance in full force and effect, at the expense of the company or other entity, for all activities performed by their Authorized Backflow Prevention Assembly Testers or Authorized Cross-connection Control Specialists, consistent with regulations adopted by the General Manager.

(3) Provide the General Manager with the names of the Authorized Backflow Prevention Assembly Testers and Authorized Cross-connection Control Specialists working for them and notify the General Manager when such employees leave the company or other entity.

(4) Maintain continuous records of all activities performed in relation to Backflow prevention in the City for three years, in accordance with regulations adopted by the General Manager. The records shall be made available to the General Manager at the request of the General Manager.

(b) Following a hearing that comports with due process, the General Manager may suspend or revoke a company or other entity's authorization to conduct testing of Backflow prevention assemblies or any Cross-connection control activities at any time for violation of any provision of this Article 12A or any regulation implementing this Article.

■ (Added by Ord. [100-16](#), File No. 160294, App. 6/17/2016, Eff. 7/17/2016)

SEC. 12A.9. INSPECTION AND NOTICES.

(a) As a condition of receiving water service, the Property Owner shall permit the General Manager to inspect any Property subject to the requirements of this Article 12A to determine compliance with the provisions of this Article and applicable laws and regulations.

(b) Upon written notification by the General Manager, a Property Owner shall eliminate any unprotected Cross-connections within seven days of receipt of the notification, unless the General Manager authorizes an alternate deadline for remediation.

(c) If a Property Owner refuses or fails to eliminate a Cross-connection within the required time, the General Manager may proceed with enforcement activities in accordance with this Article 12A and regulations adopted by the General Manager.

■ (Added by Ord. [100-16](#), File No. 160294, App. 6/17/2016, Eff. 7/17/2016)

SEC. 12A.10. VIOLATIONS, ENFORCEMENT ACTIVITIES, AND PENALTIES.

(a) Any Property Owner who violates any provision of this Article 12A or any regulation implementing this Article shall be subject to enforcement, including, but not limited to:

(1) Installation of a flow restrictor, with applicable fees as specified under regulations adopted by the San Francisco Public Utilities Commission.

(2) Disconnection of the noncompliant water service(s) until the Cross-connection has been eliminated and appropriate fees have been paid, including but not limited to service shut-off and service turn-on fees as specified under regulations adopted by the San Francisco Public Utilities Commission.

(3) Any other enforcement action deemed necessary by the General Manager and the City Attorney to protect the Public Water System, including but not limited to seeking judicial remedies.

(b) If a Property Owner refuses or fails to eliminate a Cross-connection, and disconnecting water service would cause significant disruption to building occupants and/or emergency response agencies, the General Manager may test, repair and/or replace a Backflow Prevention Assembly, or take other required action to eliminate the Cross-connection. The Property Owner shall be required to pay for all costs of such action.

(c) Whenever the General Manager determines that an existing or potential unprotected Cross-connection poses an imminent risk of hazard to the Public Water System and requires immediate abatement, the General Manager may immediately shut off water service to the Property at the meter until the Cross-connection has been eliminated and necessary payments have been made for turn-on services as specified under regulations adopted by the General Manager.

(d) Any Property Owner who violates any provision of this Article 12A or any regulation implementing this Article shall be subject to the imposition, enforcement, collection, and review of administrative fines, and any other available legal remedies in accordance with Chapter 100 of the Administrative Code, which is incorporated herein in its entirety and which shall govern the imposition, enforcement, collection, and review of administrative fines issued to enforce this Article 12A and any rule or regulation adopted pursuant to this Article 12A, provided that:

(1) Each day a violation is committed or permitted to continue shall constitute a separate violation;

(2) The amount of the fine for violation of this Article 12A shall be up to \$1,000 per violation per day;

(3) The General Manager is the charging official authorized under this Article 12A;

(4) The General Manager shall appoint the hearing officer to conduct hearings for appeals, and said hearing officer shall determine the time and place of such hearings, and provide appropriate notice of such hearings;

(5) The fine for any violation issued pursuant to this Section 12A.10 shall be paid to the Treasurer of the City and County of San Francisco and credited to the appropriate San Francisco Public Utilities Commission Water Enterprise fund;

(6) The General Manager may recover any costs and fees, including but not limited to attorneys' fees, for enforcement initiated through this Section 12A.10 and authorized under this Article 12A.

(7) The Board of Supervisors finds that Cross-connections between real properties and the Public Water System create a direct public health risk to the Public Water System, and thus a violation of this Article 12A will have a nexus between the violation and real property located in the City. In accordance with the requirements of Chapter 100 of the Administrative Code, the General Manager may provide notice of enforcement action to the owner of the real property and that unpaid Public Utilities Commission fines for the citations may become a lien on the Property, and the General Manager may collect such fines.

■ (Added by Ord. [100-16](#), File No. 160294, App. 6/17/2016, Eff. 7/17/2016)

SEC. 12A.11. PROMOTION OF THE GENERAL WELFARE.

In enacting and implementing this Article 12A, the City is assuming an undertaking only to promote the general welfare. It is not assuming, nor is it imposing on its officers and employees, an obligation for breach of which it is liable in money damages to any person who claims that such breach proximately caused injury.

(Added by Ord. [100-16](#), File No. 160294, App. 6/17/2016, Eff. 7/17/2016)

**San Francisco Health Code, Article 12C
(Alternate Water Sources for Non-Potable Applications)**

ARTICLE 12C:

ALTERNATE WATER SOURCES FOR NON-POTABLE APPLICATIONS

Sec. 12C.1.	Purpose and Findings.
Sec. 12C.2.	Definitions.
Sec. 12C.3.	Applicability.
Sec. 12C.4.	Development Project Requirements.
Sec. 12C.5.	Regulation of Alternate Water Sources.
Sec. 12C.6.	Project Applicant and/or Permittee Design and Construction Requirements.
Sec. 12C.7.	Fees.
Sec. 12C.8.	Operating Requirements.
Sec. 12C.9.	Non-potable Water Use Audits.
Sec. 12C.10.	Sale or Transfer.
Sec. 12C.11.	Inspection.
Sec. 12C.12.	Violation and Penalties.
Sec. 12C.13.	Revocation and Suspension of Permit.

Editor's Note:

The sections of this Article are numbered out of sequence with the other articles of this Code.

SEC. 12C.1. PURPOSE AND FINDINGS.

The Board of Supervisors finds that:

- (a) All California water users are responsible for making effective use of the available water resources.
- (b) The development of alternate water source systems will assist in meeting future water requirements of the City and lessen the impacts of new developments on the City's sewer system.
- (c) Establishing a regulatory structure that provides administrative efficiency and a streamlined project approval process will assist developers who opt to design, install, operate, and maintain alternate water source systems.
- (d) Adoption of Article 12C by the Board of Supervisors and adoption of rules and regulations by the Department of Public Health will help achieve the City's goals for water supply use and preservation by:
 - (1) Promoting the values and benefits of non-potable water use while recognizing the need to invest water and other resources as efficiently as possible;
 - (2) Encouraging the use of non-potable water for non-potable applications; and
 - (3) Replacing potable water use for toilet and urinal flushing and irrigation to the maximum extent possible with alternative water sources.

(e) It shall be City policy that within five years of the effective date of Ordinance No. 109-15,¹ adding this subsection (e) to Article 12C, the City shall use only non-potable water for the purpose of irrigating and cleaning parks, streets, and other public spaces. Within two years of the effective date of that ordinance, the City Administrator, in consultation as appropriate with other City departments, boards, and commissions, including, among others, the Recreation and Park Department, Department of Public Works, Port of San Francisco, San Francisco International Airport, Division of Real Estate, and Capital Planning Committee, shall study what will be required to accomplish this policy, including associated costs, and report the results of the study to the Mayor and Board of Supervisors. Upon receiving this study, the Board of Supervisors intends to evaluate any changes to the law and Capital Plan needed to implement this policy.

(f) The General Manager of the San Francisco Public Utilities Commission shall submit a report to the Board of Supervisors by December 31, 2021, evaluating the challenges of, and opportunities for requiring the construction, operation and maintenance of Non-potable District Systems at District Development Projects. The report shall also identify the opportunities for the expansion of water heating systems including, but not limited to thermal solar hot water preheating systems, graywater preheating systems, wastewater heat recovery systems, and geo-thermal hot water preheating systems.

(g) In order to further determine opportunities to maximize and expand the use of nonpotable sources of water, the General Manager of the San Francisco Public Utilities Commission shall submit to the Board of Supervisors by June 1, 2022, a report evaluating opportunities to develop a recycled water and purified water supply for San Francisco.

(h) The General Manager of the San Francisco Public Utilities Commission shall submit a report to the Board of Supervisors by December 31, 2022, identifying the opportunities for biogas utilization and energy recovery from the San Francisco Public Utilities Commission's Biosolids Digester Facilities Project.

(Added as Sec. 850 by Ord. [195-12](#), File No. 120717, App. 9/17/2012, Eff. 10/17/2012; redesignated and amended by Ord. [109-15](#), File No. 150350, App. 7/2/2015, Eff. 8/1/2015; amended by Ord. [155-21](#), File No. 210536, App. 10/8/2021, Eff. 11/8/2021)

CODIFICATION NOTE

- 1. Blank in Ord. [109-15](#). Ordinance number inserted by the codifier.

SEC. 12C.2. DEFINITIONS.

The terms used in this Article 12C have the meaning set forth below:

100% Affordable Housing Project: a building where 100% of the residential units (not including a manager's unit) have (1) a maximum affordable purchase price or affordable rent set at 120% of the unadjusted area median family income as determined by the Mayor's Office of Housing and Community Development on an annual basis and derived from the HUD Metro Fair Market Rent Area that contains San Francisco; (2) a rent that does not exceed 30% of the applicable household income limit for a rental unit, or a purchase price with an annual housing cost that does not exceed 33% of the applicable income limit for an owner-occupied unit, as may be adjusted for household size and bedroom count; and (3) a recorded regulatory agreement, consistent with any applicable federal, state, or City government regulatory requirements, to assure that the residential units are sold or rented in accordance with the above criteria for the life of the project or a minimum of 55 years, whichever is shorter.

100% Permanent Supportive Housing Project: a new building where 100% of the residential units (not including a manager's unit) are (1) owned by a nonprofit charitable organization or qualified related legal entity, (2) used for permanent supportive housing to formerly homeless households subject to a recorded declaration of restriction, and (3) funded through a subsidy agreement with the Department of Homelessness and Supportive Housing.

Alternate Water Source: a source of Non-potable water that includes Graywater, on-site treated Non-potable water, Rainwater, Stormwater, Foundation Drainage, Blackwater, and any other source approved by the Director.

Alternate Water Source System: The system of facilities necessary for providing Non-potable Water for use in a Development Project, including but not limited to all collection, treatment, storage, and distribution facilities. Non-potable Water System shall have the same meaning.

Blackwater: wastewater containing bodily or other biological wastes, as from toilets, dishwashers, kitchen sinks, and utility sinks.

City: the City and County of San Francisco.

Commercial Building: a building with a commercial use as defined in Planning Code Section 102, amended from time to time.

Condensate: water vapor collected from air conditioning systems.

Development Project: Construction of a new building or buildings. Development Projects are Large Development Projects and Small Development Projects. Development Project does not include rehabilitation of buildings constructed prior to August 1, 2015. Development Project does not include (1) any 100% Affordable Housing Project, 100% Permanent Supportive Housing Project, housing project funded or constructed pursuant to the HOPE SF Program sponsored and developed by the San Francisco Housing Authority and either the Mayor's Office of Housing and Community Development or the Office of Community Investment and Infrastructure, or housing project that is issued a First Construction Document, as that term is defined in Building Code Section 107A.13.1, prior to July 1, 2025, uses California Debt Limit Allocation Committee tax-exempt bond financing and tax credits under the Tax Credit Allocation Committee, as set forth in Planning Code Section 415.6(h)(2)(B), and provides at least 100 total on-site affordable units; (2) Hospital Buildings, Health Service Buildings, and Institutional Healthcare Use Buildings; (3) Industrial Use Buildings; (4) Production, Distribution, and Repair Use Buildings; (5) construction of a new building that will receive water service from the San Francisco Public Utilities Commission through no larger than a 5/8" domestic water meter or a 5/8" recycled water domestic meter, as determined in accordance with the San Francisco Public Utilities Commission's rules for water service; (6) for District projects located within the boundaries of the Reclaimed Water Use Map, construction of new buildings subject to a disposition and development agreement or similar contractual agreement approved before November 1, 2015, that includes in its applicable infrastructure plan the construction and operations of water treatment facilities within the project boundaries that would provide recycled water to the project; (7) for District projects located within the boundaries of the Reclaimed Water Use Map, construction of new buildings subject to a development agreement or similar contractual agreement, within a development phase or subphase, a street improvement plan, or a tentative map or vesting tentative map approved before November 1, 2015; or (8) for District projects located outside the boundaries of the Reclaimed Water Use Map, construction of new buildings subject to a development agreement or similar contractual agreement, within a development phase or subphase, a street improvement plan, or a tentative map or vesting tentative map approved before November 1, 2017.

Director: the Director of Health or any individual designated by the Director to act on the Director's behalf.

District Development Project: a Large Development Project consisting of two or more buildings.

District System: An Alternate Water Source System serving a District Development Project.

First Certificate of Occupancy: either a temporary certificate of occupancy or a Certificate of Final Completion and Occupancy as defined in San Francisco Building Code Section 109A, whichever is issued first.

Foundation Drainage: nuisance groundwater that is extracted to maintain a building's or facility's structural integrity and would otherwise be discharged to the City's sewer system. Foundation Drainage does not include non-potable groundwater extracted for a beneficial use that is subject to City groundwater well regulations.

General Manager: the General Manager of the San Francisco Public Utilities Commission, or any individual designated by the General Manager to act on his or her behalf.

Graywater: untreated wastewater that has not been contaminated by any toilet discharge, has not been affected by infectious, contaminated, or unhealthy bodily wastes, and does not present a threat from

contamination by unhealthful processing, manufacturing, or operating wastes. Graywater includes, but is not limited to, wastewater from bathtubs, showers, bathroom sinks, lavatories, clothes washing machines, and laundry tubs, but does not include wastewater from toilets, kitchen sinks, utility sinks, or dishwashers.

Gross Floor Area: The floor area of a Development Project as defined in Planning Code Section 102, as amended from time to time.

Health Service Building: A building with a health service use as defined in Planning Code Section 102, as amended from time to time.

Hospital Building: A building with a hospital use as defined in Planning Code Section 102, as amended from time to time.

Industrial Use Building: A building with an industrial use as defined in Planning Code Section 102, as amended from time to time.

Institutional Healthcare Use Building: A building with an institutional healthcare Use as defined in Planning Code Section 102, as amended from time to time.

Large Development Project:

(a) Prior to January 1, 2022, a Large Development Project is the construction of a single building, or construction of multiple buildings on one or more parcels in accordance with a phased plan or approval, with a total Gross Floor Area for the single building or the multiple buildings of 250,000 square feet or more:

(1) located within the boundaries of the Reclaimed Water Use Map designated in accordance with Sections 1203 and 1209 of the Public Works Code and subject to a site permit or building permit that is final and effective after November 1, 2015; or

(2) located outside the boundaries of the Reclaimed Water Use Map designated in accordance with Sections 1203 and 1209 of the Public Works Code and subject to a site permit or building permit that is final and effective after November 1, 2016.

(b) On or after January 1, 2022, a Large Development Project is the construction of a single building, or construction of multiple buildings on one or more parcels in accordance with a phased plan or approval, with a total Gross Floor Area for the single building or the multiple buildings of 100,000 square feet or more.

(c) Large Development Projects include, to the extent allowed by law, buildings constructed and operated by any local, state, or federal government entity, including the City.

Large Development Project Applicant: The person or entity applying for authorization to construct and operate a Large Development Project.

Mixed-Use Residential Building: A building with both a residential use and a commercial use as defined in Planning Code Section 102.

Multi-Family Residential Building: A building that contains three or more dwelling units.

Non-potable Water: water collected from Alternate Water Sources.

Non-potable Water Engineering Report: Report submitted by the Project Applicant to the Director describing the Alternate Water Source System in accordance with the rules and regulations adopted by the Department of Health.

Nonpotable Water System: The same meaning as Alternate Water Source System.

Non-Residential Building: A building with a non-residential use as defined in Planning Code Section 102.

Permittee: The Project Applicant, or any subsequent owner, assignee, successor in interest or any other transferee subject to this Article 12C, including, but not limited to, operations and maintenance of an Alternative

Water Source System. Permittee includes, but is not limited to, the owner of the common areas within a District Development Project and any homeowners association or similar entity that maintains the common areas within a District Development Project. Permittee does not include the Project Applicant, subsequent owners, assignees, successors in interests, transferees, owners of a common area, homeowners associations, or any other person or entity associated with a Development Project serviced by an Alternative District System dedicated to the City in accordance with Section 12C.4(h) of this Article 12C.

Production, Distribution, Repair Use Building: A building with production, distribution, repair Use as defined in Planning Code Section 102.

Project Applicant: the person or entity applying for authorization to install and use an Alternate Water Source System.

Rainwater: precipitation collected from roof surfaces or other manmade, aboveground collection surfaces.

Small Development Project:

(a) Prior to January 1, 2022, a Small Development Project is the construction of a single building, or construction of multiple buildings on one or more parcels in accordance with a phased plan or approval, with a total Gross Floor Area for the single building or the multiple buildings of 40,000 square feet or more, but less than 250,000 square feet.

(b) On or after January 1, 2022, a Small Development Project is the construction of a single building, or construction of multiple buildings on one or more parcels in accordance with a phased plan or approval, with a total Gross Floor Area for the single building or the multiple buildings of 40,000 square feet or more, but less than 100,000 square feet.

(c) Small Development Projects include, to the extent allowed by law, buildings constructed and operated by any local, state, or federal government entity, including the City.

Small Development Project Applicant: The person or entity applying for authorization to construct and operate a Small Development Project.

Small Residential Building: A building that contains no more than two dwelling units.

Stormwater: Precipitation collected from at-grade or below-grade surfaces.

Water Budget: The calculation of the potential volume of onsite Alternate Water Source supplies and demands of a Development Project and any other building subject to this Article 12C.

Water Budget Calculator: The water use calculation tool approved by the General Manager that provides for the assessment of a proposed onsite water system, Alternate Water Sources, and the end uses of the Alternate Water Source.

Water Budget Documentation: An in- depth assessment of the Project Applicant's non-potable water use, including survey information, water meter readings, water service billing information, Alternate Water Source schematic drawings, or any other information deemed necessary by the General Manager. For proposed District Systems, Water Budget Documentation shall include implementation information that, at a minimum, shall address potential infrastructure and public right of way conflicts, demonstrate compliance with all applicable requirements, and establish the capabilities of the Development Project Applicant to effectively operate the District System.

(Added as Sec. 851 by Ord. [195-12](#), File No. 120717, App. 9/17/2012, Eff. 10/17/2012; amended by Ord. [208-13](#), File No. 130765, App. 10/11/2013, Eff. 11/10/2013; redesignated and amended by Ord. [109-15](#), File No. 150350, App. 7/2/2015, Eff. 8/1/2015; amended by Ord. [246-16](#), File No. 161069, App. 12/16/2016, Eff. 1/15/2017; Ord. [155-21](#), File No. 210536, App. 10/8/2021, Eff. 11/8/2021; Ord. [19-25](#), File No. 240873, App. 3/4/2025, Eff. 4/4/2025)

SEC. 12C.3. APPLICABILITY

(a) This Article 12C shall apply to the installation and operation of the Alternate Water Source Systems at Large Development Projects, and to the voluntary installation and operation of the Alternate Water Source Systems at sites containing Multi-Family Residential Building and Non-Residential buildings. This Article does not apply to:

(1) Systems at Small Residential Buildings.

(2) Graywater systems where Graywater is collected solely for subsurface irrigation and does not require disinfection, as determined by the Director.

(3) Rainwater systems where Rainwater is collected solely for subsurface irrigation, drip irrigation, or non-sprinkled surface applications and does not require disinfection, as determined by the Director.

(b) Nothing in the ordinance in Board File No. 201536¹ amending this Article 12C is intended to impair or limit any contract right that exists as of the effective date of said ordinance. In connection with the application of Article 12C as it relates to development agreements or similar development contracts, or approved development plans administered by the Office of Community Investment and Infrastructure, the General Manager shall consult with the City Attorney to determine whether the application of this Article 12C to a specific Development Project will violate the terms of contracts that the City entered into before the aforementioned effective date.

(Added as Sec. 852 by Ord. [195-12](#), File No. 120717, App. 9/17/2012, Eff. 10/17/2012; redesignated and amended by Ord. [109-15](#), File No. 150350, App. 7/2/2015, Eff. 8/1/2015; amended by Ord. [155-21](#), File No. 210536, App. 10/8/2021, Eff. 11/8/2021)

CODIFICATION NOTE

- 1. So in Ord. [155-21](#).

SEC. 12C.4. DEVELOPMENT PROJECT REQUIREMENTS.

(a) Large Development Projects shall be constructed, operated, and maintained in compliance with the following:

(1) For Large Development Projects and District Development Projects that submit an application for a site permit on or prior to January 1, 2022, an Alternate Water Source System shall be constructed, operated, and maintained. All toilet and urinal flushing and irrigation demands shall be met through the collection and reuse of available onsite Rainwater, Graywater, and Foundation Drainage, to the extent required by application of the Water Budget Documentation developed for each Development Project.

(2) For Large Development Projects and District Development Projects consisting solely of Commercial Buildings that submit an application for a site permit after January 1, 2022, an Alternate Water Source System shall be constructed, operated, and maintained. Toilet and urinal flushing demands and drain trap priming are required non-potable uses. The collection and reuse of Blackwater and Condensate (required Alternate Water Sources) shall be used for required non-potable uses to the extent required by application of the Water Budget Documentation.

(3) For Large Development Projects and District Development Projects consisting solely of Multi-Family Residential Buildings or Mixed-Use Residential Buildings that submit an application for a site permit after January 1, 2022, an Alternate Water Source System shall be constructed, operated, and maintained. Toilet and urinal flushing, clothes washing, drain trap priming, and irrigation demands are required non-potable uses. The collection and reuse of Graywater and Condensate (required Alternate Water Sources) shall be used for required non-potable uses to the extent required by application of the Water Budget Documentation.

(4) For District Development Projects that consist of any combination of Commercial, Residential and Mixed-Use Residential Buildings, and that install a District System, toilet and urinal flushing, clothes washing, drain trap priming, and irrigation demands are required non-potable uses. The collection and reuse of Graywater

and Condensate (required Alternate Water Sources) shall be used for required non-potable uses to the extent required by application of the Water Budget Documentation.

(5) For District Development Projects that consist of any combination of Commercial, Residential and Mixed-Use Residential Buildings, and that install building-by-building Alternate Water Source Systems, the required non-potable uses and required Alternate Water Sources shall be the uses and sources for each category of building type describe in subsections (a)(2) and (a)(3) of this section.

(b) A Large Development Project Applicant shall use the Water Budget Calculator as follows:

(1) For Large Development Projects that submit an application for a site permit on or prior to January 1, 2022, a Large Development Project Applicant shall use the Water Budget Calculator, as provided by the General Manager's rules, to prepare a Water Budget assessing the amount of Rainwater, Graywater, and Foundation Drainage produced on site, and the planned toilet and urinal flushing and irrigation demands.

(2) For Large Development Projects that submit an application for a site permit after January 1, 2022, a Large Development Project Applicant shall use the Water Budget Calculator, as provided by the General Manager's rules, to prepare a Water Budget assessing the amount of Alternate Water produced on site by the required Alternate Water Sources, and the amount of Alternate Water needed to supply the required non-potable uses.

(c) (3)¹

(1) For Large Development Projects that submit an application for a site permit on or prior to January 1, 2022, if, based on the Water Budget Documentation, the available supply from onsite sources exceeds the demands for toilet and urinal flushing and irrigation, 100% of those demands shall be met by using the available onsite sources. If, based on the Water Budget Documentation, the available supply from onsite sources is less than the demands for toilet and urinal flushing and irrigation, 100% of the available onsite supply shall be used to meet the demands for toilet and urinal flushing and irrigation. Available Blackwater or Stormwater supplies may be used instead of, or in addition to Rainwater, Graywater, and Foundation Drainage to meet the available onsite supply requirements calculated in accordance with the Water Budget Documentation requirements of this section 12C.4(c)(1).

(2)(¹ For Large Development Projects that submit an application for a site permit after January 1, 2022, if, based on the Water Budget Documentation, the available supply from required Alternate Water Sources exceeds the demand from required non-potable uses, 100% of that demand shall be met by using the required Alternate Water Sources. If, based on the Water Budget Documentation, the available supply from required Alternate Water Sources is less than the demand from required non-potable uses, 100% of the available supply from required Alternate Water Sources shall be used to meet the demand from required non-potable uses.

(bd)¹ Small Development Project Applicants shall be as follows:

(1) For Small Development Projects that submit an application for a site permit on or prior to January 1, 2022, Small Development Project Applicants shall use the Water Budget Calculator, as provided by the General Manager's rules, to prepare a Water Budget assessing the amount of Rainwater, Graywater and Foundation Drainage produced on site, and the planned toilet and urinal flushing and irrigation demands.

(2) For Small Development Projects that submit an application for a site permit after January 1, 2022, Small Development Project Applicants shall use the Water Budget Calculator, as provided by the General Manager's rules, to prepare a Water Budget assessing the supply from Alternate Water Sources available on site, and the demand from non-potable uses on site.

(e) Large Development Projects and District Development Projects shall be subject to excess use charges for exceeding potable water allocations determined in accordance with rules adopted by the General Manager. If a Large Development Project or District Development Project exceeds its allocation of potable water, the Permittee for the Large Development Project or District Development Project shall be subject to excess use

charges on each unit of potable water exceeding the allocation at 300% (or 3x) the applicable water and wastewater rates.

(f) Large Development Projects and District Development Projects shall not provide Non-potable Water to water users or for purposes located outside the boundaries of the Large Development Project or District Development Project, except (1) as permitted in the sole discretion of the General Manager, or (2) when the water users or other purposes are located on property contiguous to, or across a public right of way from the boundaries of the Large Development Project or District Development Project, and the total amount of Non-potable Water produced by the Alternate Water Source System will not exceed 125% of the Large Development Project's or District Development Project's required non-potable demands as determined by the approved Water Budget Documentation.

(g) **Additional Requirements for District Systems.** All District Systems shall conform to the following requirements.: ¹

(1) In addition to preparation of the Water Budget, Project Applicants for District Systems shall submit implementation plans to the General Manager for review and approval, in accordance with guidelines and rules established by the General Manager.

(2) District Systems shall be constructed in accordance with all applicable City utility standards and specifications.

(3) Individual buildings within a District Development Project shall not be required to demonstrate compliance as long as the individual ¹ are provided service by an approved District System.

(h) The General Manager may approve Alternate District Systems that will achieve compliance with the purposes and objectives of this Article 12C, in accordance with guidelines and rules established by the General Manager. Alternative District Systems may include, but are not limited to, the dedication to the City, without cost to the City, of a District System's treatment and/or conveyance system that is constructed in accordance with all applicable utility standards and specifications.

(i) City departments shall not issue an encroachment permit, a site permit, or a plumbing permit for a Large Development Project or a Small Development Project, or approve a Non-potable Water Engineering Report, prior to the General Manager's determination that the Water Budget Documentation has been prepared in accordance with the General Manager's rules for Water Budget calculations.

(j) **Subdivision Approvals.**

(1) **Parcel Map or Tentative Subdivision Map Conditions.** The Director of Public Works shall not approve a tentative subdivision map or a parcel map for any property unless a condition is imposed requiring compliance with this Article 12C to serve the potential uses of the property covered by the parcel map or tentative subdivision map, as specified in the provisions of this Article.

(2) **Subdivision Regulations.** The Director of Public Works shall adopt regulations consistent with, and in furtherance of this Article 12C .

(3) **Final Maps.** The Director of Public Works shall not endorse and file a final map for property within the boundaries of the City without first determining that:

(A) The subdivider has complied with the conditions imposed on the tentative subdivision map or parcel map, pursuant to this Article 12C; and

(B) For any such conditions not fully satisfied prior to the recordation of the final map, the subdivider has signed a certificate of agreement and/or improvement agreement, to ensure compliance with such conditions.

(4) This subsection (j) shall not apply to tentative subdivision maps or parcel maps submitted solely for the purposes of condominium conversion, as defined in Subdivision Code Section 1308(d).

(g)¹ In the event that a privately owned Alternate Water Supply System approved by the General Manager is subsequently determined by the California Public Utilities Commission to be subject to that agency's jurisdiction and regulation, the San Francisco Public Utilities Commission may, with the consent of the affected owner, acquire and operate the facilities.

(Added by Ord. [109-15](#), File No. 150350, App. 7/2/2015, Eff. 8/1/2015; amended by Ord. [246-16](#), File No. 161069, App. 12/16/2016, Eff. 1/15/2017; Ord. [155-21](#), File No. 210536, App. 10/8/2021, Eff. 11/8/2021)

CODIFICATION NOTE

- 1. So in Ord. [155-21](#).

SEC. 12C.5. REGULATION OF ALTERNATE WATER SOURCES.

(a) Any person or entity who installs and operates an Alternate Water Source system shall comply with this Article 12C, the rules and regulations adopted by the Department of Public Health, and all applicable City, state, and federal laws.

(b) The Director shall issue rules and regulations regarding the operation of Alternate Water Source systems necessary to effectuate the purposes of this Article 12C and to protect public health and safety. These regulations shall address, at a minimum:

- (1) Water quality criteria;
- (2) Monitoring and reporting content and frequencies; and
- (3) Operation and maintenance requirements.

(c) The Director shall review applications for Alternative Water Sources systems and may issue or deny such applications, in accordance with applicable laws and regulations.

(d) The Department of Building Inspection shall review plans and issue or deny plumbing permits for the construction, installation, or modification of Alternate Water Source systems, in accordance with applicable laws and regulations.

(Added as Sec. 853 by Ord. [195-12](#), File No. 120717, App. 9/17/2012, Eff. 10/17/2012; redesignated and amended by Ord. [109-15](#), File No.

- 150350, App. 7/2/2015, Eff. 8/1/2015; amended by Ord. [155-21](#), File No. 210536, App. 10/8/2021, Eff. 11/8/2021)

SEC. 12C.6. PROJECT APPLICANT AND/OR PERMITTEE DESIGN AND CONSTRUCTION REQUIREMENTS.

(a) Prior to initiating installation of any Alternate Water Source project, Project Applicants shall submit to the Director an application for permits to operate Alternate Water Source systems. Such applications shall comply with the requirements of this Article 12C and any regulations the Director has issued. Project Applicants shall pay a non-refundable permit application fee to cover the costs of investigation and processing the application and issuing the permit. Each project application submitted to the Director shall include a Non-potable Water Engineering Report that provides project information the Director determines to be necessary for complete review of the proposed project. City departments may not approve or issue permits for any site installing an Alternate Water Source system unless and until the Director has approved the Non-potable Water Engineering Report.

The Non-potable Water Engineering Report for District systems must include information on the permanent legal agreements between property owners, and provide documentation that each party is a willing and responsible participant in the District Non-potable Water use.

(b) **System Design.** All buildings using Non-potable Water from Alternate Water Source systems shall include:

- (1) A flow meter on the non-potable distribution system to account for Non-potable Water use;
- (2) A flow meter on the potable make-up water pipeline to the Alternate Water Source System;
- (3) A reduced pressure backflow assembly (RP) within 25 feet of the downstream side of the point of connection or meter to protect the City's public water and/or recycled water system;
- (4) Signage that state law and the Department of Public Health's rules and regulations require;
- (5) Cross connection control in accordance with California Code of Regulations Titles 17 and 22 and the San Francisco Public Utilities Commission's Cross Connection Control Program; and
- (6) Any other requirements the Director determines are necessary to protect public health.

(c) **Plumbing Permit.** A Project Applicant shall obtain from the Department of Building Inspection an appropriate plumbing permit and any other building or installation permit required to construct, install, alter, an Alternate Water Source system. Each parcel within a District shall obtain appropriate plumbing and any other building or installation permits required.

(d) **Encroachment Permit.** A Project Applicant shall obtain from the Department of Public Works appropriate authorization for placement of any pipelines or other portions of an Alternate Water Source system within the public right-of-way.

(e) **Construction Certification Letter.** Project Applicants shall certify to the Director that Alternate Water Source system construction is complete and consistent with the approved Non-potable Water Engineering Report in accordance with the provisions of this Article 12C and any implementing rules and regulations. City departments may not approve or issue a First Certificate of Occupancy or approval for any Alternate Water Source system until the Director has reviewed and verified the Construction Certification Letter.

(Added as Sec. 854 by Ord. [195-12](#), File No. 120717, App. 9/17/2012, Eff. 10/17/2012; amended by Ord. [208-13](#), File No. 130765, App. 10/11/2013, Eff. 11/10/2013; redesignated and amended by Ord. [109-15](#), File No. 150350, App. 7/2/2015, Eff. 8/1/2015; amended by Ord. [155-21](#), File No. 210536, App. 10/8/2021, Eff. 11/8/2021)

SEC. 12C.7. FEES.

(a) The non-refundable application fees for alternative source water system permits are:

(1)	Rainwater, Stormwater, Foundation Drainage	\$2,616.28
(2)	Graywater	\$8,142.66
(3)	Blackwater	\$13,958.84
(4)	Transfer of any permit	\$226
(5)	District Scale, the applicable amount above, plus	\$226 per hour for plan review and/or on-site inspection.

(b) The fees set forth in this Section 12C.7 may be adjusted each year, without further action by the Board of Supervisors.

Not later than April 1, the Director shall report to the Controller the revenues generated by the fees for the prior fiscal year and the prior fiscal year's costs of operation, as well as any other information that the Controller determines appropriate to the performance of the duties set forth in this Section 12C.7.

Not later than May 15, the Controller shall determine whether the current fees produce, or are projected to produce, revenues sufficient to support the costs of providing the services for which the fees are assessed and that the fees will not produce revenue that significantly exceed more than the costs of providing the services for which the fees are assessed.

The Controller shall if necessary, adjust the fees upward or downward for the upcoming fiscal year as appropriate to ensure that the pro- gram recovers the costs of operation without producing revenue which is significantly more than such costs. The adjusted rates shall become operative on July 1.

(c) Every permit holder shall also pay an annual license fee as provided in the Business and Tax Regulations Code Section 249.24.

(Added as Sec. 855 by Ord. [195-12](#), File No. 120717, App. 9/17/2012, Eff. 10/17/2012; amended by Ord. [208-13](#), File No. 130765, App. 10/11/2013, Eff. 11/10/2013; redesignated and amended by Ord. [109-15](#), File No. 150350, App. 7/2/2015, Eff. 8/1/2015; amended by Ord. [155-21](#), File No. 210536, App. 10/8/2021, Eff. 11/8/2021)

SEC. 12C.8. OPERATING REQUIREMENTS.

When the Director determines the Project Applicant has satisfied all the requirements of this Article 12C, the Director may issue an operations permit for an Alternative Water Source system. Permittees shall timely submit all water quality monitoring information required by the provisions of this Article and the Department of Public Health's rules and regulations. Permittees shall conduct ongoing backflow prevention and cross connection testing in accordance with this Article, the rules and regulations of the Department of Public Health, and all applicable City, state, and federal laws.

(Added as Sec. 856 by Ord. [195-12](#), File No. 120717, App. 9/17/2012, Eff. 10/17/2012; redesignated and amended by Ord. [109-15](#), File No. 150350, App. 7/2/2015, Eff. 8/1/2015; amended by Ord. [155-21](#), File No. 210536, App. 10/8/2021, Eff. 11/8/2021)

SEC. 12C.9. NON-POTABLE WATER USE AUDITS.

When required by the General Manager, the Permittee shall conduct a Non-potable Water use audit describing the extent of Non-potable Water use in accordance with requirements provided by the General Manager.

(Added as Sec. 857 by Ord. [195-12](#), File No. 120717, App. 9/17/2012, Eff. 10/17/2012; redesignated and amended by Ord. [109-15](#), File No. 150350, App. 7/2/2015, Eff. 8/1/2015; amended by Ord. [155-21](#), File No. 210536, App. 10/8/2021, Eff. 11/8/2021)

SEC. 12C.10. SALE OR TRANSFER.

Permittees shall notify the Director of any intent to sell or transfer the building or facility containing an Alternate Water Source system within 30 days following the sale or transfer of property, in accordance with regulations adopted by the Director.

(Added as Sec. 858 by Ord. [195-12](#), File No. 120717, App. 9/17/2012, Eff. 10/17/2012; redesignated and amended by Ord. [109-15](#), File No. 150350, App. 7/2/2015, Eff. 8/1/2015; amended by Ord. [246-16](#), File No. 161069, App. 12/16/2016, Eff. 1/15/2017)

SEC. 12C.11. INSPECTION.

The Director may inspect any Alternate Water Source system subject to the requirements of this Article 12C to determine compliance with the provisions of this Article and applicable regulations.

(Added as Sec. 859 by Ord. [195-12](#), File No. 120717, App. 9/17/2012, Eff. 10/17/2012; redesignated and amended by Ord. [109-15](#), File No. 150350, App. 7/2/2015, Eff. 8/1/2015; amended by Ord. [155-21](#), File No. 210536, App. 10/8/2021, Eff. 11/8/2021)

SEC. 12C.12. VIOLATION AND PENALTIES.

Administrative penalties shall be assessed and collected by the Department of Public Health as set forth in this Section 12C.12.

(a) Any Permittee, or other person otherwise subject to the requirements of this Article 12C, who violates any provision of this Article or any applicable rule or regulation shall be subject to an administrative penalty imposed by order of the Director, not to exceed \$1,000. Each day or portion thereof that a violation exists constitutes a separate and distinct violation for which an administrative penalty may be imposed. In assessing the amount of the administrative penalty, the Director may consider any one or more of the following: the nature and seriousness of the misconduct, the number of violations, the persistence of the misconduct, the length of time over which the misconduct occurred, and the willfulness of the violator's misconduct.

(b) If the Director determines that any Permittee, or other person otherwise subject to the requirements of this Article 12C, is in violation of any provision of this Article or any applicable rule or regulation, the Director shall issue a Notice of Violation to the person. The Notice of Violation shall contain the following information: a description of circumstances or condition constituting the violation; the date by which the person must correct the violation; the amount of the administrative penalty that the Director will impose daily until such time as the person has demonstrated to the satisfaction of the Director that the violation has been corrected; and the right to seek administrative review of the Notice of Violation by filing an appeal within 30 days of the date that the Notice of Violation is served to challenge the Director's determination and/or the proposed administrative penalty.

(c) If no request for administrative review is timely made, the right to request a hearing shall be waived, and the Director's determination shall become final. The failure to timely request a hearing shall constitute a failure to exhaust administrative remedies and shall preclude judicial review of the validity of the enforcement action. The Director shall issue an order imposing the administrative penalties, which shall be due and payable within 15 days of the date of the order.

(d) Administrative penalties assessed by the Director shall be paid to the Treasurer of the City and County of San Francisco and credited to the Public Health Environmental Health Code Compliance Fund, authorized by Administrative Code Section 10.100-193.

(Added as Sec. 860 by Ord. [195-12](#), File No. 120717, App. 9/17/2012, Eff. 10/17/2012; redesignated and amended by Ord. [109-15](#), File No. 150350, App. 7/2/2015, Eff. 8/1/2015; amended by Ord. [155-21](#), File No. 210536, App. 10/8/2021, Eff. 11/8/2021)

SEC. 12C.13. REVOCATION AND SUSPENSION OF PERMIT.

The Director may order a Permittee to cease operation of an Alternate Water Source system, or may revoke or suspend the permit to operate if the Director determines that:

(a) The Permittee or its managers, operators or any employees has violated any provision of this Article 12C or any regulation issued pursuant to this Article;

(b) The Alternate Water Source system is being operated or maintained in a manner threatening the public health or health of patrons and/or residents; or

(c) The Permittee has refused to allow any duly authorized City official to inspect the premises or the operations of the Alternate Water Source system.

(Added as Sec. 861 by Ord. [195-12](#), File No. 120717, App. 9/17/2012, Eff. 10/17/2012; redesignated and amended by Ord. [109-15](#), File No. 150350, App. 7/2/2015, Eff. 8/1/2015; amended by Ord. [155-21](#), File No. 210536, App. 10/8/2021, Eff. 11/8/2021)

**SFPUC Regulations Governing Water Service to Customers,
Section G (Cross-Connection Control)**

Section G

Section G – Cross-Connection Control

(Section amended December 10, 2024, Resolution No. 24-0252)

Rule 1 - Applicability

- a) As a condition of receiving water service from the Public Water System, all Property Owners and Customers shall comply with this Section G of the SFPUC's Rules and Regulations Governing Water Service to Customers and any other applicable rule or legal requirement under San Francisco, state, or federal law. Section G's requirements also apply to Authorized Backflow Prevention Assembly Testers and Authorized Cross-Connection Control Specialists and the companies that employ them, as well as User Supervisors designated by Property Owners. Section G is promulgated in conformance with the California State Water Resources Control Board's standards for backflow protection and cross-connection control, implemented through the California Cross-Connection Control Policy Handbook (effective July 1, 2024); California Health and Safety Code Division 104, Part 12, Chapter 5, Article 2, section 116800; and San Francisco Health Code Article 12A.
- a) Property Owners and Customers shall properly install and ensure that an approved Backflow Preventer is in use at all times at the Water Service Connection in accordance with Section G's requirements if the Property or location at which they receive water service contains any of the following facilities, serves any of the following functions, or wherever any of the following conditions exists:
- i. Agricultural Property
 - ii. Airport
 - iii. Auxiliary Water supply
 - iv. Biotech facility
 - v. Business park with a single meter serving multiple businesses
 - vi. Buildings four stories or more in height or water supply greater than 40 feet above the water meter
 - vii. Car wash
 - viii. Cemetery
 - ix. Chemical plant
 - x. Dedicated irrigation service
 - xi. Dental office with water-connected equipment
 - xii. Dockside watering point or marine facility
 - xiii. Drinking water storage tank overflow connected to a sump or storm drain
 - xiv. Dry cleaner facility
 - xv. Dual-Plumbed Property
 - xvi. Electronics manufacture

Section G

- xvii. Fire protection systems
- xviii. Fire station
- xix. Gas station
- xx. Hazardous substances handled in any way the substances could enter the Public Water System
- xxi. Hotel/motel
- xxii. Industrial or commercial laundry facility
- xxiii. Incarceration facility (prison)
- xxiv. Intricate plumbing and piping arrangements
- xxv. Kidney dialysis facility
- xxvi. Laboratory
- xxvii. Medical facility/hospital/clinic
- xxviii. Metal-plating facility
- xxix. Mobile home park, recreational vehicle park, or campgrounds with recreational vehicle hookups
- xxx. Mortuary
- xxxi. Multiple standard Water Service Connections, at least one of which requires Backflow protection for Containment
- xxxii. Pet grooming
- xxxiii. Petroleum processing or storage plant
- xxxiv. Premises with irrigation system into which fertilizers, herbicides, or pesticides are or can be injected
- xxxv. Private water distribution main
- xxxvi. Radioactive material storage, processing plant, or nuclear reactor
- xxxvii. Railroad maintenance facility
- xxxviii. Repeated history of Cross-Connections being established or re-established
- xxxix. Restricted entry to a Property or parts of a Property so that Hazard Assessments cannot be made with sufficient frequency or at sufficiently short notice to ensure that Cross-Connections do not exist
- xl. Self-contained, self-cleaning public toilet
- xli. Sewage handling facility
- xl.ii. Solid waste disposal facility
- xl.iii. Temporary connections to existing water service line during construction (non- standard service).
- xliv. Temporary connection to hydrants for miscellaneous uses, including construction, street sweeping, and special events
- xl. v. Veterinarian facility
- xlvi. Wastewater lift stations and pumping stations
- xl. vii. Wastewater treatment processes, handling, or pumping equipment that is interconnected with a piping system connected to the Public Water System
- xl. viii. Water storage facility not under control of the Public Water System
- xl. ix. Unabated internal Cross-Connection
 - I. Any other On-Site Hazard that the General Manager identifies as requiring abatement for the protection of the Public Water System

Section G

Rule 2 - Definitions

The terms used in this section have the following meanings.

- a) **Applicant:** A Person who seeks to obtain a Permit to Operate under San Francisco Health Code Article 12A and these Rules and Regulations.
- b) **Air Gap Separation (AG):** A physical vertical separation of at least two times the effective pipe diameter between the free-flowing discharge end of a potable water supply pipeline and the flood level of an open or non-pressurized receiving vessel, which is in no case less than 1 inch.
- c) **Approved Water Supply:** A water source that the State Water Resources Control Board has approved for domestic use in a Public Water System and is designated as such in a domestic water supply permit issued pursuant to California Health and Safety Code §116525.
- d) **Authorized Backflow Prevention Assembly Tester:** A Person who possesses a valid certification to test Backflow Prevention Assemblies and to inspect Air Gap Separations and is authorized by the General Manager to do such work in accordance with San Francisco Health Code Article 12A and these Rules and Regulations.
- e) **Authorized Cross-Connection Control Specialist:** A Person who possesses a valid certification to conduct Hazard Assessments and is authorized by the General Manager to do such work in accordance with San Francisco Health Code Article 12A and these Rules and Regulations.
- f) **Authorized Representative:** A Person designated by a company employing Authorized Backflow Prevention Assembly Testers or Authorized Cross-Connection Control Specialists to obtain Backflow Tags on behalf of the company.
- g) **Auxiliary Water:** Any water other than that from an Approved Water Supply. This category of water includes, but is not limited to, municipally supplied recycled water, wastewater, graywater, groundwater, rainwater, foundation drainage, black water, and alternate water sources as defined in San Francisco Health Code Article 12C and accompanying rules and regulations.
- h) **Backflow:** An undesired or unintended reversal of flow of water and/or other liquids, gases, or other substances into a Public Water System's distribution system or Approved Water Supply.
- i) **Backflow Preventer:** A Backflow Prevention Assembly or an Air Gap Separation.
- j) **Backflow Prevention Assembly:** A mechanical assembly designed and constructed to prevent Backflow, such that while in-line, it can be maintained and its ability to prevent Backflow, as designed, can be field tested, inspected, and evaluated.
- k) **Backflow Tag:** The tag provided by the General Manager that an Authorized Backflow Prevention Assembly Tester or Authorized Cross-Connection Control Specialist shall affix to a Backflow Preventer after it has been inspected and passed testing in accordance with San Francisco Health Code Article 12A and these Rules and Regulations.

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- l) Citation:** A written citation issued by the General Manager to a Person that describes the facts and events that are the basis of the Person's violation(s) of San Francisco Health Code Article 12A and these Rules and Regulations, through which the General Manager may enforce Article 12A and these Rules and Regulations.
- m) City:** The City and County of San Francisco.
- n) Containment:** Protection of the Public Water System's distribution system from Backflow from a Property through the installation of one or more Backflow Preventers, installed as close as practical to the Property's Water Service Connection, in a manner that isolates the Property from the Public Water System's distribution system.
- o) Cross-Connection:** Any actual or potential connection or structural arrangement between (1) the Public Water System, including a piping system connected to the Public Water System and located on a Property or available to the Property Owner, and
(2) any source or distribution system containing liquid, gas, or other substances not from an Approved Water Supply.
- p) Cross-Connection Test:** A test supervised by an Authorized Cross-Connection Control Specialist to verify that no Cross-Connections exist between the potable water piping and any Auxiliary Water piping system.
- q) Customer:** The Person that receives water service from the SFPUC at a Property and is listed as the customer of record for the Property in the SFPUC Customer Service Bureau database. The Customer may be the Property Owner or the Property Owner's agent.
- r) Double-Check Detector Backflow Prevention Assembly (DCDA):** A DC that includes a bypass with a water meter and DC, with the bypass's water meter accurately registering flow rates up to two gallons per minute and visually showing a registration for all rates of flow.
- s) Double-Check Detector Backflow Prevention Assembly Type II (DCDA-II):** A DC that includes a bypass around the second check, with the bypass having a single check valve and a water meter accurately registering flow rates up to two gallons per minute and visually showing a registration for all rates of flow.
- t) Double-Check Valve Backflow Prevention Assembly (DC):** A Backflow Prevention Assembly consisting of two independently acting, internally loaded check valves, with tightly closing shutoff valves located at each end of the assembly (upstream and downstream of the two check valves) and fitted with test cocks that enable accurate field testing of the assembly.
- u) Dual-Plumbed System:** A plumbing system that utilizes separate piping systems for Auxiliary Water and potable water within a Property.
- v) General Manager:** The General Manager of the SFPUC, or any SFPUC employee or City agency designated by the General Manager to act on the General Manager's behalf. The Water Quality Division Director is designated to act for the General Manager in relation to this Section G of these Rules and Regulations.

Section G

- w) **Hazard Assessment:** An assessment by an Authorized Cross-Connection Control Specialist to evaluate the types and degrees of hazard on a Property.
- x) **High-Hazard Cross-Connection:** A Cross-Connection that poses a threat to the potability or safety of the Public Water System. Materials entering the Public Water System through a High-Hazard Cross-Connection are contaminants, or health hazards.
- y) **License Fee:** A license fee paid annually to the San Francisco Tax Collector as provided in the San Francisco Business and Tax Regulations Code, Section 249.14.
- z) **Low-Hazard Cross-Connection:** A Cross-Connection that does not pose a threat to the potability or safety of the Public Water System but may adversely affect the aesthetic quality of the Potable Water System. Materials entering the Public Water System through a Low-Hazard Cross-Connection are pollutants, or non-health hazards.
- aa) **On-Site Hazard:** Any actual or potential hazard to the Public Water System that may be created as a result of conditions existing on a Property.
- bb) **Permit to Operate:** A permit issued by the General Manager to a Person to work as an Authorized Backflow Prevention Assembly Tester or as an Authorized Cross-Connection Control Specialist in accordance with San Francisco Health Code Article 12A and these Rules and Regulations.
- cc) **Permittee:** A Person that receives a Permit to Operate from the General Manager in accordance with San Francisco Health Code Article 12A and these Rules and Regulations.
- dd) **Person:** Any individual, company, corporation, firm, partnership, association, organization, or government entity, including local, state and federal governments.
- ee) **Point of Connection:** A Customer's water meter for all SFPUC-provided water services, except for dedicated fire services, for which the Point of Connection is the junction of the SFPUC water supply lateral and the Customer's fire protection system.
- ff) **Property:** Any parcel, premises, building, or other structure that receives potable water service from the Public Water System.
- gg) **Property Owner:** The legal owner of a Property or the agent of the legal owner of a Property.
- hh) **Public Water System (PWS):** A potable water system as defined in California Health and Safety Code §116275(h). For the purposes of these Rules and Regulations, the term Public Water System refers to the potable water system operated and maintained by the SFPUC.
- ii) **Recycled Water:** Wastewater that, as a result of treatment, is suitable for uses other than potable uses.

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- jj) Reduced Pressure Principle Backflow Prevention Assembly (RP):** A Backflow Prevention Assembly with two independently acting, internally loaded check valves, with a hydraulically operating, mechanically independent differential-pressure relief valve located between the check valves and below the upstream check valve. The assembly shall have shutoff valves, located upstream and downstream of the two check valves, and test cocks to enable accurate field testing of the assembly.
- kk) Reduced Pressure Principle Detector Assembly (RPDA):** An RP that includes a bypass with a water meter and RP, with the bypass's water meter accurately registering flow rates up to two gallons per minute and visually showing a registration for all rates of flow.
- ll) Reduced Pressure Principle Detector Assembly Type II (RPDA-II):** An RP that includes a bypass around the second check, with the bypass having a single check valve and a water meter accurately registering flow rates up to two gallons per minute and visually showing a registration for all rates of flow.
- mm) Rules and Regulations:** The SFPUC Rules and Regulations Governing Water Service to Customers, including but not limited to this Section G, Cross-Connection Control, as may be amended from time to time.
- nn) SFPUC:** The San Francisco Public Utilities Commission as an operating department of the City and County of San Francisco.
- oo) Swivel-ell:** An RP combined with a changeover piping configuration (also known as a swivel-ell connection) that is designed and constructed pursuant to the California Cross-Connection Control Policy Handbook.
- pp) User Supervisor:** A Person designated by a Property Owner to oversee a Property and be responsible for the avoidance of Cross-Connections. This term includes site supervisors in charge of Properties with municipally supplied Recycled Water or Auxiliary Water systems.
- qq) Water Quality Division:** The SFPUC Water Quality Division.
- rr) Water Service Connection:** A Property's connection to the Public Water System.

Rule 3 - Type and Level of Backflow Prevention Required

- a) Property Owners shall only install Backflow Preventers and associated pipe, fittings, solder, and flux that are "lead-free," as defined in the California Health and Safety Code §116875.
- b) Property Owners shall only install Backflow Prevention Assemblies that are (1) on the "List of Approved Backflow Prevention Assemblies" maintained by the University of Southern California Foundation for Cross-Connection Control and Hydraulic Research or (2) certified by a comparable organization approved by the General Manager.

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- c) Property Owners shall only install Air Gap Separations that meet the requirements set forth in the San Francisco Plumbing Code, Chapter 6, section 603.3.1.
- d) For Containment at permanent Water Service Connections, Property Owners shall install one the following types of Backflow Preventers, listed in increasing level of protection: (1) a Double-Check Valve Backflow Prevention Assembly (DC), (2) a Reduced Pressure Principle Backflow Prevention Assembly (RP), or (3) an Air Gap Separation (AG). For Containment at temporary connections to the Public Water System, the required level of protection is an RP, AG, or spring-loaded check valve (San Francisco Fire Department only).
 - i. The type of Backflow Preventer installed and in use shall meet at least the minimum level of protection for the applicable hazard at the Property that is identified in Table 1 below. A DC may only be used to protect against Low-Hazard Cross-Connections. An RP or AG is required to protect against High-Hazard Cross-Connections. On fire services, a DCDA/DCDA-II or RPDA/RPDA-II is required in lieu of a DC or RP, respectively.
 - ii. If Table 1 identifies two types of Backflow Preventers as the required level of protection for the same hazard criterion, or does not specify the type, the General Manager shall determine through a Hazard Assessment which is required for the particular hazard criterion.
 - iii. If more than one hazard criterion applies to a Property, the hazard criterion requiring the greatest level of protection in Table 1 shall apply.
 - iv. If the General Manager is unable to assess a Property to determine the type of hazard(s) present, the Property Owner shall install an RP at the Point of Connection to the Public Water System.
- e) For isolation of a hazard within a Property, Property Owners shall install a Backflow Preventer that meets the minimum level of protection required in Chapter 6 of the California Plumbing Code, unless one or more of the hazard criteria identified in Table 2 applies to the Property, requiring that the Property Owner install an RP or AG.

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- f) For Containment protection at Properties that may temporarily switch between municipally supplied Recycled Water and potable water from the Public Water System: A Property Owner may install a Swivel-ell for Containment, in lieu of an Air Gap Separation, as long as the following conditions are met.
- i. Property Owners shall only install Swivel-ells that are approved by the State Water Resources Control Board and adhere to the design and construction-related requirements in the California Cross-Connection Control Policy Handbook.
- ii. Property Owners that install Swivel-ells shall:
- Enter into a legally binding agreement with the SFPUC Water Quality Division regarding the installation and use of the Swivel-ells.
 - Notify the Water Quality Division at least 24 hours before all switchovers to or from potable water and provide an estimate of the timeframe until the next switchover.
 - Ensure that a Water Quality Division Water Service Inspector who is a Cross- Connection Control Specialist is present at each switchover.
 - Have the Swivel-ell RP tested by an Authorized Backflow Prevention Assembly Tester within 72 hours of each switchover to potable water use and at least every 12 weeks the Property is supplied with potable water, with a visual inspection of the RP immediately upon each switchover to potable water use. Documentation of the tests shall be submitted to the Water Quality Division within five business days of each test.
 - Inspect the Swivel-ell at least every 12 months and provide documentation to the Water Quality Division within five business days of the inspection that confirms ongoing compliance with the design and construction-related requirements in the California Cross-Connection Control Policy Handbook.

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Table 1: Hazard Criteria and Required Backflow Protection for Containment

Attention: See footnotes for important information.

Hazard Criteria	Required Level of Protection
Hazardous Substances/Wastewater	
- Hazardous substances handled in any way the substances could enter the Public Water System - Mobile home park, recreational vehicle park, or campgrounds with recreational vehicle hookups - Self-contained, self-cleaning public toilet - Sewage handling facility	AG or RP ¹
Hazard Criteria	
- Wastewater lift stations and pumping stations - Wastewater treatment processes, handling, or pumping equipment that is interconnected to a piping system connected to the Public Water System	
Medical/Laboratory/Research	
- Biotech facility - Dental office with water-connected equipment - Kidney dialysis facility - Laboratory - Medical facility/hospital/clinic - Mortuary - Veterinarian facility	AG or RP ¹
Manufacturing/Processing/Storage	
- Chemical plant - Electronics manufacture - Metal-plating facility - Petroleum processing or storage plant - Radioactive material storage, processing plant, or nuclear reactor	AG or RP ¹
Commercial	
- Business park with a single meter serving multiple businesses - Car wash - Dry cleaner facility - Gas station - Hotel/motel - Industrial or commercial laundry facility - Pet grooming	AG or RP ¹

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Hazard Criteria	Required Level of Protection
Irrigation Systems	
• Cemetery • Dedicated irrigation service • Premises with irrigation system into which fertilizers, herbicides, or pesticides are or can be injected	RP
Water Storage Tanks	
• Drinking water storage tank overflow connected to a sump or storm drain • Water storage facility not under control of the PWS	AG
Other	
• Agricultural premises • Airport • Auxiliary Water supply • Dual-Plumbed Property • Dockside watering point or marine facility • Fire station • Incarceration facility (prison) • Private water distribution main • Railroad maintenance facility • Solid waste disposal facility	AG or RP ¹
Miscellaneous Conditions	
• Intricate plumbing and piping arrangements³ • Repeated history of Cross-Connections being established or re-established² • Restricted entry to a Property or parts of a Property such that Hazard Assessments cannot be made with sufficient frequency or at sufficiently short notice to assure that Cross-Connections do not exist • Unabated internal Cross-Connections • Any other On-Site Hazard that the General Manager identifies as requiring abatement for the protection of the Public Water System	AG or RP ¹
Properties with Multiple Service Connections to the PWS	
Properties with multiple service connections, excluding fire services, at least one of which requires Backflow protection for Containment	Varies ³
Buildings 4 or More Stories High or Water Supply Over 40 Feet Above Water Meter	
Buildings 4 stories or more in height or water supply greater than 40 feet above the water meter	DC

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Hazard Criteria	Required Level of Protection
Fire Protection Systems	
Properties where the fire protection system is supplied from the PWS and interconnected with an onsite Auxiliary Water supply	AG
Properties where the fire protection system is supplied from the PWS with no interconnections with Auxiliary Water supplies	DCDA or DCDA-II
Properties where chemicals can be injected into the fire system	RPDA or RPDA-II
Properties under the jurisdiction of the San Francisco Port Authority	RPDA or RPDA-II
Construction/Miscellaneous Hydrant Use	
- Temporary connections to hydrants for miscellaneous uses, including construction and special events⁴ - Temporary connection to existing water service line during construction (non-standard service)	RP ⁴
Temporary connections to hydrants for filling water tanks on vehicles, such as for street sweeping	RP or AG ⁴
Temporary Connections to Hydrants for Firefighting	
Fire trucks that are connected to low-pressure hydrants shall not be connected at the same time to any high-pressure hydrants that are a part of the San Francisco Auxiliary Water Supply System, also known as the San Francisco Emergency Firefighting System	Spring-loaded check valve ⁵

Notes for Table 1:

¹ The General Manager will determine the required level of protection based upon a Hazard Assessment.

² In addition to the required level of protection for the identified hazard criterion, the General Manager may also require the Property Owner to designate a User Supervisor, and the Property Owner and User Supervisor shall comply with the requirements of Rule 12.

³ All service connections, excluding fire services, must have at least the same level of protection, which must address the highest degree of hazard on the Property. For example, if one connection requires an RP, then every connection must have an RP.

⁴ All Customer plumbing must be downstream of the SFPUC-issued meter and RP that Customers are required at all times to use when accessing temporary water supply through low-pressured hydrants, in accordance with all SFPUC rules and regulations.

⁵ The State Water Resources Control Board approved the use of spring-loaded check valves on hydrants during firefighting in Compliance Order 02-04-95CO-006. The order requires a Water Quality Division Water Service Inspector who is also a Cross-Connection Control Specialist to respond to all two-alarm and higher fires to check for Cross-Connections between the Public Water System and the San Francisco Auxiliary Water Supply System, also known as the Emergency Firefighting Water System.

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Table 2: Hazard Criteria and Required Backflow Protection for Isolation of Hazards within a Property

Hazard Criteria	Required Level of Protection
Auxiliary Water storage tank with potable water makeup supply	AG
Irrigation systems into which fertilizers, herbicides, or pesticides are or can be injected	RP
Carbonators in systems with upstream copper pipe	RP
Industrial water chillers	RP
Sewage and hazardous or potentially hazardous substances: at the connection of potable water piping within a facility to a system conveying a fluid that is not potable	AG

Rule 4 - Installation, Replacement, and Relocation Requirements for Backflow Preventers

- a) No Person shall install, replace, or relocate a Backflow Preventer without a valid permit from the City's Department of Building Inspection, Plumbing Inspection Division, unless the Property at which the Backflow Preventer is to be installed, replaced, or relocated is under the jurisdiction of the Port of San Francisco, California Department of Health Care Access and Information, California Office of the State Fire Marshal, or federal government. In the latter case, a permit must be obtained from the authority having jurisdiction.
- b) Property Owners shall install Backflow Preventers for Containment as close as practical but in any case within 25 feet of the downstream side of the Point of Connection to the Public Water System. If any part of a service line extends over bay or ocean waters, the Property Owner shall install a Backflow Prevention Assembly upstream of the seawall and within 25 feet of the Point of Connection.
- c) No Person shall make any connection between the Point of Connection and a Backflow Preventer for Containment. Similarly, no appurtenances shall be installed between the Point of Connection and a Backflow Preventer for Containment, except that a Y strainer may be attached directly upstream of the number 1 shutoff valve of a Backflow Prevention Assembly as long as (1) no connections are made to the Y strainer, (2) the Y strainer is protected from tampering, and (3) the Y strainer is inspected at least annually by an Authorized Backflow Prevention Assembly Tester.
- d) Property Owners shall install Backflow Prevention Assemblies in the orientation intended by the manufacturer and approved by the University of Southern California Foundation for Cross-Connection Control and Hydraulic Research or comparable organization approved by the General Manager. No modifications may be made to the approved assembly configuration, except that flanged shutoff valves 2.5 inches or larger may be rotated by one bolt hole.

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- e) All Backflow Preventers shall be accessible for field testing, inspection, and maintenance after installation. If a Backflow Preventer is installed in an enclosure, the enclosure shall be large enough or removable to allow for testing and maintenance.
- f) Backflow Preventers shall not be installed below grade in pits, vaults, or confined spaces. DCs, DCDAs, DCDA-IIs, RPs, RPDAs, and RPDA-IIs shall be a minimum of 12 inches and a maximum of 36 inches above grade as measured from the bottom of the assembly.
- g) DCs, DCDAs, DCDA-IIs, RPs, RPDAs, and RPDA-IIs shall have clearances of at least 12 inches on all sides. On the side of the assembly that contains the test cocks, a side clearance of at least 24 inches is required.
- h) Backflow Prevention Assemblies shall be installed so that the make and serial number are visible in a readily accessible location. These identifiers shall not be painted over or otherwise made illegible.
- i) When an RP, RPDA, or RPDA-II is installed indoors, drainage shall also be installed to prevent flooding.
- j) Air Gap Separations used for Containment shall meet the following requirements:
 - i. The receiving water container shall be located on the Property at the Water Service Connection, unless the General Manager approves an alternate location.
 - ii. The Air Gap Separation shall be located outside of the receiving water container.
 - iii. All piping between the Water Service Connection and the discharge location at the receiving water container shall be above finished grade and be accessible for visual inspection, unless the General Manager approves an alternative piping configuration.
 - iv. All new installations of Air Gap Separations at Water Service Connections shall be reviewed and approved by the State Water Board before installation.

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Rule 5 - Testing, Inspection, and Repair Requirements for Backflow Preventers

- a) All testing, inspections, and repairs of Backflow Preventers shall be conducted at the sole expense of the Property Owner.
- b) Property Owners shall ensure that their Backflow Preventers are inspected and/or tested at least annually and are in proper working order.
- c) Backflow Prevention Assemblies:
 - i. All Backflow Prevention Assemblies shall be tested by an Authorized Backflow Prevention Assembly Tester following installation, repair, depressurizing for winterizing, or permanent re-location, and at least annually thereafter. The General Manager may also require more frequent testing if determined to be necessary. Property Owners shall comply with all such testing requirements.
 - ii. Any Backflow Prevention Assembly that fails a field test shall be repaired or replaced within 30 days of notification of the failure and immediately retested before being placed into service. If a Backflow Prevention Assembly cannot be repaired or otherwise made functional on the same day as the initial field test, the Authorized Backflow Prevention Assembly Tester shall report the test data to the Water Quality Division by the close of business on that same day. The General Manager may allow an extension of the 30-day requirement for repair or replacement in this paragraph at the General Manager's sole discretion.
 - iii. Authorized Backflow Prevention Assembly Testers shall notify the Water Quality Division if a Backflow Prevention Assembly has been modified from the approved orientation provided in Rule 4(d).
- d) Air Gap Separations:
 - i. All Air Gap Separations shall be visually inspected by an Authorized Backflow Prevention Assembly Tester or Authorized Cross-Connection Control Specialist at least annually. The General Manager may require more frequent inspections if determined to be necessary. Property Owners shall comply with all such requirements.
 - ii. If an inspection reveals that an Air Gap Separation is not in compliance with the requirements of Chapter 6 of the California Plumbing Code, the Authorized Backflow Prevention Assembly Tester or Authorized Cross-Connection Control Specialist that conducted the inspection shall report the deficiency to the Water Quality Division by the close of business on that same day.

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- iii. The Property Owner shall have an Air Gap Separation inspected and repaired when notified by the General Manager to do so.
- e) After a Backflow Preventer has passed a test/inspection, the Authorized Backflow Prevention Assembly Tester or Authorized Cross-Connection Control Specialist (Air Gap Separations only) shall affix a Backflow Tag to it.

Rule 6 - Backflow Prevention Assembly Test Tags

- a) Backflow Tags may only be obtained from the SFPUC by Authorized Backflow Prevention Assembly Testers, Authorized Cross-Connection Control Specialists, and Authorized Representatives.
- b) Backflow Tags may be purchased in person at the SFPUC Customer Service Bureau or by mail. The form for purchases by mail is available at sfpuc.gov/backflow.
- c) The cost of Backflow Tags is set forth in the SFPUC's Rate Schedules & Fees for Water and Sewer Service, Schedule W-45, which is available on the SFPUC website and is subject to change at the beginning of each fiscal year (July 1 to June 30).

Rule 7 - Water Quality Division Inspections of New Water Services

- a) All new water services that require a Backflow Preventer at the Water Service Connection to the Public Water System under San Francisco Health Code Article 12A and these Rules and Regulations must receive and pass an initial and final inspection by the Water Quality Division. The Property Owner shall call the Water Quality Division at (650) 652-3199 to schedule these inspections in the timeframes specified in (b) and (c) below. These inspections are separate from those required by other City departments for other purposes.
- b) An initial inspection is required after the installation of a Backflow Preventer at the Water Service Connection to the Public Water System. The SFPUC will not provide a water service line and meter until the Backflow Preventer has passed the initial inspection.
- c) A final inspection is required within 48 hours of the start of receiving water service. If this inspection is not conducted within this timeframe, water service will be turned off and will not be restored until the final inspection has been passed.
- d) The fee for the Water Quality Division's inspections is set forth in the SFPUC's Rate Schedules & Fees for Water and Sewer Service, Schedule W-41A, which is available on the SFPUC website and is subject to change at the beginning of each fiscal year.

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Rule 8 - Permits to Operate

- a) A valid Permit to Operate as an Authorized Backflow Prevention Assembly Tester is required at all times for any Person to test Backflow Prevention Assemblies at a Property.
- b) A valid Permit to Operate as an Authorized Cross-Connection Control Specialist is required at all times for any Person to conduct Hazard Assessments and Cross-Connection Tests at a Property.
- c) A Person may apply for a Permit to Operate as either an Authorized Backflow Prevention Assembly Tester or an Authorized Cross-Connection Control Specialist. A Person that seeks a Permit to Operate as both a tester and a specialist shall submit two separate applications for two separate Permits to Operate.
- d) Application Process: To apply for a Permit to Operate, an Applicant shall:
 - i. Submit a completed application form and application fee as instructed on the SFPUC's website at sfpuc.gov/backflow.
 - ii. Provide a copy of the Applicant's current certification as a backflow prevention assembly tester or a cross-connection control specialist, as applicable, from one of the following organizations:
 - American Society of Sanitary Engineers
 - California-Nevada section of the American Water Works Association
 - Other organization approved by the General Manager
 - iii. Provide proof of use of a calibrated test kit (Authorized Cross-Connection Control Testers only).
 - iv. Provide the Applicant's certificate of general liability insurance in full force and effect, at the Applicant's expense, for all activities to be performed under the Permit to Operate, unless the Applicant is a City employee. Such insurance shall include coverage for bodily injury, personal injury, including death resulting therefrom, and property damage (including water damage) insurance, with limits not less than \$2 million each occurrence combined single limit. The City, its officers, and employees shall be named as additional insureds under the policy, and a cross-liability clause shall be attached. Such insurance shall provide 10-day prior written notice of cancellation, non-renewal, or material change to the General Manager.
 - v. Complete a written examination administered by the General Manager with a passing grade of at least 70 percent.

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- e) **Permit Approval and Issuance:** The decision whether to approve or deny any application for a Permit to Operate shall be at the sole and absolute discretion of the General Manager. Upon approval, Applicant information is forwarded to the City's Office of the Treasurer and Tax Collector, which will accept the Applicant's payment of the License Fee. The Permit to Operate is issued upon the Applicant's payment of the License Fee.
- f) **Maintaining a Permit to Operate:** The duration of a Permit to Operate is one year. To maintain a Permit to Operate in good standing, the Permittee shall:
 - i. Maintain a current certificate of competency and current general liability insurance meeting the requirements of these Rules and Regulations. If an Authorized Backflow Prevention Assembly Tester, the Permittee shall also maintain proof of use of a calibrated test kit.
 - ii. Notify the Water Quality Division within 24 hours of becoming aware of either of the following conditions:
 - The Permittee's certificate of competency has expired or been revoked.
 - The Permittee's general liability insurance has been cancelled, not renewed, or changed materially.
 - iii. Maintain all documentation required under these Rules and Regulations and any other local or state law or regulation and make all such documentation available for inspection at the request of the General Manager.
 - iv. Attend the Water Quality Division's Annual Meeting for Authorized Backflow Prevention Assembly Testers or complete alternative annual training provided by the Water Quality Division.
 - v. Comply with all other requirements of these Rules and Regulations, San Francisco Health Code Article 12A, and any other applicable rule or legal requirement under local, state, or federal law.
 - vi. Follow all procedures in the Water Quality Division's Instructions for Authorized Backflow Prevention Assembly Testers and Instructions for Authorized Cross- Connection Control Specialists, which are available on the SFPUC's website at sfpuc.gov/backflow and may be periodically updated to reflect current policies and procedures.

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- g) Annual Renewal: To annually renew a Permit to Operate, the Permittee shall:
- i. Have a Permit to Operate in good standing.
 - ii. Pay the License Fee to the City's Office of the Treasurer and Tax Collector before the current expiration date of the Permit to Operate.
 - iii. Provide to the General Manager before the current expiration date of the Permit to Operate:
 - A copy of the Permittee's renewed certificate of competency, if the previous certificate has expired.
 - A certificate of general liability insurance in full force and effect meeting the requirements of Rule 8(d)(iv).
 - Proof of use of a calibrated test kit (Authorized Cross-Connection Control Testers only).
- h) No Transfer: Permits to Operate are issued to individual persons and are not transferable. If a Permittee ceases to work for an employer that held the Permittee's certificate of liability insurance, the Permittee shall submit to the General Manager within five business days valid evidence of liability insurance, as described in Rule 8(d)(iv) above, to maintain a valid Permit to Operate.
- i) Suspension and Revocation of Permits to Operate:
- i. The General Manager may suspend or revoke any Permit to Operate upon a determination that the Permittee has failed to meet any of the requirements in this Rule 8; has violated any other requirement of these Rules and Regulations or San Francisco Health Code Article 12A; has engaged in conduct in connection with activities covered by the Permit to Operate that violates other local, state, or federal laws; or has made a material misrepresentation when applying for a Permit to Operate.

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- ii. Before the suspension or revocation of any Permit to Operate, the General Manager will issue a written notice to the Permittee at the Permittee's address on record specifying the reason why the General Manager intends to suspend or revoke the Permit to Operate and provide the Permittee with an opportunity to challenge the suspension or revocation in accordance with the administrative review procedure outlined in Rule 15. Notwithstanding the foregoing, the General Manager may immediately suspend any Permit to Operate pending a noticed hearing on suspension or revocation when, in the opinion of the General Manager, the public health or safety requires such immediate suspension. The General Manager will issue written notice of such immediate suspension to the Permittee in person or by registered letter to the Permittee's address on record.
- j) Appeals: The final decision of the General Manager to grant, deny, suspend, or revoke a Permit to Operate in accordance with these Rules and Regulations may be appealed to the San Francisco Board of Appeals in the manner prescribed in San Francisco Business and Tax Regulations Code Article 1.

Rule 9 - Companies Employing Authorized Backflow Prevention Assembly Testers and Authorized Cross-Connection Control Specialists

- a) Companies that employ Authorized Backflow Prevention Assembly Testers and Authorized Cross-Connection Control Specialists shall register with the General Manager as instructed on the SFPUC's website at sfpuc.gov/backflow. Companies must provide a business name, contact phone number and email address, website, and proof of liability insurance meeting the requirements of Rule 8(d)(iv).
- b) Companies shall maintain general liability insurance in full force and effect, at company expense, for all activities performed by the Authorized Backflow Prevention Assembly Testers and Authorized Cross-Connection Control Specialists that they employ. Such insurance shall include coverage for bodily injury, personal injury, including death resulting therefrom, and property damage (including water damage) insurance, with limits not less than \$2 million each occurrence combined single limit. The City, its officers, and employees shall be named as additional insureds under the policy, and a cross-liability clause must be attached. The insurance shall provide 10-day prior written notice of cancellation, non-renewal, or material change to the General Manager.
- c) Companies shall provide the names of the Authorized Backflow Prevention Assembly Testers and Authorized Cross-Connection Control Specialists that they employ at the time of registration. Companies shall notify the General Manager by email within five business days of a tester or specialist's first or last day of employment.

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- d) Companies may designate up to two people to act as Authorized Representatives for the purchase of Backflow Tags on behalf of the company. Companies shall provide written notice to the General Manager of the names of those authorized as well as written notice of any changes in designation when they occur.
- e) Companies shall maintain continuous records of all activities that they and the Authorized Backflow Prevention Assembly Testers and Authorized Cross-Connection Control Specialists that they employ perform in relation to Backflow prevention for a period of three years. These records shall include the dates and locations of all tests, repairs, and inspections of Backflow Preventers; Hazard Assessments and Cross-Connection Tests; and the names of the individuals who performed them. Companies shall make these records available to the General Manager within five business days of the General Manager's request.

Rule 10 - Inspection and Testing Requirements for Dual-Plumbed Systems

- a) All inspections, testing, and repairs of Dual-Plumbed Systems shall be conducted at the sole expense of the Property Owner.
- b) Before being put into service, all Dual-Plumbed Systems shall pass an initial inspection and Cross-Connection Test supervised by an Authorized Cross-Connection Control Specialist in the presence of a representative of the Water Quality Division. The initial Cross-Connection Test shall be a shutdown test.
- c) After the initial inspection and Cross-Connection Test, Property Owners shall conduct Cross-Connection Tests of Dual-Plumbed Systems with the frequency set forth in Table 3 below. Subsequent Cross-Connection Tests shall be shutdown tests, unless a Property Owner submits a request in writing to the General Manager to conduct a pressure differential test in lieu of a shutdown test, and the General Manager approves the request, at the General Manager's sole discretion. Property Owners shall also conduct additional inspections and Cross-Connection Tests under the following circumstances:
 - i. Whenever directed by the General Manager to do so.
 - ii. Whenever there is material reason to believe that the separation between the Property's potable and non-potable systems has been compromised, for example, based on a visual inspection or following water quality complaints.
 - iii. Immediately after remediation of a discovered Cross-Connection.

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Table 3: Inspection and Testing Requirements for Dual-Plumbed Systems

Type	Initial Inspection and Shutdown Test	Subsequent Cross-Connection Test
Municipally supplied recycled water	Yes	Every four years (need not be shutdown test)
Blackwater	Yes	Every four years (need not be shutdown test)
Other auxiliary supply	Yes	No

- d) All Cross-Connection Tests for Dual-Plumbed Systems shall be administered by an Authorized Cross-Connection Control Specialist in the presence of the User Supervisor for the Property. The Authorized Cross-Connection Control Specialist shall submit a written report documenting the results of each test to the Water Quality Division within five business days following completion of the test and include a verification within the report that the User Supervisor was present.

- e) Fees for Cross-Connection Tests overseen by the Water Quality Division are set forth in the SFPUC’s Rate Schedules & Fees for Water and Sewer Service, Schedule W-45, available on the SFPUC website and subject to change at the beginning of each fiscal year.

- f) Any changes to Auxiliary Water systems shall be done under permit from the San Francisco City’s Department of Building Inspection and in conformance with the requirements of the California Plumbing Code, the SFPUC Rules and Regulations for Users Receiving Recycled Water Service in the City and County of San Francisco, San Francisco Health Code Article 12C, and any other state or local law or regulations, as applicable. In the case of conflicting requirements, the more stringent requirements shall apply. If the change to the Auxiliary Water system will alter the existing degree of hazard (e.g., a blackwater treatment system will be installed), the Property Owner shall inform the Water Quality Division at least 30 calendar days before the change is made.

- g) Property Owners shall maintain records of all inspections and Cross-Connection Tests of Dual-Plumbed Systems on their Properties for a period of three years and shall make all records available to the General Manager within five business days of the General Manager’s request.

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Rule 11 - Emergency Cross-Connection Response Plan for Standard-Plumbed and Dual-Plumbed Systems

- a) All emergency response activities and repairs on the Customer side of the water meter for standard-plumbed systems and for operating Dual-Plumbed Systems shall be conducted at the sole expense of the Property Owner.
- b) Upon the discovery of any Cross-Connection, the Property Owner shall immediately notify the SFPUC by calling Millbrae Dispatch at (650) 872-5900 and asking to speak with the on- call Water Quality Division Water Service Inspector. The Property Owner shall inform the Water Service Inspector of the nature of the Cross-Connection, the date and time it was discovered, and the contact information of the Person reporting the Cross-Connection.
- c) The Property Owner shall also submit written notification to the Water Quality Division within 24 hours of the incident and include an explanation of the nature of the Cross- Connection, the date and time it was discovered, and the contact information of the Person reporting the Cross-Connection.
- d) For Dual-Plumbed systems, the Property Owner shall shut down and drain the Auxiliary Water system.
- e) For Dual-Plumbed systems, the General Manager shall shut down the potable water supply at the Point of Connection. For standard-plumbed systems, the General Manager may shut down the potable water supply at the Point of Connection.
- f) The Property Owner shall immediately locate and disconnect the Cross-Connection. If necessary, the Property Owner shall obtain a plumbing permit from the appropriate jurisdiction, as described in Rule 4(a).
- g) The Property Owner shall provide potable drinking water for the Property's occupants, if applicable, until the Property's internal potable water system is deemed safe to drink.
- h) After the Cross-Connection has been remediated, a Property Owner with a standard- plumbed system shall contact the Water Quality Division, which may conduct a visual inspection of the Property to confirm that the Cross-Connection has been eliminated; a Property Owner with a Dual-Plumbed System shall itself conduct a visual inspection and Cross-Connection Test, in accordance with Rule 10.
- i) The Property Owner shall disinfect the Property's internal potable water plumbing system in accordance with the California Plumbing Code, section 609.10.
- j) Twenty-four hours after disinfection, the Property Owner shall flush the Property's internal potable water system and conduct a standard bacteriological test. The Property Owner may request that the Water Quality Division conduct the standard bacteriological test for the fee specified in the SFPUC's *Rate Schedules & Fees for Water and Sewer Service*, Schedule W-43, available on the SFPUC website and subject to change at the beginning of each fiscal year.

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- k) If the results of the bacteriological test are acceptable, the General Manager will restore potable water service.
- l) The Property Owner shall prepare a written report and include an explanation of the nature of the Cross-Connection, the date and time it was discovered, the remedial action taken, and the results of the Cross-Connection Test and bacteriological test. The report shall be submitted to the Water Quality Division within two business days of resumption of potable water service.

Rule 12 - User Supervisor

- a) If required by the Water Quality Division, the Property Owner shall designate a User Supervisor when the Property has a multi-piping system that conveys various types of fluids, some of which may be hazardous, and where changes in the piping system are frequently made.
- b) The Property Owner shall provide the Water Quality Division with written notice of the User Supervisor's designation within five business days of the designation. The Property Owner shall promptly communicate any changes in designation to the Water Quality Division and ensure that the current contact information of the User Supervisor is on file with the Water Quality Division at all times.
- c) The User Supervisor shall be responsible for the avoidance of Cross-Connections during the installation, operation, and maintenance of a Property Owner's pipelines and equipment.
- d) The Property Owner shall ensure that the User Supervisor has, at a minimum, the following qualifications:
 - i. Understanding of the safe, effective operation of the piping systems and components on the Property.
 - ii. Understanding of how to avoid Cross-Connections between piping systems on the Property.
 - iii. Training on the fluids used on the Property.
- e) The Property Owner shall ensure that User Supervisors attend an initial training provided by the SFPUC. If there are significant changes to these Rules and Regulations or applicable laws, rules, or regulations, or there are significant changes to the piping systems on the Property, the SFPUC may require User Supervisors to attend an updated training.
- f) The User Supervisor shall inform the Water Quality Division of changes in piping by contacting the Water Quality Division at least 15 calendar days before making the changes.

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- g) If a Cross-Connection is discovered at the Property, the User Supervisor shall follow the emergency response plan described in Rule 11.
- h) The Property Owner is responsible for the User Supervisor's compliance with the requirements of this Rule 12. Property Owners who fail to comply with this Rule may be subject to enforcement as described in Rule 14.

Rule 13 - General Manager Notices and Inspections

- a) A Property Owner shall eliminate any unprotected Cross-Connection within seven calendar days of receipt of a notice from the General Manager regarding the unprotected Cross- Connection, unless the General Manager authorizes an alternate deadline for remediation within the notice. If a Property Owner refuses or fails to eliminate a Cross-Connection within the timeframe required in the General Manager's notice, the General Manager may proceed with enforcement activities in accordance with Rule 14.
- b) A Property Owner shall provide information about water uses within its Property to the General Manager as directed in any notice from the General Manager requesting such information, as necessary to comply with State of California regulatory requirements for Hazard Assessments. Any Property Owner that does not comply with the General Manager's request for information within the timeframe specified in the notice will be subject to enforcement activities in accordance with Rule 14. Enforcement actions may include, but are not limited to, requiring the Property Owner to install a Reduced Pressure Principal Backflow Prevention Assembly, at the Property Owner's expense, at the Point of Connection to the Public Water System.
- c) Right of Entry: As a condition of receiving water service, a Property Owner shall permit the General Manager to inspect any Property subject to these Rules and Regulations and the requirements of San Francisco Health Code Article 12A to determine compliance with these Rules and Regulations, Article 12A, and any other applicable laws and regulations. The General Manager may exercise this right of entry during normal business hours in the absence of advance notice.
- d) High Risk of Hazard: Whenever the General Manager determines that an existing or potential unprotected Cross-Connection at the Property poses a high risk of hazard to the Public Water System and requires immediate abatement, the General Manager may immediately terminate water service to the subject Property without notice until the Cross- Connection has been eliminated and charge the Property Owner applicable fees.

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Rule 14 - Enforcement, Citations, and Fines

- a) The General Manager may enforce the requirements of San Francisco Health Code Article 12A and these Rules and Regulations by issuance of a written notice establishing a deadline for compliance; modification or termination of water service with the assessment of applicable fees; issuance of Citations; imposition of administrative fines and penalties; and any other available enforcement action. Any action that the General Manager takes may be in addition to, and is not exclusive of or preclusive of, any other available remedy that the SFPUC may pursue in a particular case to ensure a Person's compliance with Article 12A, these Rules and Regulations, and any other applicable law or regulation.
- b) **Deadline for Compliance:** The General Manager may issue a written notice advising the Person that has violated San Francisco Health Code Article 12A and these Rules and Regulations of the required corrective action and establish a deadline for compliance. The Person may seek to meet and confer with the Water Quality Division to establish a plan for compliance.
- c) **Modification or Termination of Water Service:** The General Manager may modify or terminate water service, with written notice to the Property Owner, as well as the Customer if the Property Owner is not the Customer, by:
 - i. Installing a flow restrictor on all non-fire service lines to the Property to minimize the Backflow hazards until they have been corrected, with appropriate fees applied to the Customer's water bill.
 - ii. Disconnecting the noncompliant water service(s) until the Cross-Connection has been eliminated, with appropriate fees applied to the Customer's water bill.
 - iii. Testing the Backflow Prevention Assembly installed at the Property or otherwise correcting the Cross-Connection, with the cost of the test or correction applied to the Customer's water bill.
 - iv. Any other action related to the modification or termination of water service deemed necessary by the General Manager to protect the Public Water System.

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- d) Citations and Fines: Where the General Manager has determined that a Person has violated any provision of San Francisco Health Code Article 12A or any of these Rules and Regulations, the General Manager may enforce Article 12A and these Rules and Regulations by issuing a Citation to the Person in a manner consistent with Chapter 100 of the San Francisco Administrative Code, "Procedures Governing the Imposition of Administrative Fines," as that Chapter may be amended from time to time, and the enforcement provisions of Article 12A. The Citation will be served upon the Person and will specify the amount of the fine imposed for each violation, which shall be up to \$1,000 per violation per day. Each day that a violation continues or there is non-compliance shall constitute a separate violation that may be subject to a separate fine. All violations and respective fines may be cumulative of each other (one Citation may contain multiple fines) and shall be imposed in addition to, and neither exclusive nor preclusive of, any other civil or criminal federal, state, or local fine or penalty under the law or of any other remedy available to the SFPUC under the law. Administrative fines shall be paid to the Treasurer of the City and County of San Francisco.
- e) The General Manager may recover any costs and fees, including but not limited to attorney fees, for enforcement initiated through and authorized under San Francisco Health Code Article 12A and these Rules and Regulations. Fees related to enforcement actions under this Rule will be applied to the Customer's water bill.

Rule 15 - Administrative Review and Appeal

- a) Any Person who has been served with a Citation may seek administrative review of the Citation by filing an appeal with the SFPUC in accordance with the appeal procedures outlined in Chapter 100 of the San Francisco Administrative Code. Consistent with San Francisco Health Code Article 12A, the General Manager shall appoint a hearing officer to conduct the hearing for the appeal, who will determine the time and place of the hearing and provide appropriate notice. The hearing officer shall be an SFPUC employee with no personal knowledge of the incident resulting in the Citation being challenged, and the hearing officer's regular job duties will be outside the direct chain of command of the citing official. The hearing officer may request additional information from the appellant; appellant's failure to provide the information within the time specified by the hearing officer shall result in a decision based on the information available. The hearing officer may, at the hearing officer's sole discretion, invite both the appellant and a representative of the SFPUC Water Enterprise or other City department with knowledge of the Citation to the hearing to state their respective positions and answer questions posed by the hearing officer. Any such hearing may be in person, virtual, or submitted in writing as directed by the hearing officer. The hearing officer shall issue an administrative decision upholding, modifying, or vacating the Citation. The hearing officer's decision shall be final on the date issued. The hearing officer shall issue a decision within 60 calendar days of the date of the receipt of the written appeal.

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- b) Any Permittee who has been served with a notice of suspension or revocation of a Permit to Operate may seek administrative review of the suspension or revocation by submitting a request for review to the General Manager, with a written explanation and supporting documentation, as instructed on the notice. A request for review must be received within 30 days of issuance of the notice. Failure to submit a timely request for review shall be deemed acceptance of the suspension or revocation. The General Manager shall appoint a hearing officer, and the hearing officer shall conduct a hearing on the suspension or revocation, as described in Rule 15(a). The hearing officer shall issue an administrative decision upholding, modifying, or vacating the suspension or revocation. The hearing officer's decision shall be final on the date issued. The hearing officer shall issue a decision within 60 calendar days of the date of the receipt of the request for review, which may be appealed to the San Francisco Board of Appeals in the manner prescribed in San Francisco Business and Tax Regulations Code Article 1.

Rule 16 - Variances

Any request for a variance from the requirements of these Rules and Regulations shall be made in writing and submitted to the General Manager. The General Manager may, at the General Manager's sole discretion, grant variances from specific requirements of these Rules and Regulations on a limited basis provided that the variances do not pose a threat to the Public Water System and are consistent with applicable state and local laws and regulations. All variances are subject to additional mitigation that the Property Owner will be required to implement and maintain.

**SFPUC Rules and Regulation Governing Hydrant Use for
Temporary Water Supply (Excerpt related to
SFFD Connections to Hydrants)**

Expected to be finalized in 2026

**SFPUC Rules and Regulations for Users Receiving Recycled Water
Service in the City and County of San Francisco**

San Francisco Public Utilities Commission Rules and Regulations for Users Receiving Recycled Water Service in the City and County of San Francisco

London N. Breed, Mayor

COMMISSIONERS

Tim Paulson, President

Anthony Rivera, Vice President

Sophie Maxwell

Newsha Ajami

Kate H. Stacy

Adopted: March 26, 2024, by Commission Resolution No. 24-0076

Effective: March 26, 2024



**San Francisco
Water Power Sewer**

Services of the San Francisco Public Utilities Commission

PURPOSE OF AND AUTHORITY FOR THESE RULES AND REGULATIONS

These Rules and Regulations outline the process for obtaining municipal Recycled Water¹ service from the San Francisco Public Utilities Commission (SFPUC) Westside Enhanced Recycled Water Treatment Facility and are intended to ensure the safe and efficient distribution and use of Recycled Water in the City and County of San Francisco. These Rules and Regulations are applicable for use of Recycled Water for landscape irrigation and other outdoor non-potable uses including but not limited to Impoundments and decorative fountains.

Under San Francisco Charter Section 4.112 and Article 8B, the SFPUC has exclusive jurisdiction over San Francisco water supplies and assets. Under the Notice of Applicability issued on June 30, 2023 by the San Francisco Bay Regional Water Quality Control Board, the SFPUC is enrolled under the General Order and authorized to administer its Recycled Water Program including issuing Use Permits to Recycled Water Users and ensuring compliance with the General Order, these Rules and Regulations, and the requirements of the Uniform Statewide Recycling Criteria (California Code of Regulations, Title 22, Division 4, Chapter 3).

¹The terms capitalized are included in the Definitions section below.

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ACRONYMS

Acronyms used in these Rules and Regulations are listed below.

CCR	California Code of Regulations
CDD	SFPUC City Distribution Division
DDW	Division of Drinking Water
MPN	Most Probable Number
NOA	Notice of Applicability
RWQCB	Regional Water Quality Control Board
SFPUC	San Francisco Public Utilities Commission
SWRCB	State Water Resources Control Board
WQD	SFPUC Water Quality Division
WRD	SFPUC Water Resources Division

DEFINITIONS

Unless otherwise expressly stated and defined in a separate Rule and Regulation, the following terms in **bold** font shall, for the purpose of these Regulations, have the meaning indicated following the colon (:)

Definitions denoted with ⁽¹⁾ are from the [SFPUC Rules and Regulations Governing Water Service to Customers](#).

Definitions denoted with ⁽²⁾ are from [SWRCB Order WQ 2016-0068-DDW](#).

Definitions denoted with ⁽³⁾ are from California Health and Safety Code and the California Code of Regulations (CCR).

The definitions from sources 1 through 3 described above are provided in these Rules and Regulations for convenience. The definitions from other sources may be amended from time to time. Please refer to the most recent versions of those sources for the latest definitions. Bracketed text represents additional information, acronyms, or clarifications to definitions made by the San Francisco Public Utilities Commission (SFPUC).

Administrator²: [The SFPUC is the] entity ([Recycled Water] Producer, Distributor, User, or legal entity) that submits a [Notice of Intent] and application fee to the [RWQCB] for coverage under [the] General Order. An Administrator may issue Use Permits for uses of Recycled Water consistent with the Uniform Statewide Recycling Criteria. An Administrator is responsible for coordinating, collecting data, and reporting the monitoring reports to the [RWQCB].

Advanced-Treated Recycled Water: Recycled Water meeting or exceeding disinfected tertiary treated level.

Agronomic Rates²: The rate of application of Recycled Water to plants necessary to satisfy the plants' evapotranspiration requirements, considering allowances for supplemental water (e.g., effective precipitation), irrigation distribution uniformity, and leaching requirement, thus minimizing the movement of nutrients below the plants' root zone.

Approved Backflow Prevention Assembly¹ (Backflow Prevention Assembly): An assembly used to prevent the backflow of substances into the public water system. The assembly must be approved for such use by the University of Southern California Foundation for Cross-Connection Control and Hydraulic Research, or comparable organization approved by the General Manager, and be in proper working order.

Approved Uses: Use of Recycled Water in a manner and for the purpose designated in the Recycled Water Use Permit issued by the SFPUC, and in accordance with all laws.

Approved Use Area (Use Area): A site with defined boundaries, as designated in the Recycled Water Use Permit, authorized to receive Recycled Water for Approved Uses and in compliance with all laws.

Authorized Cross-Connection Control Specialist¹: Any person who possesses a current certification to administer a Cross-Connection control test and to conduct site surveys to assess Cross-Connection control requirements and is authorized by the General Manager to do such

work in the City in accordance with [the *Rules and Regulations Governing Water Service to Customers*].

Construction: New construction of pre-designed, detailed planning of distribution piping and related recycled-water facilities or modification of the On-Site Recycled Water System through Retrofits.

City: The City and County of San Francisco.

Cross-Connection¹: Any unprotected actual or potential connection between any part of a Potable Water system used or potentially used to supply water for drinking purposes and any source or system containing water or any other substance that is not or cannot be approved as safe, wholesome and potable.

Cross-Connection Test¹: A test administered by an Authorized Cross-Connection Control Specialist to verify that no physical uncontrolled connection exists between the Potable Water piping and [any water other than Potable Water such as Non-Potable Water] piping system.

Disinfected Tertiary Recycled Water³: A filtered and subsequently disinfected wastewater that meets the following criteria: (a) The filtered wastewater which has been disinfected by either: (1) A chlorine disinfection process following filtration that provides a contact time (CT, the product of total chlorine residual and modal contact time measured at the same point) value of not less than 450 milligram-minutes per liter at all times with a modal contact time of at least 90 minutes, based on peak dry weather design flow; or (2) A disinfection process that, when combined with the filtration process, has been demonstrated to inactivate and/or remove 99.999 percent of the plaque forming units of F-specific bacteriophage MS2, or polio virus in the wastewater. A virus that is at least as resistant to disinfection as polio virus may be used for purposes of the demonstration. (b) The median concentration of total coliform bacteria measured in the disinfected effluent does not exceed an MPN of 2.2 per 100 milliliters utilizing the bacteriological results of the last seven days for which analyses have been completed and the number of total coliform bacteria does not exceed an MPN of 23 per 100 milliliters in more than one sample in any 30 day period. No sample shall exceed an MPN of 240 total coliform bacteria per 100 milliliters. 22 CCR § 60301.230.

Distributor²: [The SFPUC is the] private or public agency which receives Recycled Water from a [Recycled Water] Producer for the purpose of distribution to Users.

Division of Drinking Water (DDW): DDW, a subdivision of the SWRCB, reviews and approves the Title 22 Engineering Report and provides recommendations to the Regional Water Boards to address the protection of public health.

Freeboard: Vertical clearance measured between Recycled Water surface level and maximum level of Recycled Water storage pond or Impoundment.

General Manager: The General Manager of the SFPUC, or the General Manager's designee.

General Order: SWRCB Order WQ 2016-0068-DDW, Water Reclamation Requirements for Recycled Water Use.

Hose Bib³: A faucet or similar device to which a common garden hose can be readily attached. 22 CCR § 60301.400. Hose Bibs are not allowed, especially in areas accessible by the Public, and only Quick Couplers allowed per 22 CCR 60310.

Impoundments: Includes Landscape Impoundments, Nonrestricted Recreational Impoundments, and Restricted Recreational Impoundments.

Incidental Runoff²: Unintended small amounts (volume) of Runoff from Recycled Water Use Areas, such as unintended, minimal Overspray from sprinklers that escapes the Recycled Water Use Area. Water leaving a Recycled Water Use Area is not considered incidental if it is part of the facility design, if it is due to excessive application, if it is due to intentional overflow or application, or if it is due to negligence.

Landscape Impoundment³: Impoundment in which Recycled Water is stored or used for aesthetic enjoyment or landscape irrigation, or which otherwise serves a similar function and is not intended to include Public contact. 22 CCR § 60301.550.

Lateral Lines¹ (Laterals): The water delivery pipeline that supplies water to the emitters or sprinklers from the Valve.

Non-Potable Water¹: Includes Recycled Water, blackwater, graywater, foundation drainage, or harvested rain water. Non-Potable Water is suitable for uses such as landscape irrigation or water features. This water is not intended for human consumption.

Nonrestricted Recreational Impoundment³: Impoundment of Recycled Water, in which no limitations are imposed on body-contact water recreational activities. 22 CCR § 60301.620.

Notice of Applicability (NOA): Issued by SWRCB or RWQCB to Administrator to authorize the Recycled Water use and distribution program.

Notice of Intent (NOI): Submitted by proposed Administrator to RWQCB per Attachment A of General Order describing proposed water recycling program to obtain coverage under the General Order.

Off-Site Recycled Water System: Recycled Water facilities, including but not limited to pipelines, Laterals, and related appurtenances, upstream of the Point of Connection, associated with the production and distribution of Recycled Water that are owned, operated, and maintained by the SFPUC.

On-Site Recycled Water System: Recycled Water facilities, including but not limited to pipelines, Laterals, and related appurtenances, downstream of the Point of Connection, that are owned, operated, and maintained by User.

On-Site Retrofits (Retrofits): System modifications allowing a property previously served with Potable Water to accommodate Recycled Water, including but not limited to installation or removal of Approved Backflow Prevention Assemblies and replacement of Hose Bibs with Quick Couplers; system identification tags, labels, markings, and colors for system components; installation of Recycled Water use and advisory signage.

Outdoor Eating Area: Public access area with picnic tables and/or benches.

Overspray¹: Irrigation water delivered beyond the [Approved Use] Area.

Plans: Description and drawings of proposed On-Site Recycled Water System for Construction.

Point of Connection: The point where the On-Site Recycled Water System is connected to the Off-Site Recycled Water System, usually at the water meter.

Ponding: Observed Recycled Water that forms a puddle on landscaping or other surfaces, within or outside of the Approved Use Area.

Potable Water³: Water from any source that has been investigated by the health agency having jurisdiction and that has been approved for human consumption.

Proposed Use Area: A site with defined boundaries, as designated in the Recycled Water Use Permit Application, where the applicant proposes to utilize Recycled Water for Approved Uses and in compliance with all laws.

Public: Any person or persons other than the Site Supervisor or staff who may come in contact with facilities and/or areas where Recycled Water is approved for use.

Quick Coupler (Quick Coupling): A device used instead of a Hose Bib to access Recycled Water with the use of key.

Recycled Water²: Water which, as a result of treatment of waste, is suitable for a direct beneficial use or a controlled use that would not otherwise occur and is therefore considered a valuable resource. California Water Code § 13050(n).

Recycled Water Producer²: [The SFPUC is the] entity that produces Recycled Water.

Recycled Water Use Permit or Use Permit² (Water Recycling Use Permit): A permit issued by the Administrator to the Recycled Water User, which is consistent with the requirements specified in [the] General Order, [for their compliant On-Site Recycled Water System prior to and during the delivery of Recycled Water in accordance with these Rules and Regulations].

Recycled Water User (User)²: [A person or entity that] takes physical possession of the Recycled Water from [Recycled Water] Producer and/or Distributor for an approved beneficial Recycled Water use consistent with the Uniform Statewide Recycling Criteria. [A Recycled Water User must apply and be issued a valid Recycled Water Use Permit by the SFPUC. The User may also be the owner of the On-Site Recycled Water System].

Regional Water Quality Control Board (RWQCB): California Regional Water Quality Control Board also known as the Regional Water Board; a regulatory agency that has jurisdiction over the recycling plant and Use Areas. For the City and County of San Francisco, it is the San Francisco Bay Regional Water Quality Control Board.

Restricted Recreational Impoundment³: Impoundment of Recycled Water in which recreation is limited to fishing, boating, and other non-body-contact water recreational activities. 22 CCR § 60301.760.

Runoff¹: Water which is not absorbed by the soil or landscape to which it is applied and flows [away from the Use Area].

Spray: Includes Overspray, Spray Irrigation, and Windblown Spray.

Spray Irrigation³: The application of Recycled Water to crops or vegetation. 22 CCR § 60301.800.

Sprinkler Head¹: A device which delivers water through a nozzle.

State Water Resources Control Board (SWRCB): Also known as the State Water Board, the SWRCB is a statewide regulatory agency, which includes the DDW.

Title 22 (22 CCR): Title 22 of the California Code of Regulations.

Title 22 Engineering Report²: Engineering report prepared [pursuant to 22 CCR section 60323] to describe the manner by which a project or a water recycling program will comply with the Uniform Statewide Recycling Criteria.

Unauthorized Discharge: Any release or spill of Recycled Water that violates the rules and regulations of the City or any applicable Federal, State or local statutes, regulations, ordinances, contracts, or other requirements.

Uniform Statewide Recycling Criteria: The California state regulations for the quality and use of Recycled Water, found in the California Code of Regulations, Title 22, Division 4, Chapter 3.

Use Area³: An area of Recycled Water use with defined boundaries. 22 CCR § 60301.920.

Use Area Supervisor² (Site Supervisor): A person designated, by the owner or manager of the property upon which Recycled Water will be applied, to discharge the responsibility of the owner or manager of the property for: (a) installation, operation and maintenance of a system that enables Recycled Water to be used; (b) for prevention of potential hazards; (c) implementing and complying with conditions of all Water Recycling Use Permits and associated documents; (d) coordination with the Cross-Connection control program of the supplier of drinking water and the local health/environmental health agency; (e) control of on-site piping to prevent any Cross Connections with Potable Water supplies; (f) routine inspection and maintenance of Backflow Prevention Assemblies.

Valve¹: A device used to control the flow of water in the irrigation system.

Violation: Noncompliance with any requirement or condition of the Recycled Water Use Permit or these Rules and Regulations by any person, action or occurrence, whether willful or accidental.

Windblown Spray: Droplets of Recycled Water that are transmitted through the air to locations other than those approved for the direct use of Recycled Water.

GENERAL**APPLICABLE LAWS, RULES, AND REGULATIONS**

All applicable City, State, and federal laws and regulations, including all requirements and specifications in the General Order and Title 22, as now in effect or as they may from time to time be amended, are incorporated by reference into these Rules and Regulations.

SCOPE OF RULES AND REGULATIONS

These Rules and Regulations are applicable for use of Recycled Water for landscape irrigation and other outdoor non-potable uses including but not limited to Impoundments and decorative fountains. These Rules and Regulations are not intended for projects proposing to use separate piping systems for Recycled Water and Potable Water within a facility, where Recycled Water is used to serve plumbing outlets (excluding fire suppression systems) within a building or outdoor landscape irrigation at individual residences.

EMERGENCIES

- (A)** In order to comply with the laws of the United States, the State of California, or the City with respect to any national, state, or local emergency and any related executive and administrative proclamations and orders, each rule or regulation of the SFPUC affected by such emergency shall be suspended or modified to the extent necessary to permit the SFPUC to comply with any such laws, proclamations, and orders during the period they are in effect.
- (B)** When the General Manager determines that an emergency affecting the health, welfare, and/or safety of the Public exists, the General Manager shall be empowered to take such action which, in their discretion and judgment, is necessary or desirable to protect the Public.

RULE 1.0 – RECYCLED WATER USE PERMIT APPLICATION

Proposed Recycled Water Users must apply for a Recycled Water Use Permit (Use Permit) by submitting an Application for Recycled Water Use Permit (Appendix A) to the SFPUC WRD. The Application for Recycled Water Use Permit shall include the following minimum information:

- (A)** Contact name, address, email, and phone number for the User.
- (B)** Overview of the project's proposed On-Site Recycled Water System.
- (C)** Proposed Recycled Water uses and Recycled Water demands (volume).
- (D)** Map showing Proposed Use Area.

The SFPUC WRD will review and notify the proposed User about preparing and submitting Recycled Water Plans.

RULE 2.0 – RECYCLED WATER PLANS

The proposed User is responsible for designing the On-Site Recycled Water System and submitting the Plans (Appendix B) which shall include the following minimum information:

- (A)** Written description of the On-Site Recycled Water System and Use Area.
- (B)** Designated Site Supervisor.
- (C)** Schedule for the Construction, tests, and inspection of the On-Site Recycled Water System.
- (D)** Drawings and written description showing compliance with the design requirements and for proposed Construction (Appendix B).

The SFPUC WRD will review and notify the proposed User if revisions are needed to the Plans. Prior to any Construction, SFPUC WRD must provide final approval to proceed.

RULE 3.0 – INITIAL CROSS-CONNECTION TEST

For irrigation systems to be converted from Potable Water to Recycled Water, before Construction, the User is responsible for conducting an initial Cross-Connection Test in accordance with requirements in the [*SFPUC Rules and Regulations Governing Water Service to Customers, Section G – Cross-Connection Control*](#) and *SFPUC Connection Control Requirements for Properties with Auxiliary Water Systems*.

RULE 4.0 – CONSTRUCTION

Construction of the On-Site Recycled Water System and Proposed Use Areas must be completed in accordance with approved Plans.

RULE 5.0 – INSPECTIONS AND TESTS**5.1 – CONSTRUCTION INSPECTION**

Construction inspections may be conducted to ensure that before backfill, recycled water piping between the Point of Connection and Backflow Prevention Assembly and piping and system component material, color, and markings and installation procedures used are in accordance with the applicable City and State laws, rules, and regulations, and approved Plans.

5.2 – BACKFLOW PREVENTION ASSEMBLY TESTING

The User must refer to and comply with the Backflow Prevention Assembly Testing requirements in the [*SFPUC Rules and Regulations Governing Water Service to Customers, Section G – Cross-Connection Control*](#) and *SFPUC Connection Control Requirements for Properties with Auxiliary Water Systems*.

5.3 – CROSS-CONNECTION TESTING

After Construction is completed and before Recycled Water is provided, the User must contact the WQD for a Cross-Connection Test. The initial test must be overseen and certified by a WQD Water Service Inspector. Subsequent tests may be supervised by a third-party Authorized Cross-Connection Control Specialist. The User is responsible for all Cross-Connection Testing, including all costs, and the User or Site Supervisor must be present during the test.

If the Cross-Connection Test indicates the presence of a Cross-Connection, the User must eliminate the Cross-Connection. After eliminating the Cross-Connection, the User must retest and pass another Cross-Connection Test.

Cross-Connection Testing requirements are detailed in the [*SFPUC Rules and Regulations Governing Water Service to Customers, Section G – Cross-Connection Control*](#) and in Section 9 of *SFPUC Connection Control Requirements for Properties with Auxiliary Water Systems*.

5.4 – IRRIGATION COVERAGE TEST

After passing the Cross-Connection Test for irrigation systems, the User must contact the SFPUC WRD to schedule an irrigation coverage test to ensure that water is only being applied within the Approved Use Areas. The User must attend the coverage test and be responsible for any system adjustments.

If the SFPUC WRD requires modifications to the system, the SFPUC WRD will notify the User in writing of the changes required. Any required modifications to the system must be made within one week of receiving the notification.

RULE 6.0 – SITE SUPERVISOR AND STAFF TRAINING

The Site Supervisor assigned to the Use Area is responsible for the On-Site Recycled Water System, ensuring compliance with the Rules and Regulations and Use Permit requirements, and acts as a liaison to the City regarding the On-Site Recycled Water System. The Site Supervisor, or their designee, must be available by phone 24/7.

Prior to Recycled Water deliveries and Use Permit issuance, the Site Supervisor and staff shall attend a Site Supervisor Training session provided by the SFPUC WRD, which will provide background and knowledge necessary to understand the safe, effective operation and overall management of the On-Site Recycled Water System and its components.

The SFPUC WRD will provide certificates to trained Site Supervisor and staff after completion of the training.

The User must notify the SFPUC WRD within 5 business days of any change in the designated Site Supervisor and must submit an updated Site Supervisor Designation Form (Appendix D) to the SFPUC WRD within a week after the change and obtain an updated Use Permit. The new Site Supervisor shall complete Site Supervisor Training within 30 days of the position change.

If there are significant changes to these Rules and Regulations or applicable laws, rules, or regulations that affect existing uses or Use Areas, the SFPUC WRD may require Site Supervisor and staff to attend updated Site Supervisor training. Failure to attend the training may result in termination of Recycled Water service.

RULE 7.0 – RECYCLED WATER USE PERMIT**7.1 – FINAL ON-SITE RECYCLED WATER SYSTEM INSPECTION AND USE PERMIT ISSUANCE**

The User must request a final inspection to be performed by the SFPUC to ensure that all requirements have been met. The SFPUC WRD shall grant approval of the system after a final inspection. After meeting all conditions above, the SFPUC shall issue the Use Permit to the User, which will specify the Approved Uses, Approved Use Area(s), Site Supervisor, and Recycled Water volume authorized. After issuing the Use Permit, the SFPUC will connect the Off-Site Recycled Water System to the On-Site Recycled Water System.

7.2 – DUTY TO COMPLY WITH RECYCLED WATER USE PERMIT AND RULES AND REGULATIONS

Use of Recycled Water without a valid Use Permit, or in a manner that is inconsistent with a valid Use Permit or these Rules and Regulations, is strictly prohibited.

7.3 – RECYCLED WATER USE PERMIT AMENDMENTS, SUSPENSION, REVOCATION

If the User proposes changes to the Recycled Water uses or volume, Use Area, or On-Site Recycled Water System as described in the Use Permit, the User shall submit an amended Application for Use Permit. The User shall not implement any changes unless and until the SFPUC WRD provides approval for the revised Application and Plans.

Per Rule 10.2, the SFPUC shall have the right to revoke the Use Permit and suspend the delivery of Recycled Water at any time. The SFPUC will not be liable for interruption, shortage, or insufficiency of Recycled Water supply or for any resulting loss or damage.

RULE 8.0 – OPERATIONS AND MAINTENANCE RESPONSIBILITIES**8.1 – MONTHLY SELF-INSPECTION REPORTING**

The Site Supervisor must complete and submit to the SFPUC WRD a Monthly Self-Inspection Report Form (Appendix E) covering the first to last day of the month, submitted by the 15th of the next month.

8.2 – RECORD KEEPING

All Users shall cooperate fully with the SFPUC in record keeping and reporting activities. The Site Supervisor shall keep the following records and documents:

- (A) **As-Built Drawings.** The Site Supervisor must maintain as-built drawings of the On-Site Recycled Water System, showing how the system was actually built (which may differ from the way it was originally designed). If modifications to the system that are needed and approved by the SFPUC WRD, the Site Supervisor must include markups to the as-built drawings.
- (B) Use Permit.
- (C) Reports of all inspections and tests of the On-Site Recycled Water System (e.g., Cross-Connection Control Certification, Backflow Prevention Assembly Certified Test Results).
- (D) Reports of any operational problems and all implemented or planned corrective actions, and the timeline for those corrective actions to resolve the operational problem.
- (E) Written and oral communications with the SFPUC and other City departments about the On-Site Recycled Water System.
- (F) Records of personnel trainings.
- (G) Monthly Self-Inspection Reports.

Copies of these records/documents (electronic acceptable) must be made available to the SFPUC, other City departments, and the SWRQCB or RWQCB upon request at all times.

Failing to retain records and/or submit required reports by the specified deadlines will be considered non-compliance and subject the User to a Violation as specified in Rule 10.2.

SFPUC will review all submitted reports and supporting documentation for completion and accuracy. SFPUC may contact Users regarding any missing information or questions regarding their submissions. SFPUC reserves the right to verify information in Users submissions at any time.

8.3 – ROUTINE MONITORING AND MAINTENANCE

All Users shall cooperate fully with the SFPUC in monitoring and compliance activities. The Site Supervisor shall routinely monitor and perform repairs and regular maintenance to ensure that the On-Site Recycled Water System remains in compliance with these Rules and Regulations, including:

- (A) Regularly monitor the On-Site Recycled Water System and its components.

- (1) For irrigation systems, monitor and maintain Sprinkler Heads, drip irrigation system emitters, Spray nozzles, piping and Valves, pumps, storage facilities, controllers, and any other irrigation system component.
 - (2) Repair any broken or non-functioning components or any other noted condition that violates the Use Permit requirements within 5 business days.
- (B) Ensure all Recycled Water identification requirements are being met per approved Plans.
 - (1) All areas where Recycled Water is used that are accessible to the Public must have appropriate advisory signs, identification tags, labels, stickers, above ground pipeline markings with proper placement and legibility, and purple-colored piping and system components.
 - (2) Defaced, damaged, non-compliant, unreadable, or missing signs, labels, tags, stickers, pipeline markings, and system components must be cleaned and/or replaced within 5 business days.
- (C) Follow and comply with Use Area requirements in approved Plans. Ensure no Recycled Water is used outside the Approved Use Area and no significant Runoff from the Approved Use Area.
 - (1) Ensure Recycled Water Spray, mist, or Runoff shall not contact drinking water fountains, dwellings, designated Outdoor Eating Areas, and food handling facilities. Prevent and eliminate mosquito breeding within 24 hours.
 - (2) For irrigation systems, apply Recycled Water at Agronomic Rates (application of Recycled Water to saturated soil is prohibited/must discontinue irrigation following precipitation events). Monitor and control Overspray and/or Windblown Spray and confine irrigation Ponding and Runoff to the Approved Use Area. The User shall adjust Sprinkler Heads to prevent further Spray, Ponding, or Runoff. Irrigate during periods of minimal Public use or overnight to minimize the potential for contact with the Public. If irrigating during Public use hours, the User shall close and block all pathways during active irrigation using movable A-frame signs marked to inform the Public, employees, and others that Recycled Water is being used. Ensure NO irrigation with Disinfected Tertiary Recycled Water within 50 feet of any domestic water supply well, unless all conditions met per 22 CCR section 60310.
 - (3) For Impoundments, manage in advance of anticipated rainfall events to prevent or minimize overtopping/overflow into surrounding areas and ensure separation from Potable Water wells and reservoirs, including Impoundment with Disinfected Tertiary Recycled Water NOT within 100 feet of any domestic water supply well per 22 CCR section 60310.
- (D) Ensure that any devices or equipment (hoses, pipelines, meters, Quick Couplers, etc.) used for the On-Site Recycled Water System, are not used to convey Potable Water or attached to the Potable Water system.
- (E) Ensure that no backflow or Cross-Connections exist between the Potable Water and On-Site Recycled Water System. Maintain appropriate Backflow Prevention Assembly. If potential backflow or Cross-Connection is discovered, the Site Supervisor must follow Rule 8.5.

8.4 – COMMUNICATIONS AND MEETINGS

The Site Supervisor must communicate with the SFPUC about special events and changes in operations, irrigation schedule, and projected demands in advance of the Monthly Recycled Water Coordination Meetings.

The Site Supervisor or designee must attend the Monthly Recycled Water Coordination Meetings or any meeting scheduled with SFPUC representatives regarding Recycled Water service.

8.5 – EMERGENCY PROCEDURES

- (A) **Cross-Connection and Backflow Incident Procedures.** If a Cross-Connection or backflow incident is suspected or occurs between the On-Site Recycled Water System and a Potable Water system, the Site Supervisor must follow the notification and response procedures in Rule 11 of the [*SFPUC Rules and Regulations Governing Water Service to Customers, Section G – Cross-Connection Control*](#) and in *SFPUC Connection Control Requirements for Properties with Auxiliary Water Systems*.
- (B) **Notification of System Operation Failure.** The Site Supervisor must notify the SFPUC CDD (contact information is included in Appendix G) immediately upon discovery of a Recycled Water system operational failure, such as a break in the system, low pressure, low flow, or the need to disable/disconnect the Off-Site Recycled Water System due to a potential threat to Public health and safety (e.g., discoloration or odor). If applicable, when there is an outage, the Site Supervisor must request backup water supplies from CDD.
- (C) **Emergency Procedures.** In case of an earthquake, flood, fire, nearby construction, or other incident that could cause damage to the Recycled or Potable Water systems, the Site Supervisor must inspect their systems for damage as soon as it is safe to do so. If either the Potable Water system or the On-Site Recycled Water System appears damaged, the Site Supervisor shall shut off the systems, and the Site Supervisor must contact CDD immediately upon discovery of the incident for further instructions.
- (D) **Preventing Unauthorized Discharge or Spills.** The Site Supervisor must ensure that there are no spills or unauthorized discharge of Recycled Water. If there is a spill or unauthorized release of Recycled Water that discharges to land and overflows outside of the Use Area or to surface water or may reach surface water, the Site Supervisor must notify the SFPUC CDD immediately upon discovery of the incident and take emergency response measures to end the discharge or spill. The Site Supervisor must complete the Recycled Water Spill Reporting Form in Appendix F and must submit to SFPUC WRD within 7 calendar days from the date of the spill or unauthorized release, so it can be submitted to RWQCB and DDW.

8.6 – ANNUAL USE AREA INSPECTION

The Site Supervisor must schedule an annual inspection of the On-Site Recycled Water System with the SFPUC WRD.

RULE 9.0 – INTERPRETATION AND SEVERABILITY**9.1 – ADMINISTRATION AND INTERPRETATION OF REGULATIONS**

- (A) The General Manager has the authority to administer and implement these Regulations and to adopt such administrative procedures, consistent with these Regulations, as the General Manager deems necessary to do so.
- (B) In the event that any application of any provision of these Regulations is alleged to be unclear and a determination as to the application of the provision is required, the matter shall be referred to the General Manager. The General Manager's determination as to the application of the provision shall be final.

9.2 – SEVERABILITY

- (C) If a court or agency of competent jurisdiction holds that any Rule, section, subsection, subdivision, paragraph, sentence, clause, or phrase of these Rules and Regulations is for any reason unconstitutional, invalid, or ineffective, such decision shall not affect the validity or effectiveness of the remaining portions of these Rules and Regulations.

The SFPUC hereby declares that it would have passed each rule, section, subsection, subdivision, paragraph, sentence, clause, or phrase, irrespective of whether any one or more sections, subsections, subdivisions, paragraphs, sentences, clauses, or phrases are declared unconstitutional, invalid, or ineffective.

- (D) If a court or agency of competent jurisdiction finds that the application of any provision or provisions of these Rules and Regulations is invalid or ineffective in whole or in part, unless otherwise specified by the court or agency, the effect of such decision shall be limited to the Use Area or situation immediately involved in the controversy, and the application of any such provision to other Use Areas and situations shall not be affected.
- (E) This Section 9.2 shall apply to every portion of these Rules and Regulations as it now exists and as it may exist in the future, including all modifications, additions, and amendments.

RULE 10.0 – INSPECTION AND ENFORCEMENT**10.1 – RIGHT TO INSPECT AND GATHER DOCUMENTATION**

The City, State and/or Regional Water Board staff have the right to enter and inspect the User's On-Site Recycled Water System(s) governed by these Rules and Regulations during normal business hours or during Construction without advance notice. All properties included in an On-site Recycled Water System are subject to inspection, and Users shall allow entry. All documentation required under these Rules and Regulations shall be made available for inspection on request.

10.2 – ENFORCEMENT

- (A) If a User violates any Rule under these Rules and Regulations, the SFPUC may issue a written notice advising the User of required corrective action and establishing a deadline for compliance. The User may seek to meet and confer with the SFPUC to establish a plan for compliance.
- (B) Failure by the User to comply in conformance with the notice requiring corrective action or other mutually agreed-upon plan for compliance shall result in a final 10-day notice to cure.
- (C) Failure by the User to comply with a final 10-day notice to cure shall result in the SFPUC modifying or terminating distribution of Recycled Water to the User as determined in the sole discretion of the SFPUC.
- (D) The SFPUC may in its sole discretion take any other action deemed necessary to protect the public water system.

10.3 – REVIEW PROCESS

- (A) A User may seek review of a Violation or final notice to cure by submitting a written explanation and supporting documentation to recycledwater@sfgwater.org. A request for review must be received by the SFPUC within 30 days of issuance of the Violation or final notice to cure. Failure to submit a timely, written, and documented request for review shall be deemed acceptance of the Violation and/or notice to cure.
- (B) The SFPUC will respond to a timely written request for review with either an effort to work with the User toward compliance or an administrative determination that the Violation stands. The SFPUC will then in its sole discretion take such action under the Permit and these Rules and Regulations as it deems appropriate.

APPENDIX A: APPLICATION FOR RECYCLED WATER USE PERMIT**[SFPUC Rules and Regulations for Recycled Water Use, Rule 1.0]**

Proposed User of Recycled Water: _____

Location Name: _____

Service Address: _____

If applicable, Facility Type (e.g., office building): _____

Expected Date to Commence Recycled Water Service: _____

Contact Name and Company/Organization: _____

Mailing Address: _____

Phone Number: _____

Email: _____

Brief description of proposed Recycled Water use(s), On-Site Recycled Water System and Proposed Use Area (attach map):

Recycled Water (e.g., Landscape Irrigation)	Area (SQ FT)	Estimated Annual Recycled Water Demand (MGD)	Estimated Peak Recycled Water Demand (MGD)

This is a ☐ New Service☐ Existing Service If checked, provide Recycled Water Account No.(s): _____

Existing City Potable Water Account No.(s): _____

Agreement

I certify that I have read, understand, and agree to the *SFPUC Rules and Regulations for Users Receiving Recycled Water Service in the City and County of San Francisco*. The information enclosed is true and accurately represents and demonstrates that the On-Site Recycled Water System will comply with the

Rules and Regulations for Users Receiving Recycled Water Service in the City and County of San Francisco. I agree to defend, indemnify, and hold harmless the SFPUC, its directors, officers, and employees, against all loss, damage, expense, claims, suits and liability, including attorneys' fees in any way connected with the project described in this application.

User Name: _____ Title: _____

Signature: _____ Date: _____

Submit this form, and supporting documents, to:

SFPUC Water Resources Division

recycledwater@sfwater.org

or

San Francisco Public Utilities Commission

Attn: Recycled Water Program

525 Golden Gate Avenue, 10th Floor

San Francisco, CA 94102

APPENDIX B: RECYCLED WATER PLANS REQUIREMENTS AND SUBMISSION FORM**[SFPUC Rules and Regulations for Recycled Water Use, Rule 2.0]**

1. Cross-Connection Control and Backflow Prevention. Per 22 CCR Section 60310, the proposed User shall not make or allow any physical connections between Recycled Water systems and Potable Water systems. The proposed User must indicate the location(s) and type(s) of the Backflow Prevention Assemblies. The proposed User must refer to and comply with the requirements in the [SFPUC Rules and Regulations Governing Water Service to Customers, Section G – Cross-Connection Control](#) and *SFPUC Connection Control Requirements for Properties with Auxiliary Water Systems*.

2. Pipelines, Valves, and Components. The proposed User must show on the drawings all pipelines of Recycled Water, Potable Water, sewage, and others as applicable within the Proposed Use Area. The proposed User must show detailed plan drawings of the Recycled Water pipelines, Valves, and components and indicate existing versus new/proposed. The proposed User must show detailed plan drawings of the backup water system.

3. Above Ground Recycled Water Pipelines Identification. The proposed User must ensure all new above ground Recycled Water pipelines are designed and shown in Plans to include the marking or label in uppercase black lettering on a purple-colored background “RECYCLED WATER – DO NOT DRINK” at no greater than five-foot (5’) intervals.

For existing above ground Recycled Water pipelines, the proposed User must indicate in Plans that pipelines will be wrapped with a minimum of three-inch (3”) purple identification tape marked with continuous one-inch (1”) high uppercase black contrasting wording “RECYCLED WATER – DO NOT DRINK” at no greater than five-foot (5’) intervals. The purple identification tape shall be adhesive, permanent, and weather resistant.

4. Buried Recycled Water Pipelines Identification. The proposed User must ensure all new buried Recycled Water pipelines are designed and shown in Plans to include the marking or label on opposite sides, with uppercase black lettering on a purple-colored background facing upwards when installed, “RECYCLED WATER – DO NOT DRINK” at no greater than five-foot (5’) intervals.

Alternatively, the proposed User may indicate in Plans that:

- Recycled Water pipelines will be wrapped with a minimum of three-inch (3”) purple identification tape marked with continuous one-inch (1”) high uppercase black contrasting wording “RECYCLED WATER – DO NOT DRINK” at no greater than five-foot (5’) intervals
- Purple polyethylene sleeves will be used marked with “RECYCLED WATER – DO NOT DRINK” at no greater than five-foot (5’) intervals

Existing buried pipelines not exposed during Construction do not need to comply with these identification requirements.

5. Components Identification. The proposed User ensure the following list of components are designed and shown in Plans to be clearly identified for Recycled Water use by being purple-colored, weatherproof, durable, and permanently attached and include, imprinted (molded) or on a sticker or identification tag, “RECYCLED WATER – DO NOT DRINK” in uppercase black contrast lettering:

- Valves in below grade Valve Boxes (with at minimum a purple lid and lockable), including but not limited to, Pressure Regulating Valves and Strainers
- Quick Coupler (no Hose Bibs in portions of the Recycled Water piping system in areas subject to access by the general Public)
- Sprinkler Heads, hoses, wands, fittings, or other attachments
- Meters
- Pumps
- Backflow Prevention Assemblies
- Pressure regulators
- Irrigation controls and controller (sticker/nameplate on outside and/or inside)
- Storage tank
- Valves and outlets for Impoundments

6. Signage. The proposed User must show in Plans the proposed sign template and locations of the Recycled Water advisory signs in all Use Areas using Recycled Water accessible to the Public for SFPUC WRD to review and approve. These locations include:

- Major entrances to Approved Use Areas
- Heavily trafficked Public Use Areas and Public pathways
- Near crosswalks
- Driveway entrances, streetscapes, medians
- Irrigation systems within and not surrounded by fencing
- Outdoor Eating Areas and picnic tables
- Decorative fountains
- Impoundments

Signs shall be located where they can be easily seen to inform the Public that Recycled Water is being used in the location. Per 22 CCR Section 60310, signs must be no less than 4 inches (4”) high by 8 inches (8”) wide, include the wording “RECYCLED WATER – NOT FOR DRINKING” and display international symbol similar to a cup with line crossing through it diagonally (see 22 CCR, Figure 60310-A). See Appendix C for advisory sign template.

7. Use Area. The proposed User must show in Plans the location of all domestic water supply wells, drinking water fountains, Outdoor Eating Areas, and food handling facilities within the Proposed Use Area. The following must also be included and shown in Plans about the Use Area:

- Use Area containment measures.
- Protection of active drinking water fountains from Recycled Water Spray, mist, or Runoff.

- Protection of dwellings, designated Outdoor Eating Areas, and food handling facilities from Spray, mist, or Runoff.
- Measures to not allow significant Runoff from Approved Use Areas.
- Measures to prevent and eliminate mosquito breeding within 24 hours.

8. Irrigation System Configuration. The proposed User must also include and show in Plans the following for irrigation systems:

- Description of what will be irrigated (e.g., landscape, food crop).
- Method of irrigation (e.g., spray, flood, or drip).
- Measures to be taken to minimize Ponding and Runoff from leaving the Use Area.
- Direction of drainage and description of the area to which the drainage will flow.
- Protection measures of drinking water fountains and Outdoor Eating Areas.
- Proposed irrigation schedule (if public access is included) and measures to apply Recycled Water at Agronomic Rates (i.e., to discontinue irrigation following precipitation events/not allow irrigation to saturated soil).
- Measures to be taken to exclude or minimize Public contact (e.g., irrigate during periods of minimal Public use or overnight to minimize the potential for contact with the Public; identify pathways to be closed and blocked during irrigation with movable A-frame signs marked to inform the Public, employees, and others that Recycled Water is being used).
- Irrigation with Disinfected Tertiary Recycled Water NOT within 50 feet of any domestic water supply well unless all conditions met per 22 CCR section 60310.

9. Impoundment Configuration. The proposed User must also include and show in Plans the following for Impoundments:

- Impoundment Type (Landscape, Nonrestricted Recreational, Restricted Recreational).
- The direction of drainage/description of the area to which the drainage will flow or overflow system to prevent or minimize overtopping/overflow into surrounding areas in advance of anticipated rainfall events.
- Separation of all Impoundments from Potable Water wells and reservoirs.
- Impoundment with Disinfected Tertiary Recycled Water NOT within 100 feet of any domestic water supply well per 22 CCR section 60310.

Recycled Water Plans Submission Form

Proposed User of Recycled Water: _____

Location Name: _____

Service Address: _____

Contact Name and Company/Organization: _____

Mailing Address: _____

Phone Number: _____

Email: _____

Agreement

I certify that I have read, understand, and agree to the *SFPUC Rules and Regulations for Users Receiving Recycled Water Service in the City and County of San Francisco*. The information enclosed is true and accurately represents and demonstrates that the On-Site Recycled Water System will comply with the *Rules and Regulations for Users Receiving Recycled Water Service in the City and County of San Francisco*. I agree to defend, indemnify, and hold harmless the SFPUC, its directors, officers, and employees, against all loss, damage, expense, claims, suits and liability, including attorneys' fees in any way connected with the project described in this submission.

User Name: _____ Title: _____

Signature: _____ Date: _____

Submit this form, and supporting documents, to:

SFPUC Water Resources Division

recycledwater@sfwater.org

or

San Francisco Public Utilities Commission

Attn: Recycled Water Program

525 Golden Gate Avenue, 10th Floor

San Francisco, CA 94102

APPENDIX C: ADVISORY SIGN TEMPLATE



APPENDIX D: SITE SUPERVISOR DESIGNATION FORM**[SFPUC Rules and Regulations for Recycled Water Use, Rule 6.0]****Property Information**

Use Area Name:
Use Area Address:
User/Department:
Phone:
Property Type:
Uses:

User Contact Information

Name:
Address:
Phone:
FAX:
Email:

Site Supervisor Contact Information

Name:	
Title:	
Address:	
Phone (24 Hour Contact):	
FAX:	
Email:	
<i>I understand, certify, and agree to be the Site Supervisor and to abide to all conditions for Recycled Water Use as set forth in the Use Permit and the SFPUC Rules and Regulations for Users Receiving Recycled Water Service in the City and County of San Francisco.</i>	
Signature: _____	Date: _____
Name: _____	Return this form via email to:
Title: _____	recycledwater@sfgwater.org

APPENDIX E: MONTHLY SELF-INSPECTION REPORT FORM**[SFPUC Rules and Regulations for Recycled Water Use, Rule 8.1]**

Use Area Name:
Site Supervisor:
Use Area Address:
Has the Site Supervisor or Approved Use Areas changed since the last report? ☐ Yes ☐ No
If so, provide information here:

Reporting Month and Year (covers first to last day of month):	
Acreage Applied (Acres):	
Application Rate (Inches/Acre):	
Is there any evidence of Recycled Water escaping the Use Area through surface Runoff or airborne Spray?	☐ Yes ☐ No
Are there any color changes in Recycled Water or odors resulting from the use of Recycled Water?	☐ Yes ☐ No
Is there evidence of prolonged Recycled Water Ponding and/or evidence of mosquitoes breeding within the Use Area due to ponded water?	☐ Yes ☐ No
Are all signs, labels, tags, stickers, and above ground markings posted, legible, and visible per approved Plans?	☐ Yes ☐ No
Is there evidence of leaks, breaks, or plugs in the system pipelines, tubing, drip irrigation, sprinkler emitters, or other appurtenances?	☐ Yes ☐ No
Is there evidence of direct Spraying of Recycled Water on people, streams, passing vehicles, buildings, drinking fountains, or food handling facilities?	☐ Yes ☐ No
If applicable, are there any overflows, color changes, odors, or changes in berm conditions for Impoundments?	☐ Yes ☐ No
If applicable, Freeboard Measurement (include unit e.g., feet):	
If the answer is "yes" to any of the above questions, describe the situation. State the date that the problem was first observed, the specific location where the problem occurred and affected area(s), and any corrective action taken. Attach map showing affected area(s) and if necessary, attach additional sheets. Return this form with attachments by the 15th of the month following the reporting month via email to recycledwater@sfgov.org	

I certify that the information herein complies with the *SFPUC Rules and Regulations for Users Receiving Recycled Water Service in the City and County of San Francisco* and all the information I submit to the SFPUC relating to the On-Site Recycled Water System is complete, true, and correct. The information enclosed is true and accurately represents and demonstrates that the On-Site Recycled Water System will comply with the *Rules and Regulations for Users Receiving Recycled Water Service in the City and County of San Francisco*. I agree to defend, indemnify, and hold harmless the SFPUC, its directors, officers, and employees, against all loss, damage, expense, claims, suits and liability, including attorneys' fees in any way connected with the project described in this form.

Signature of Site Supervisor: _____ Date: _____

APPENDIX F: RECYCLED WATER SPILL REPORTING FORM**[SFPUC Rules and Regulations for Recycled Water Use, Rule 8.5]**

This Form with attachments must be submitted to SFPUC WRD via email (recycledwater@sfgov.org) within 7 calendar days from the date of the spill or unauthorized release, so SFPUC can submit to RWQCB and DDW.

User:	
Contact Name:	
Contact Phone:	
Use Area Name:	
Use Area Address:	
Date:	
Date/time spill or discharge began:	
Date/time spill or discharge ended:	
Location of spill or discharge:	
Did the Recycled Water enter or will it enter storm drains or receiving waters (e.g., rivers, creeks, lakes, or ocean)? If so, identify where entered:	
Estimated volume of spill or discharge (gallons) or estimated flow rate if spill ongoing (gallons/minute):	
Estimated time of repair:	
Agencies/entities involved with repair and/or clean-up:	
Cause of the spill or discharge:	
Corrective actions taken and when, or plan to correct spill/discharge:	
Adverse impacts related to the spill observed, such as excessive sedimentation or a fish kill? If so, describe:	
Recycled Water chlorine residual value (for spills or unauthorized releases of Recycled Water greater than 50,000 gallons that have not been dechlorinated and discharge to surface water)*:	

Attach photograph(s) and coordinates or map of the spill location (can be hand drawn on map)

*If accessible and feasible, provide sampling result at the point of discharge to the surface water.

I certify that the information herein complies with the SFPUC Rules and Regulations for Users Receiving Recycled Water Service in the City and County of San Francisco and all the information I submit to the SFPUC is complete, true, and correct. The information enclosed is true and accurately represents and demonstrates that the On-Site Recycled Water System will comply with the Rules and Regulations for Users Receiving Recycled Water Service in the City and County of San Francisco. I agree to defend, indemnify, and hold harmless the SFPUC, its directors, officers, and employees, against all loss, damage, expense, claims, suits and liability, including attorneys' fees in any way connected with the project described in this form.

Signature of Site Supervisor: _____ Date: _____

APPENDIX G: RECYCLED WATER CONTACTS

Issue or Question	Contact Information
Emergencies and Operational Problems (including Cross-Connection and backflow incident from Recycled Water system into Potable Water system) Cross-Connection Control Certification	San Francisco Public Utilities Commission Water Quality Division Non-emergency: (650) 652-3199 24-hour Emergency Line (on-call WQD Inspector): (650) 872-5900
Distribution of Recycled Water Recycled Water System Emergencies and Operational Problems (including breaks, spills, low pressure, low flow, disconnect/disable Off-Site Recycled System due to threat to Public health and safety) Outages and Backup supplies Recycled Water Meter	San Francisco Public Utilities Commission City Distribution Division 24/7 dispatch for both non-emergency and emergency: (415) 550-4956 24/7 Watch Engineer at Lake Merced Pump Station (for Outages and Backup supplies): (415) 405-4500
SFPUC Rules and Regulations for Users Receiving Recycled Water Service in the City and County of San Francisco Recycled Water Site Supervisors and Training, Use Areas, and Records Operations Plan Updates and Meetings Irrigation Coverage Test, Annual Use Area Inspections Inspection of On-Site Recycled Water Systems During or After Construction or Significant Modification Public Health Concerns related to use of Recycled Water Mosquito breeding from Recycled Water	San Francisco Public Utilities Commission Water Resources Division (415) 551-4514 recycledwater@sfgov.org
Authorized Backflow Prevention Assembly Testers & Companies	San Francisco Department of Public Health https://www.sfdph.org/backflow
Permit to install, replace, or relocate Backflow Prevention Assemblies	San Francisco Department of Building Inspection Plumbing Inspection Services (628) 652-3450 dbionlineservices@sfgov.org

**SFDPH-EH Director's Rules and Regulations
Regarding the Operation of Alternate Water Source Systems**



San Francisco Department of Public Health
Director's Rules and Regulations Regarding the Operation of Alternate Water Source Systems

November 16, 2022

Authority

Article 12C of the San Francisco Health Code established Permitting requirements for the use of alternate water sources and set Permit and annual fees. The San Francisco Department of Public Health (SFDPH) is authorized to perform duties associated with regulating the internal uses of Alternate Water Source Systems through its general authority to provide for the preservation, promotion, and protection of the health of the inhabitants of the City and County [San Francisco Charter Sec.4.110]. Additionally, Article 11 of the City's Health Code authorizes SFDPH Environmental Health Branch (SFDPH-EH) to investigate and abate any nuisance, activity, or condition that the SFDPH-EH deems to be a threat to public health and safety. The Health Code authorizes the SFDPH-EH to order a person to vacate property, cease prohibited activities, abate unsafe or unsanitary conditions, and pay penalties for violations.

Role

The San Francisco Department of Public Health is the permitting agency for the operation of Alternate Water Source Systems in Residential Buildings containing three or more dwelling units, in Mixed-use and Non-residential Buildings, and where Alternate Water Source Systems are shared across property lines. SFDPH-EH is responsible for ensuring that Alternate Water Source Systems are in compliance with applicable laws. SFDPH-EH performs ongoing monitoring, review, and inspections of permitted Alternate Water Source Systems to ensure such compliance is maintained.

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1. Definitions

The terms used in these Rules and Regulations have the following meaning. Where there is a conflict between a definition in these Rules and Regulations and the language in San Francisco Health Code Article 12C (Article 12C) which may be amended from time-to-time, the language in Article 12C shall prevail.

Air Gap: A physical break between a supply pipe and a receiving vessel as set forth in the California Plumbing Code, Chapter 6, Section 603.

Alternate Water Source: Sources of water that can be treated to produce a Non-Potable water. The alternate water source can be Graywater, Rainwater, Stormwater, Foundation Drainage, Blackwater and/or any other source approved by the Director.

Alternate Water Source System: The system of facilities necessary for providing Non-potable Water for use in a Development Project, including but not limited to all collection, treatment, storage, and distribution facilities.

Alternate Water Source System Engineering Report (Engineering Report): Report submitted by Project Applicant to the Director describing the Alternate Water Source System in accordance with these Rules and Regulations.

Annual License Fee: License fee paid annually to the Tax Collector as provided in the San Francisco Business and Tax Regulations Code Section 249.24.

As-Builts: Construction plans that show how the system was actually built (which may differ from the way it was originally designed) and would include all of the drawing sheets including plumbing, architectural, and mechanical.

Blackwater: Wastewater containing bodily or other biological wastes, as from toilets, dishwashers, kitchen sinks and utility sinks.

Certified Laboratory: An environmental testing laboratory certified by the California Environmental Laboratory Accreditation Program or the National Environmental Laboratory Accreditation Program (NELAP). Laboratories must be certified to perform each test for which they are providing results.

Conditional Startup Mode: A period of 90 days after the permit for an Alternate Water Source System is issued during which system operation and performance is verified through more frequent monitoring, analysis and reporting, and during which diversion of treated water to the sewer may be required, as shown in Table 7. The Director may determine that a shorter or longer start-up period will best serve the public health. If Conditional Startup requirements are not met after 365 days have elapsed from permit issuance the permit will expire and a new application must be submitted and approved (except for rainwater or stormwater systems that are not able to meet the requirements in that time due to low rainfall).

Continuous Monitoring: Ongoing confirmation of system performance with the use of sensors, analyzers, meters, and other instrumentation, no less than once every 15 minutes for the continuous observation of selected parameters, including surrogate parameters that are correlated with pathogen Log Reduction Targets (LRTs).

Development Project: Construction of new buildings as defined in Section 12C.2 of Article 12C.

Director: The Director of the San Francisco Department of Public Health or any individual designated by the Director to act on their behalf, including, but not limited, to health inspectors.

Data and Monitoring Report (DMR): A report documenting the operation and water quality results of an Alternate Water Source System permitted under these Rules and Regulations.

Disinfection: A physical or chemical process, including but not limited to ultraviolet irradiation, ozonation, and chlorination that is used for the inactivation of pathogenic microorganisms.

District-scale Project: A Development Project entailing the sharing of an Alternate Water Source System serving two or more parcels where waters cross a property boundary the parcels are owned by one entity or several.

Effluent: General term describing any effluent leaving a unit process that may or may not be “final effluent” and may or may not meet the requirements of Article 12C.

Enforceable Legal Agreement: A legally enforceable agreement defining the roles and responsibilities of each property owner or entity acting as a Permittee, Supplier, or User of an Alternate Water Source System.

Exceedance: A water quality measurement or observation that is outside of a stated limit in these Rules and Regulations” to include measurements that are both above and below an acceptable range of values (e.g. pH).

Excursion (or Abnormal Water Quality): Any water quality condition that is outside of what is usually observed, regardless of whether the observed or measured exceeds any stated water quality limit or criteria.

First Flush Diverter: A device operated by mechanical float valves or other types of automatic control that diverts a quantity of Rainwater collected from a surface following the onset of a rain event. Rainwater systems for subsurface or surface non-spray irrigation seeking to qualify for a permit exemption must have a first flush diverter that does not require manual operation, followed by a 100 µm filter or better.

Foundation Drainage: Nuisance groundwater that is extracted to maintain a building's or facility's structural integrity and would otherwise be discharged to the sanitary or combined sewer system. Foundation Drainage does not include non-potable groundwater extracted for a beneficial use that is subject to City groundwater well regulations.

Graywater: Untreated wastewater that includes, but is not limited to, wastewater from bathtubs, showers, bathroom sinks, clothes washing machines, and laundry tubs, but does not include wastewater from kitchen sinks or dishwashers.

Human Contact Water Use: A use of water which has the potential for human exposure by breathing or by direct contact with skin or eyes. Human Contact Water Uses include, but are not limited to, toilet flushing, spray irrigation, and cooling towers.

Instructions for Alternate Water Source System Annual Reports: Instructions, form or template developed by the Director identifying and describing the required elements of the Alternate Water Source System Annual Report.

Instructions for Alternate Water Source System Engineering Reports: Instructions, form or template developed by the Director identifying and describing the required elements of the Alternate Water Source System Engineering Report.

Log Reduction: The reduction in the concentration of infective pathogens or surrogates through a Treatment Process or Treatment Train expressed in log₁₀ units. A 1-log reduction equates to 90-percent removal, 2-log reduction to 99-percent removal, 3-log reduction to 99.9-percent removal, and so on.

Log Reduction Credit: The log reduction value credited by SFDPH-EH to a treatment technology based the technology's ability to remove or inactivate pathogens and proposed surrogate parameter for continuous monitoring.

Log Reduction Target (LRT): The required degree of pathogen reduction needed to reduce an individual's risk to 1 in 10,000 infections per year through exposure to Non-Potable Water.

Mixed-use Building: A building containing both dwelling units and other Non-residential spaces.

Multi-family Building: A Residential Building containing three or more dwelling units.

Non-Potable Water: Water that has been treated to meet the requirements for non-potable applications under Article 12C and intended to be used on the Project Applicant's site or District and is suitable for direct beneficial use. Non-potable water is not of drinking water quality, but may still be used for many other purposes, depending on its quality.

Non-residential Building: A building that contains occupancies other than dwelling units.

Operations and Maintenance Manual: Document providing comprehensive information on the Alternate Water Source System operation, maintenance, and repair.

Permit: Permit to operate an Alternate Water Source System issued and enforced by SFDPH.

Permittee: The Person(s) who holds a valid permit granted by the Director to operate an Alternate Water Source System, and their agents, employees, and others acting at their direction

Person: Any natural person, corporation, sole proprietorship, partnership, association, joint venture, limited liability corporation, or other legal entity.

Project Applicant: The Person(s) or entity(s) applying for initial authorization to implement or develop an Alternate Water Source System.

Rain Event: For the purposes of informing the Director's decision on the length of the Initial System Start-up Period during system startup for Rainwater and Stormwater sourced systems, each Rain Event is the occurrence of precipitation in an amount exceeding 0.50 inches reported at the National Weather Service San Francisco station (SFOC1), or other applicable location as determined by the Director, preceded and followed by a minimum of 1 hour where less than 0.05 inches precipitation are reported.

Rainwater: Precipitation collected from roof surfaces or other manmade, above ground collection surfaces. Hydrocarbon-based fuels, hazardous materials, or fertilizers are prohibited to be stored or used on such surfaces.

Residential Building: A building that contains only dwelling units.

SFDBI-PID: San Francisco Department of Building Inspection, Plumbing Inspection Division

SFDPH-EH: San Francisco Department of Public Health, Environmental Health

SFPUC: San Francisco Public Utilities Commission

SFPW: San Francisco Public Works Department

Site Supervisor: In a District-scale Project, the qualified person or entity designated by a User and/or a Supplier to oversee the operation and maintenance of the on-site distribution system

and/or collection system and act as a liaison to the Treatment System Manager and/or Permittee.

Spray irrigation: A method of applying water for beneficial use by plants where the water emits from a fixture or device into the air before coming into contact with the soil, ground or plant surface.

Stormwater: Precipitation collected from at-grade or below grade surfaces or from any surface where hydrocarbon-based fuels, hazardous materials, or fertilizers are stored or used shall also be categorized as stormwater.

Subsurface irrigation: A method of applying water for beneficial use by plants where the water is delivered beneath the soil surface.

Supplier: An entity that supplies an untreated Alternate Water Source to the Alternate Water Source System for treatment and production of Non-Potable Water. A Supplier may also be a Permittee and/or User.

Surface non-spray irrigation: A method of applying water for beneficial use by plants where the water is delivered directly at the ground plane via hardware such as a drip emitters or soaker hoses.

Surrogate Parameter: A measurable physical or chemical parameter that is capable of assessing the performance of a Treatment Process in the control of a specific group or groups of pathogens or chemicals.

Treatment Process (or Unit Process): A physical, chemical or biological system that is intended to improve water quality. Examples include filtration, oxidation, adsorption, disinfection and membrane separation.

Treatment Train: A sequence of Unit Processes designed to change the quality of a water as it moves from the first Unit Process to the last one.

Treatment System Manager: The qualified person or entity responsible for the daily management and oversight of the Alternate Water Source System. The Treatment System Manager may also be the Permittee or an entity contracted by the Permittee.

User: An entity that accepts treated water from an Alternate Water Source System for beneficial purposes within its area of occupancy. A User may also be a Permittee and/or Supplier.

Validation Report: Report documenting a detailed technology evaluation study that was conducted by challenging the treatment technology over a wide range of operational conditions to The validation report shall characterize and quantify system performance under a specified set of conditions and include evidence of the treatment technology's ability to reliably and consistently achieve the specified LRT, including information on the required operating conditions and surrogate parameters that require continuous monitoring.

2. Allowed Alternate Water Sources

Collection, storage and/or treatment and subsequent reuse of the following alternate water sources may be permitted under these Rules and Regulations:

- Rainwater
- Stormwater
- Graywater

- Foundation Drainage
- Blackwater

Other alternate sources of water may be permitted if approved under the variance procedure described in **Section 11**.

3. Allowed Uses

The following uses may be permitted under these Rules and Regulations:

- Indoor Reuse
 - Toilet and urinal flushing
 - Priming drain traps
 - Clothes washing¹
- Outdoor Reuse
 - Subsurface irrigation
 - Drip or other surface non-spray irrigation
 - Spray irrigation
 - Decorative fountains and impoundments
 - Cooling applications
 - Dust control/street cleaning

Other uses of Alternate Water Sources may be permitted if approved under the variance procedure described in **Section 11**.

4. Applicability and Permit Requirements

These Rules and Regulations do not apply to (1) Rainwater, Stormwater or Foundation Drainage sourced systems constructed in accordance with applicable plumbing codes and used solely for subsurface irrigation or for surface non-spray irrigation; (2) Graywater sourced systems constructed in accordance with applicable plumbing codes and used solely for subsurface irrigation; nor (3) systems constructed for industrial and closed loop process water reuse.

a. Water Budget Application

Project Applicants shall submit a Water Budget Application for review and approval by the General Manager of the SFPUC, or any individual designated by the General Manager to act on their behalf. The Water Budget Application shall include a description and location of the proposed or existing Alternate Water Source System, the project's water budget, and other applicable information. The Water Budget Application must identify all User(s) and Supplier(s) data.

¹ Clothes washing shall use non-potable water if required by Article 12C of the San Francisco Health Code, except where the plumbing of the clothes washers could cause non-potable water to backflow into potable water systems.

b. Implementation Plan

Only for District-scale Projects, Project Applicants shall submit an Implementation Plan for review and approval by the General Manager of the SFPUC, or any individual designated by the General Manager to act on their behalf.

c. Permit Application

The following are required elements for an Alternate Water Source System Permit application:

Application for a Permit and Fee and Declaration of Healthy and Safe Working

Conditions: Project Applicants shall submit an Application for a Permit to Operate an Alternate Water Source System (Permit Application) to the Director accompanied by the appropriate fee as shown in the SFDPH-EH schedule of fees. Project Applicants shall also submit the Declaration of Healthy and Safe Working Conditions form. District-scale Projects may be charged an additional hourly rate for permit application review and approval.

Engineering Report Approval: Project Applicants shall submit an Alternate Water Source System Engineering Report (Engineering Report) to the Director for review and approval prior to construction plan review and construction. The Engineering Report shall be prepared by a qualified engineer licensed in California and experienced in the field of wastewater treatment, and shall include all items in the Instructions for Alternate Water Source System Engineering Reports. The Engineering Report will not be reviewed unless and until Application fees have been paid to SFDPH-EH. The Director may request revisions to initial and subsequent Engineering Report submittals. The Director shall make reasonable efforts to provide a response to project applicants within 30 days of receipt of a complete application, fee and Engineering Report.

d. Plan Check, System Construction, and Post-Construction Inspection

The following are required after the Engineering Report is approved:

Construction and Inspection: Project Applicant shall apply for applicable building permits and is responsible for ensuring the construction plans are routed to the SFDPH-EH Non-Potable Program for review and approval. Project applicant shall contact the SFDPH-EH Non-Potable Program for a site inspection to verify construction upon completion.

System construction verification shall be provided to SFDPH-EH on company letterhead, signed and stamped by qualified engineer licensed in California stating that the Alternate Water Source System was constructed in accordance with the approved Engineering Report (as modified if applicable), professionally certified plans, specifications and applicable sections of state and local code. SFDPH-EH may request to be present during system construction verification.

If the Alternate Water Source System as constructed differs in any way from the approved Engineering Report, the Project Applicant must submit an addendum or updated Engineering Report to SFDPH-EH. Any modifications to the system design are subject to review and approval by the Director prior to permit approval.

e. Encroachment Permit

Only for District-scale Projects, Project Applicants shall obtain an Encroachment Permit from San Francisco Public Works for infrastructure located within the public right-of-way.

f. Cross-connection Test

Project Applicants shall submit evidence of satisfactory completion of a cross-connection test overseen by a Certified Cross-Connection Control Specialist.

g. Documentation to Obtain Permit-to-Operate

- A finalized Operations and Maintenance Manual that complies with the requirements set forth in Section 9 of these Rule and Regulations;
- An affidavit signed by the designated Treatment System Manager that verifies knowledge, skills, abilities and training to operate the permitted system;
- Evidence of a contract with a Certified Laboratory to perform water quality analysis; and
- Valid Business Registration.
- Proof of Payment of Annual License Fee.

h. Permit Issuance

When the Director determines the applicant has satisfied all the requirements of SFHC12C and these Rules and Regulations, the Director may issue a Permit to Operate the Alternate Water Source system. Permits must be renewed annually by the Permittee as specified in Section 4.c.

i. Permit Renewal

Applicable sampling, analysis and reporting requirements must be continually met for the Permit to remain valid.

Every Permittee shall renew their Permit annually by paying to the Office of the Treasurer and Tax Collector of the City and County of San Francisco the annual License fee set forth in Section 249.24 of the San Francisco Business and Tax Regulation Code. Upon the failure of the Permittee to pay such fees, the Permit shall be suspended and the Permittee shall cease operation until fees and any penalties are paid.

j. Change of Ownership

Within 30 days of a change of ownership of the Alternate Water Source System, it is the responsibility of a new owner to report the change to the Director by submitting a completed Alternate Water Source System Change of Ownership form. The Director may charge an hourly rate for review and approval of any Change of Ownership.

5. System Design Requirements

All systems must comply with System Design Requirements described in 5.a. – 5.j.

a. Cross-Connection Control and Make-up Water Supply

Cross-connection testing shall be completed in accordance with Article 12A of the San Francisco Health Code and the California Plumbing Code prior to initial operation of the system and at intervals thereafter as mandated.

Each municipal water connection (excluding fire services) serving properties with an Alternate Water Source System must be protected by a containment Reduced Pressure Principle

Backflow Prevention Assembly (RP) within 25 feet downstream of the point of connection or water meter.

As shown in Table 1, Alternate Water Source Systems must include municipally supplied make-up water via an air gap to a break tank served from the final treated water storage tank, or via an air gap to the final treated water storage tank, except:

- Make-up Water Supply Exception 1: Irrigation-only systems are not required to include a municipally supplied make-up;
- Make-up Water Supply Exception 2: Rainwater harvesting systems that do not specify an isolation air-gap at the point of municipally supplied make-up may alternatively specify an isolation RP at the point of potable make-up to the Alternate Water Source System.

Table 1: Make-up Supply and Cross-Connection Protection

	Rainwater Source Systems	All other Alternate Water Sources
Municipally supplied make-up water source ¹	Required	Required
Service Meter Protection	Containment RP ² required <25 ft. downstream of municipally supplied water service meter	Containment RP required <25 ft. downstream of municipally supplied water service meter
Protection at the point of municipally supplied make-up to the Alternate Water Source System	Isolation air gap OR Isolation RP	Isolation air gap
¹ Irrigation-only systems are not required to include a municipally supplied make-up.		
² RP = Reduced Pressure Principle Backflow Prevention Assembly		

b. Fail-Safe Mechanisms

All systems must be equipped with features that result in a controlled and non-hazardous automatic shutdown of the process in the event of a malfunction.

c. Flow Meters

All properties collecting, treating, receiving, or distributing water from an Alternate Water Source System shall include at least two Flow Meters: (1) on the treated Alternate Water Source distribution system as close as possible to the exit to the end use and (2) on the potable make-up water pipeline to the Alternate Water Source System.

d. Overflow

All properties collecting, treating, receiving, or distributing water from an Alternate Water Source System shall include overflow connections to the sanitary or combined sewer system with an air gap or other approved backflow prevention device.

e. California Plumbing Code Compliance

All properties collecting, treating, receiving, or distributing water from an Alternate Water Source System shall include components or design features as required by the California Plumbing code, specifically:

1. Signage as required by the California Plumbing Code; signage shall be maintained in good condition and free from damage or removal;
2. For rainwater systems, a first flush diverter or debris excluder as required by the California Plumbing Code;
3. Tanks that receive and/or store untreated graywater and/or blackwater shall be properly vented per the California Plumbing Code.

f. Irrigation System Requirements

Alternate Water Source Systems providing non-potable water for irrigation purposes shall be designed and operated in accordance with the following:

- The treatment, storage, distribution, reuse, or discharge of Alternate Water Sources shall not create a nuisance.
- Treated Alternate Water Sources shall not be applied to designated irrigation areas during periods when soils are saturated and could lead to runoff.
- Treated Alternate Water Sources shall not be allowed to escape the designated irrigation areas as surface flow or spray that would pond and/or enter surface waters.
- Irrigation spray or runoff caused by irrigation shall not enter a dwelling or food handling facility, and shall not contact any drinking water fountain, unless specifically protected with a shielding device.

g. Cooling Application Requirements

Alternate Water Source Systems that serve a cooling tower or other process that could create a mist and may come into contact with employees, members of the public, or building occupants shall comply with the following:

- A drift eliminator shall be used whenever the cooling system is in operation;
- A chlorine or other biocide shall be used to treat the cooling system recirculating water to minimize the growth of Legionella and other microorganisms; and
- A management plan shall be included in the approved Operations and Maintenance Manual

h. Vector control

Alternate Water Source systems shall be constructed and maintained to prevent mosquito harborage. All drains, vents, and other conduits that lead to the system reservoir or collection tank shall be screened with a durable fine mesh sized not greater than one sixteenth of an inch. The mesh shall be firmly installed in an area that is easily accessible for cleaning, inspection and replacement. No gaps shall exist around the mesh.

All annular gaps around pipes feeding the reservoir shall be sealed with a durable, waterproof, non-porous material. A durable gasket with no gaps shall be installed around the door openings

to the reservoir. Other gaps to the reservoir shall either be sealed or screened as specified above.

There shall be at least one employee or contractor that is knowledgeable in the recognition of all mosquito life stages, mosquito life cycle, and the proper treatment of all life stages. This person shall be available to check the system for signs of harborage, respond to complaint of adult mosquitoes, and arrange proper treatment to eliminate mosquitoes. The use of any pesticide shall comply with all local, state, and federal laws.

i. Odor control

All systems must control odors.

j. Unit Process requirements

Specific Unit Process requirements are shown in Table 2.

Table 2: Unit Process Requirements for Specific Source Types

Unit Process Type	Required for these Source Types
Biological Treatment ¹	Graywater, Blackwater
Filtration	Graywater, Blackwater
Minimum UV dose 80 mJ/cm ² and UVT ≥65% if used for LRT	Blackwater
Chlorine Residual for secondary disinfection	Stormwater, Foundation Drainage, Graywater, Blackwater
¹ Biological treatment must result in stabilized, non-putrescible effluent that contains dissolved oxygen.	

6. Water Quality Requirements

An Alternate Water Source System shall be designed and operated to achieve the water quality requirements in this Section.

a. Pathogenic Microorganism Control Log Reduction Targets and Continuous Monitoring

To meet the pathogenic microorganism control requirements for enteric virus, parasitic protozoa and bacteria, Project Applicants must install treatment processes that achieve LRTs as shown in Table 3: Pathogen Log Reduction Targets.

Table 3: Pathogen Log Reduction Targets

Alternate Water Source	Enteric Virus	Parasitic Protozoa	Bacteria
Rain	---	--	3.5
Storm	3.5	3.5	3.0
Storm Outdoor Use Only	3.0	2.5	2.0
Foundation	3.5	3.5	3.0
Foundation Outdoor Use Only	3.0	2.5	2.0
Gray	6.0	4.5	3.5
Gray Outdoor Use Only	5.5	4.5	3.5
Black	8.5	7.0	6.0
Black Outdoor Use Only	8.0	7.0	6.0

Log Reduction Credits. Log Reduction Credits will be allowed based on the ability of each Unit Process to achieve a defined log reduction value. Table 4 summarizes the Log Reduction Credits that may be granted for different Unit Processes and includes examples of required supporting information and surrogate parameters. Other unit processes not included in Table 4 can receive pathogen reduction credit if appropriate evidence is provided. Evidence that the Unit Process can reliably and consistently achieve a specific log reduction value must be included in a Project Applicant's Engineering Report. For Unit Processes that submit validation reports as evidence for Log Reduction Credits, the submitted validation reports must include a letter demonstrating the report has been accepted previously by the California Division of Drinking Water.

Continuous Monitoring. The Engineering Report must include information on the necessary operating conditions and surrogate parameters that require continuous monitoring consistent with Table 4.²

Diversion to Sewer. Applicant must ensure that effluent can be diverted to sewer during Conditional Startup Mode (if required) while still demonstrating the ability of the system to meet the LRTs as specified in the approved Engineering Report. The system must always be capable of diverting to sewer and still supplying makeup water to the end users in the event of a malfunction or water quality problem. Diversion to sewer is always required if a system fails to meet the required LRTs or applicable standards noted in Table 5.

b. Water Sampling and Laboratory Analysis Requirements

Alternate Water Source Systems shall meet the water quality requirements shown in Table 5. For systems required to meet limits for total coliform, BOD, TSS and/or VOC, samples shall be taken from the disinfected effluent and shall be analyzed by a Certified Laboratory. Chlorine residual measurements shall be taken at or after the entry to the plumbing to the distribution system.

Table 4: Treatment Process Log Reduction Credits

Treatment Process	Maximum¹ Log Reduction Credits Virus/Protozoa/Bacteria	Information to be Included in an Engineering Report²	Examples of Continuous Monitoring Requirements
Microfiltration or Ultrafiltration	0/4/0	Description and calculation of how the system defines an acceptable pressure decay test value per the EPA's Membrane Filtration Guidance Manual to detect 3.0 µm breach	Daily pressure decay test Effluent Turbidity
Membrane Biological Reactor (MBR)	1.5/2/4	Operation within the Tier 1 operating envelope ³	Effluent Turbidity
Reverse Osmosis	2/2/2 (Dependent on surrogate parameter)	Manufacturer's information indicating ability to reject sodium chloride and description of/rationale for surrogate parameter used to calculate log removal credits	Influent and Effluent Total Organic Carbon (TOC) or Influent and Effluent Electrical Conductivity
Ultraviolet (UV) Light Disinfection	6/6/6 (Dose Dependent)	UV reactor's Validation Report following state-approved procedures ⁴ or NSF/ANSI 55 Class A validated.	UV intensity UV transmittance Flow rate
Chlorine Disinfection	5/0/0 (CT dependent) Bacteria credit equivalent to virus credit can be granted if free chlorine is preceded by membrane filtration	Calculations demonstrating CT disinfection (CT = Chlorine Residual Concentration x Contact Time) Specifics on how concentration and contact time will be determined	Free chlorine residual Flow rate
Ozone Disinfection	4/3/4 ⁵ (CT dependent)	Calculations demonstrating CT disinfection (CT = Ozone Residual Concentration x Contact Time) Specifics on how concentration and contact time will be determined	Ozone residual Flow rate

¹ Projects may seek higher credit with site-specific validation, alternative surrogates, or other approved methods. Technologies listed are only several of many potential options for unit process selection that may be considered.

² DPH review does not include verification of engineering principles; the responsible party, including but not limited to the Engineering Report authors and the Professional Engineer(s) who signs and stamps the Engineering Report, are responsible for any design errors or miscalculations that result in failure of the system to operate properly and to comply with the provisions of Article 12C, its Rules and Regulations, and any other rule or law.

³ Tier 1 operating envelope is defined in the AWRCE Membrane bio-reactor WaterVal validation protocol, Australian Water Recycling Center of Excellence (AWRCE), Brisbane.

⁴ UV Log Reduction Credits are reactor-specific and dose dependent. UV Validation Reports shall be prepared by a licensed engineer. Validation reports must provide evidence of reactor's ability to reliably and consistently achieve the log reduction value, including information on the required operating conditions and surrogate parameters that require continuous monitoring. The Validation Report shall document results based on validation testing completed utilizing one of the following:

EPA UV Disinfection Guidance Manual (USEPA 2006), or

NWRI UV Disinfection: Guidelines for Drinking Water and Water Reuse, 3rd edition (NWRI 2012)

Submitted validation reports must include a letter demonstrating the report has been accepted previously by the California Division of Drinking Water.

⁵ Bacteria credit can be obtained for ozone according to the Tier 1 framework in the AWRCE Ozone WaterVal Validation protocol, which includes CT tables for waters with turbidity <0.15 NTU.

Table 5: Water Quality Limits and Testing Frequency

Parameter	Limits ¹	Required U.S. EPA Standard Method	Exceedance Requires Immediate Diversion? ¹
Total Coliform		SM9223B	
7-sample median	2.2 MPN/100 mL		No
30 day max / immediate retest value ³	23 MPN/100 mL		Yes
Absolute maximum	240 MPN/100 mL		Yes
Turbidity - Media Filter			
24 hour median	2 NTU		No
95% maximum	5 NTU		No
Absolute maximum	10 NTU		Yes
Turbidity - Membrane Filter			
95% maximum	0.2 NTU		No
Absolute maximum	0.5 NTU		Yes
Turbidity -- Approved System ⁶	10 NTU	SM2130B	Yes
Secondary Chlorine Residual absolute minimum	0.5 mg/L ⁷		Sometimes ⁷
Log Reduction Targets (LRT) ⁶	See Table 3		Yes
Volatile Organic Compounds (VOC)	See Table 6	SM8260B	No
Biological Oxygen Demand (BOD)	25 mg/L	SM5210B	No
Total Suspended Solids (TSS)	30 mg/L	SM2540D	No
pH	6 – 10		No

Rain		Storm		Foundation Drainage		Gray		Black	
Startup ²	Final	Startup ²	Final	Startup ²	Final	Startup ²	Final	Startup ²	Final
Weekly	Monthly ⁴	Weekly	Monthly ⁴	Weekly	Monthly ⁴	Weekly	Monthly ⁴	Daily	Daily ⁵
Continuously in Filter Effluent									
Continuously in Filter Effluent									
Weekly	Monthly	Weekly	Monthly						
Continuously at entry to end-use plumbing									
Continuously using surrogate parameters (See Section 6.a.)									
		Quarterly	Biennial ⁸	Quarterly	Biennial ⁸				
						Weekly	Monthly	Weekly	Monthly
						Weekly	Monthly	Weekly	Monthly
Continuously									

¹ Monitoring results which are outside of any water quality limits in this table do not always require immediate diversion, but shall always be reported as described in Section 7.

² Conditional Startup period is 90 days of operation for all systems as defined in Section 1.

³ Immediate retest is required upon report of a result greater than 23 MPN /100 mL and sampling shall continue daily until a result less than 2.2 MPN/100 mL is reported.

⁴ Total Coliform monitoring frequency may be further reduced or eliminated for Rainwater, Stormwater, Foundation Drainage and Graywater source systems after 12 consecutive months of consistent compliance.

⁵ All blackwater treatment systems shall conduct Total Coliform sampling at least once daily when the treatment system is in operation during Conditional Startup Mode. After maintaining compliance with limits for 90 consecutive samples, blackwater treatment systems for indoor use only may reduce the frequency of sampling to three days per week for Final Use Mode. However, Blackwater treatment systems for irrigation shall continue to conduct sampling at least once daily, even in Final Use Mode.

⁶ Approved Rainwater and Stormwater systems that either (1) had a valid Permit issued by SFDPH-EH on or before August 17, 2017; or (2) did not have a valid Permit but did have an approved Engineering Report on or before August 17, 2017 shall measure turbidity in grab samples weekly during Conditional Startup Mode and monthly during Final Use Mode, and do not have to demonstrate compliance with LRTs using surrogate parameters unless and until the Director approves a system modification that facilitates demonstration of compliance with the LRTs.

⁷ A secondary chlorine residual measurement must be > 0.5 mg/L 95% of the time and never less than 0.3 mg/L. Measurements outside of these limits must be reported to DPH in accordance with Section 7.d. of these rules; diversion may not be required but should be considered while the problem is corrected. Sampling should occur at various locations throughout the building, periodically to monitor the continued presence of disinfectant residual throughout the system.

⁸ Monitoring frequency for Volatile Organic Compounds may be further reduced at the Director's discretion.

Table 6: Volatile Organic Compound (VOC) Limits

VOC	Unacceptable Concentration (mg/L)¹
Benzene	0.1
Carbon Tetrachloride	0.5
1,2-Dichlorobenzene	5.4
1,4-Dichlorobenzene	5.4
1,1-Dichloroethane	14.4
1,2-Dichloroethane	0.1
1,1-Dichloroethylene	0.1
cis-1,2-Dichloroethylene	28.4
trans-1,2-Dichloroethylene	28.4
Dichloromethane	3.1
1,2-Dichloropropane	12.6
1,3-Dichloropropene	0.2
Ethylbenzene	15.6
Methyl-tert-butyl ether	5.2
Monochlorobenzene	1.7
Styrene	7.7
1,1,2,2-Tetrachloroethane	0.3
Tetrachloroethylene	6.1
Toluene	6.8
1,2,4-Trichlorobenzene	1.4
1,1,1-Trichloroethane	68.2
1,1,2-Trichloroethane	1.6
Trichloroethylene	4.8
Trichlorofluoromethane	201.1
1,1,2-Trichloro-1,2,2-Trifluoroethane	272.9
Vinyl Chloride	0.1
Xylenes	15.6
¹ SFDPH-EH derived estimated unacceptable concentrations of VOC's from the U.S. Occupational Safety and Health Administration Permissible Exposure Limits assuming exposure to selected VOCs is by inhalation from volatilization in a closed room.	

7. Monitoring, Sampling, Reporting and Notification Requirements

a. Monitoring and Sampling

The Permittee shall ensure that all operational water quality sampling and reporting requirements are undertaken by a qualified entity as approved by the Director.

Water samples must be collected according to U.S. EPA Wastewater Standard Methods for the Examination of Water and Wastewater Method 9060B or equivalent approved sample collection method and analyzed in a Certified Laboratory using methods specified in Table 5, or through approved in-line monitoring devices as detailed in the Engineering Report. Sample collection, transportation and analysis must meet QA/QC standards of the laboratory, including maintenance of required hold times and temperatures. Laboratory reports must be signed by the laboratory director or a designee. Instrumentation with continuous monitoring capabilities must be installed when continuous monitoring is required.

SFDPH-EH may request to be present during required water quality sample collections.

b. Monthly and Quarterly Reporting

Table 7 summarizes reporting requirements during Conditional Startup and Final Use Modes for different Alternate Water Source Systems.

Conditional Startup: On or before the 15th of each month during Conditional Startup, the Treatment System Manager shall report all required water quality laboratory results and surrogate parameter instrumentation summaries from the previous month. The data shall be accompanied by a signed DMR form provided by the Director and shall include attachments describing any breakdowns, upsets, bypasses, odors, complaints, or other system operation anomalies.

Final Use Mode: During Final Use Mode, Blackwater source systems must report quarterly all data accompanied by the approved DMR. All other Alternate Water Source Systems may report annually, notwithstanding notification requirements in Sections 7.d. and 7.e.

Table 7: Routine Reporting Frequency

Alternate Water Source	Conditional Startup Mode			Final Use Mode
	Duration	Diversion to Sewer ¹	Routine Reporting ²	Routine Reporting ²
Blackwater	90 days	Yes	DMR Monthly	DMR Quarterly + Annual
Graywater	90 days	Yes	DMR Monthly	Annual
Foundation Drainage	90 days	No	DMR Monthly	Annual
Stormwater	90 days	No	DMR Monthly	Annual
Rainwater	90 days	No	DMR Monthly	Annual

¹ During Conditional Startup Mode, blackwater and graywater source systems shall be treated and diverted to the sanitary or combined sewer and all fixtures in the building shall be operated using the municipally supplied make-up water source.

² Surrogate parameters shall be monitored and water samples shall be analyzed by a Certified Laboratory at the frequencies required in Table 5. The Treatment System Manager shall submit results of laboratory analysis along with a completed and signed Data and Monitoring Report as shown in the table. Operational changes, spills, overflows, unanticipated bypasses, other system malfunctions, and/or monitoring results which are outside of the applicable water quality limits shall be reported as described in Section 7.

c. Annual Report:

The Permittee or Treatment System Manager shall submit an Annual Report to the Director by January 15, each year. The Annual Report shall include all items in the Instructions for Alternate Water System Annual Reports, and should describe compliance of the Alternate Water Source System with these Rules and Regulations and the limits and conditions established by the Permit.

The Annual Report for systems that either (1) had a valid Permit issued by SFDPH-EH on or before August 17, 2017; or (2) did not have a valid Permit but did have an approved Engineering Report on or before August 17, 2017 shall include an analysis of the feasibility of implementing changes to the existing treatment design or instrumentation to conform to the LRTs in Table 3 and Continuous Monitoring Requirements in Tables 4 and 5 of these Rules and Regulations.

The Annual Report shall be signed by the Treatment System Manager and the Permittee.

d. Malfunction Notification:

The Treatment System Manager shall notify the San Francisco Department of Public Health, Environmental Health by email at DPH.Nonpotable@sfdph.org of any malfunction that results in or is likely to result in environmental harm or increased public risk.

Initial notification by email shall take place as soon as practicable after the Treatment System Manager becomes aware of the circumstances and include, as applicable:

- A description of the malfunction, including location description
- A description of any component involved in the malfunction
- A description of the suspected causes
- Planned diagnostic and/ or mitigation steps
- The estimated date and time when the malfunction or the effects of the malfunction began and stopped or will be stopped

Follow up notification of a malfunction that results in or is likely to result in environmental harm or increased public risk shall occur by email within 5 days and include the information in the initial notification and any updates, such as:

- Updated information on the cause or suspected cause
- Steps taken or planned to reduce, eliminate, and prevent reoccurrence and a schedule of major milestones for those steps
- Steps taken or planned to mitigate the impacts(s) and schedule of the major milestones for those steps
- Steps taken to notify users

Malfunctions that do not result in any increased risk to public health such as minor excursions from the water quality limits in Table 5 for parameters that do not require diversion to sewer or

anomalous water quality measurements outside of usual levels (even if they do not represent an exceedance) should be noted in the DMR or Annual Report submittals.³

e. Notification of Facility Changes and Other Circumstances:

All changes to the Facility including expansion, production increase, change of end use or source water, or process modification must be approved by the Director. The Permittee or Treatment System Manager shall submit a request in writing to SFDPH-EH, SFDBI-PID, SFPW, and/or SFPUC as applicable prior to any such modification. Changes to the Treatment System process train that affect the calculation of Log Reduction Credits must be submitted by a qualified engineer licensed in California.

The Permittee or Treatment System Manager shall notify all users immediately of any circumstance which indicates that treated water quality may not meet acceptable standards.

8. Recordkeeping

The Treatment System Manager shall maintain system records and available for inspection by the Director, including but not limited to (1) Current Permit; (2) Current treatment system Operations and Maintenance Manual; (3) Signed results delivered by the Certified Laboratory and evidence of chain of custody; (4) Data and Monitoring Reports; (5) Annual Reports; (6) Notifications as described in **Section 7**; (7) A log of all calibrations, maintenance, and major changes in operation; and (8) A log of all system auto-generated alarms, causes and corrective actions. Records shall be maintained for at least two years.

9. Treatment System Operation, Maintenance and Equipment

a. Treatment System Manager Capacity

The Permittee shall directly employ or maintain a service contract with a Treatment System Manager(s) to supervise the operation of the Alternate Water Source System. The Treatment System Manager must:

- Be duly qualified to carry out the operation, maintenance, and monitoring requirements to assure continuous compliance with the conditions set forth in these Rules and Regulations.
- Sign an affidavit attesting that they possess sufficient knowledge, skills, abilities and training to operate the Alternate Water Source System.
- For graywater systems: Must be certified at or above a Grade 2 Water Treatment Plant Operator or at or above a Grade 2 Distribution System Operator or at or above a Grade II Wastewater Treatment Plant Operator by the State Water Resources Control Board's Office of Operator Certification or have comparable education and/or experience to operate a graywater source system.
- For blackwater systems: Must be certified as a Grade II Wastewater Treatment Plant Operator by the State Water Resources Control Board's Office of Operator

³ For example, if a graywater system has been operating for two years and is on annual reporting cycle and normally has Biological Oxygen Demand less than 10 mg/L receives a result of 24 mg/L from a monthly sample, this should be reported on the next annual report to DPH as an anomaly along with a discussion of any possible explanation for the unusual result.

Certification or have comparable education and/or experience to operate a blackwater source system.

The Permittee shall notify the Director in writing within thirty (30) days of replacement or re-designation of Treatment System Manager(s) responsible for supervising system operation (including shifts). This requirement is in addition to other reporting requirements contained in these Rules and Regulations.

b. Operations and Maintenance Manual

A current Operations and Maintenance Manual must be kept on premises and in other locations specified in the manual. The manual shall be reviewed annually and updated as appropriate. The manual shall include all items in the Instructions for Alternate Water System Operations and Maintenance Manuals, including but not limited to descriptions of the treatment system operations, instrumentation, water quality and monitoring reporting plan, troubleshooting, and emergency procedures.

For District Scale Systems, the Operations and Maintenance Manual shall include as any special requirements for Users, Suppliers and Permittee as agreed to in the Enforceable Legal Agreement described in Section 10a of these Rules. A copy of the Enforceable Legal Agreement shall be appended to the Operations and Maintenance Manual.

Systems with any cooling tower end use shall also include a Cooling Tower Water Management Plan as an appendix to the Operations and Maintenance Manual. The purpose of the Cooling Tower Water Management Plan is to describe strategies for preventing the growth of *legionella* and other pathogens in the cooling tower system. The Cooling Tower Water Management Plan shall include the following information specific to the cooling tower end use: recordkeeping; location of the cooling tower in relation to nearby HVAC intake fans or other equipment or receptors of concern; description and maintenance schedule for drift eliminators; start-up and shutdown procedures; disinfection and treatment; procedures for monitoring control measures; and procedures that will be followed if known or suspected legionellosis is associated with the building water system.

c. Equipment

Equipment and instruments used to comply with the treatment and monitoring requirements set forth in these Rules and Regulations shall be calibrated, maintained, and operated consistent with manufacturer's recommendations.

10. Special Requirements for District-Scale Alternate Water Source Systems

District-scale Projects are subject to additional permit requirements as outlined in this section.

a. Enforceable Legal Agreement

Project applicants for District-scale Projects shall provide to the Director an executed Enforceable Legal Agreement defining the roles and responsibilities of each property owner or entity in relation to the maintenance and use of the System. The Permittee and each of the Suppliers and Users shall be included in, and signatories of the agreement. The agreement shall be appended to the approved Operations and Maintenance manual.

b. Special Requirements for Operations and Maintenance for District-scale Projects

The Permittee shall conduct periodic inspections of all facilities to monitor and assure compliance with conditions of the Permit. The Permittee shall take all necessary actions to assure compliance as outlined in the Enforceable Legal Agreement, the Operations and Maintenance Manual, and these Rules and Regulations.

All properties where alternate water is collected, treated and/or used shall allow entry for inspection by the Permittee, Treatment System Manager, and SFDPH-EH and SFDBI-PID inspectors.

All Permittees, Treatment System Managers, Suppliers, and Users shall comply with these Rules and Regulations and other regulations regarding the use of alternate water sources and recycled water.

c. Special Requirements for Notifications and Reporting for District-scale Projects

The Permittee is responsible for all notifications including those which result from equipment failures or system malfunctions on properties which are owned and operated by other entities named in the Legally Enforceable Agreement.

The Permittee shall notify the SFDPH-EH, SFDBI-PID, SFPUC, and SFPW prior to termination of system operation by the Permittee, termination of the approved water source by the Supplier, and/or termination of the acceptance of treated water by a User.

d. Special Requirements for Records and Documentation for District-scale Projects

A copy of the Permit must be provided to all Suppliers and Users in a District-Scale system by the Permittee. The Permittee, Treatment System Manager, Suppliers, and Users must have the Permit available at all times for inspection by SFDPH-EH.

Copies of the current Operations and Maintenance Manual must be kept on premise where each component resides.

e. Site Supervisor

Each User and Supplier shall designate a Site Supervisor to oversee the operation and maintenance of the onsite distribution and or collection systems and act as a liaison to the Permittee or Treatment System Manager. The Site Supervisor must be an employee who is familiar with the plumbing system and available and be able to be reached by phone at all times. The User and or Supplier shall notify the Permittee immediately of replacement or re-designation of Site Supervisor(s). The Permittee shall notify the Director in writing within thirty (30) days of replacement or re-designation.

The Site Supervisor shall be adequately trained to operate and monitor all needed equipment to assure continuous compliance with the conditions set forth in these Rules and Regulations.

The Site supervisor is responsible for:

- Overseeing the maintenance of the collection and/or distribution system;
- Overseeing repairs and/or modifications to the plumbing/sprinkler system to ensure it remains in compliance with all regulatory requirements;

- Maintaining all signs, labels, and tags on system components;
- Acting as a liaison between the actual users of the treated alternate water source and the Treatment System Manager and SFDPH-EH;
- Understanding, and implementing emergency procedures and protocols; and
- Reporting system issues, non-functioning system components, and any other condition that jeopardizes public health and/or permit compliance as needed to the Treatment System Manager and SFDPH-EH.

f. Lockable Valves

All properties collecting, treating, receiving, or distributing water from an Alternate Water Source System shall include lockable valves which can be activated to control the flow of water from any source originating from another property and lockable valves which can be activated to control the flow of water to any user located at another property.

11. Variances and Permit Modifications

a. Water sources and/or end uses

The Director shall have the discretion to grant variances for additional water sources and end uses as set forth in **Sections 2** and **3**, provided that the project applicant provides the anticipated source water quality data and demonstrates that the treatment and end use are protective of public health, including through the provision of analogous system performance. The determination is at the sole discretion of the Director, and shall include appropriate water quality criteria and ongoing monitoring and reporting. A request for variance shall be in writing and submitted to the Director.

b. Sampling requirements and reporting frequencies

The Director shall have the discretion to grant variances from the sampling requirements and the reporting frequencies specified in these Rules and Regulations provided that the project applicant demonstrates that strict interpretation of a standard would cause practical difficulties or unnecessary hardship due to special circumstances and that the requested variances do not pose a threat to the public health. A request for a variance shall be in writing and submitted to the Director. Determination is at the sole discretion of the Director, and no variance shall be granted unless the Director finds that the requested variance is consistent with the purposes of these Rules and Regulations.

Amendments: The Director shall have the discretion to amend the permit requirements for sampling requirements and reporting frequencies on permits older than one year.

12. Enforcement

a. Inspection

SFDPH-EH has the right to enter and inspect any Alternate Water Source System governed by these Rules and Regulations during normal business hours or during construction in the absence of advance notice. All properties included in a District-scale project are subject to inspection, and Permittees, Suppliers and Users shall allow entry. All documentation required under these Rules and Regulations shall be made available for inspection on request.

b. Suspension and Revocation of Permits

Any permit issued for an Alternate Water Source System may be revoked, or suspended by the Director, if the Director determines that continued operation of the system poses unacceptable risk to public or environmental health for any reason, including but not limited to:

- The Alternate Water Source System was built without applicable building and plumbing permits issued by the SFDBI, and, where applicable, encroachment permits issued by Department of Public Works.
- The Permittee has not paid their annual license fee;
- The Treatment System Manager, or any employee has violated any provision of Article 12C or any regulation issued pursuant to Article 12C;
- The Permittee has engaged in any conduct in connection with the operation of the Alternate Water Source System that violates any State or local laws, or any employee of the Permittee has engaged in any conduct that violates any State or local laws while operating Alternate Water Source System, and the Permittee had or should have had actual or constructive knowledge by due diligence that the illegal conduct was occurring;
- The Permittee has engaged in any material misrepresentation when applying for a permit;
- The Alternate Water Source System is being managed, conducted, or maintained without regard for the public health, or the health of patrons and/or employees;
- The Permittee or any employee of the Permittee or any entity entered into a Legally Enforceable Agreement with the Permittee in a District-scale system has refused to allow any duly authorized City official to inspect the premises or the operations of the Alternate Water Source System;
- Based on a determination by another City department, including the Department of Building Inspection, the Fire Department, the Police Department, and/or the Planning Department, that the Alternate Water Source System is not in compliance with any State or local laws; or
- The Permittee is the Permittee or Party responsible for any other permit issued under Article 12C that is currently in violation of these Rules and Regulations.

The Director may not suspend or revoke a permit issued pursuant to Article 12C or take other enforcement action against the Permittee of an Alternate Water Source System until the Director has issued a notice of violation and provided the Permittee an opportunity to be heard and respond as provided in this Section 12 of these Rules and Regulations. Notwithstanding, the Director may immediately suspend any permit issued under Article 12C pending a noticed hearing on revocation or suspension when in the opinion of the Director, the public health or safety requires such immediate suspension. Any affected Permittee or Treatment System Manager shall be given notice of such immediate suspension in writing delivered to the Permittee in person or by registered letter.

c. Violations and Administrative Penalties

The provisions of Chapter 100 of the San Francisco Administrative Code, as amended, shall govern the amount of administrative fines to be charged and the procedures for imposition, enforcement, collection, and administrative review of administrative citations issued to enforce Article 12C.

For purposes of this Rule, “charging official” shall mean the Director, or their designee, “violation” shall mean a violation of Article 12C or these Rules and Regulations, and “violation” shall mean the cited Alternate Water Source System Permittee.

Any Alternate Water Source System Permittee who violates any provision of Article 12C or any Rule or Regulation adopted pursuant to Article 12C may be subject to an administrative penalty not to exceed \$100 for the first violation of a provision or regulation in a 12-month period, \$200 for the second violation of the same provision or regulation in a 12-month period; and \$500 for the third and subsequent violations of the same provision or regulation in a 12-month period.

The Penalty Schedule in Appendix A specifies how violation counts and penalties shall be determined.

Citations will be served to both the Permittee and the Real Property owner in a manner consistent with Chapter 100 of the San Francisco Administrative Code. Payment of fines shall be directed to the San Francisco Department of Public Health Environmental Health Branch Non-Potable Water Program, 49 South Van Ness Avenue, Suite 600, San Francisco, CA 94103.

d. Appeals

Permit Decisions: The final decision of the Director to grant, deny, suspend, or revoke a permit, as provided in Article 12C, may be appealed to the Board of Appeals in the manner prescribed in San Francisco Business and Tax Relations Code Article 1.

Administrative Penalties: The final decision of the Director to impose administrative penalties, as provided in Article 12C may be appealed in the manner described in Administrative Code Chapter 100.

Appendix A: Penalty Schedule

No.	Violation	Penalties for 1 st , 2 nd & 3 rd Violation ¹	Code + Rules Reference
1	Operating without a permit	\$100	12C.5.(a), Rules and Regs Section 4
2	Failure to maintain instruments	\$50, \$200, \$500	12C.5.(b), 12C.8 and Rules and Regs Section 7.a. and 9.c.
3	Failure to conduct required testing	\$100, \$200, \$500	12C.5.(b), 12C.8 and Rules and Regs Section 7.a.
4	Failure to send monthly or quarterly report	\$50, \$200, \$500	12C.5.(b), 12C.8 and Rules and Regs Section 7.b.
5	Failure to send annual report	\$100	12C.5.(b), 12C.8 and Rules and Regs Section 7.c.
6	Failure to report operational problem	\$30, \$60, \$125	12C.5.(b), 12C.8 and Rules and Regs Section 7.d.
7	Failure to report Water Quality excursion	\$50, \$200, \$500	12C.5.(b), 12C.8 and Rules and Regs Section 7.d.
8	Failure to inform DPH of change in facility, production or process	\$100, \$200, \$500	12C.5.(b), 12C.8 and Rules and Regs Section 7.e.
9	Failure to inform users of water quality problem	\$100, \$200, \$500	12C.5.(b), 12C.8 and Rules and Regs Section 7.d.
10	Failure to maintain records	Suspension or revocation of permit ²	12C.5.(b), 12C.8 and Rules and Regs Section 8
11	Failure to inform DPH of change of personnel	\$50, \$200, \$500	12C.5.(b), 12C.8 and Rules and Regs Section 9.a.
12	System operating with unqualified personnel or person who hasn't signed Affidavit	\$100, \$200, \$500	12C.5.(b), 12C.8 and Rules and Regs Section 9.a.
13	Failure to follow O&M plan	\$100, \$200, \$500	12C.5.(b), 12C.8 and Rules and Regs Section 9.b. and 9.c.
14	Initiating installation prior to submittal of application	\$100	12C.6.(a)
15	Failure to provide a Construction Certification Letter	Withhold First Certificate of Occupancy	12C.6.(e)
16	Failure to inform DPH of sale or transfer of building	\$100	12C.10, Rules and Regs Section 4.f.
17	Refusal to allow inspection	Permit suspension or revocation ²	12C.13, Rules and Regs Section 12.a.
18	Failure to conduct 4 year cross-connection test	\$100	Rules and Regs Section 5.a. and SFHC 12A, Title 17 and Title 22
19	Failure to provide water to end-use	\$100	Rules and Regs Section 6.a.

¹ Any permit can be suspended or revoked if multiple violations occur or for other reasons as described in Rules and Regs Section 12.b. First, second and third violations are defined by whether the same violation has occurred in the previous 12 month period.

² Revocation or suspension is governed by Administrative Code 100 and 12C Rules and Regs Section 12.b.

**Excerpt from California Department of Public Health
Compliance Order 02-04-95CO-006**

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ORDER

Pursuant to Section 116655 of the California *Health and Safety Code*, the California Department of Health Services hereby amends Compliance Order 02-04-95CO-006 and orders the Respondents, the City and County of San Francisco and the San Francisco Public Utilities Commission, to perform the following to ensure that the water delivered to the public is at all times pure, wholesome, and potable.

- 1) The City and County of San Francisco shall not cause cross-connections between the AWSS or any other unapproved water supply with the potable water system of the City and County of San Francisco.
- 2) The City and County of San Francisco and San Francisco Public Utilities Commission shall maintain a fire response and cross connection control plan approved by the Department. The plan shall include:
 - a) The dispatch of a water inspector trained in the identification and abatement of cross connections to all two alarm or higher fires in area served by the AWSS or where suction connections to San Francisco Bay or any other unapproved water supply exist or are likely to occur. The inspector shall be authorized to



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2 review all fire fighting operations and abate cross connections.

3 The inspector shall file a written report of his or her findings
4 within 24 hours of each response.

5 b) The reporting of all cross connections discovered during fire
6 fighting operations to the Department as soon as possible but
7 no later than 24 hours after discovery.

8
9 c) Completion of a flushing and monitoring procedure approved by
10 the Department at each cross connection. The SFPUC shall
11 consult with the Department regarding public notification or
12 issuance of a local boil water in response to such cross
13 connection events.

14
15 d) A monthly report of responses to fire fighting operations to the
16 Department by the tenth of each month.

17 e) An annual report to the Department summarizing all response to
18 fire fighting operations, and describing the actions taken to
19 prevent cross connections from occurring.

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22 3) The City and County of San Francisco, the San Francisco Public
23 Utilities Commission and City Distribution Division shall follow a
24 Department approved procedure for oversight of all potable water
25 service connection work in the areas of the City and County of San
26 Francisco served by the AWSS.



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2 4) Within 120 days of the receipt of this order, the City and County of San
3 Francisco shall submit a report to the Department evaluating all
4 services with fire hydrants or similar appurtenances on the premises
5 where a cross connection between San Francisco Bay or any other
6 service with a known unapproved water supply and the potable water
7 supply system may occur in fire fighting operations. This report shall
8 demonstrate that the backflow protection provided meets the
9 regulatory requirements. This investigation may be limited to services
10 in proximity to San Francisco Bay and other known unapproved water
11 supplies where fire hydrants or similar suction connections exist.
12
13

14
15 5) The City and County of San Francisco and the San Francisco Public
16 Utilities Commission shall test or cause to have tested all backflow
17 prevention devices used by the San Francisco Fire Department at least
18 annually and maintain records of that testing.
19

20 6) The City and County of San Francisco and the San Francisco Public
21 Utilities Commission shall report all unprotected connections resulting
22 from fire fighting operations to its consumers annually. The report shall
23 contain a non-technical explanation of the incidents and the potential
24 public health consequences of the cross connections.
25
26
27



1
2 The Department reserves the right to make such modifications to this
3 Order as it may deem necessary to protect public health and safety. Such
4 modifications may be issued as amendments to this Order and shall be
5 effective upon issuance.
6

7
8 All submittals required by this Order shall be addressed to:
9

10 Mr. Clifford L. Bowen, P.E.
11 District Engineer
12 San Francisco District
13 Drinking Water Field Operations Branch
14 California Department of Health Services
2151 Berkeley Way, Room 458
Berkeley, CA 94704.

15 If the Respondent is unable to perform the tasks specified in this Order for any
16 reason, whether within or beyond the Respondent's control, and if the
17 Respondent notifies the Department in writing no less than ninety days in
18 advance of the due date, the Department may extend the time for performance if
19 the Respondent demonstrates that it has made its best effort to comply with the
20 schedules and other requirements of this Order. If the Respondent fails to
21 perform any of the tasks specified in this Order by the time described herein or
22 by the time as subsequently extended pursuant to this paragraph, the
23 Respondent shall be deemed to have failed to comply with the obligations of this
24 Order and will be subject to additional judicial action, including civil penalties
25 specified in Section 116725 of the California *Health and Safety Code*.
26
27



1
2
3 The State of California shall not be liable for any injuries or damages to persons
4 or property resulting from acts or omissions by the Respondent, its employees,
5 agents, or contractors, in performing activities pursuant to this Order, nor shall
6 the State of California be held as party to any contract entered into by the
7 Respondent or its agents in performing activities pursuant to this Order. By
8 issuance of this Order, the Department does not waive any further enforcement
9 actions.
10

11
12 **PARTIES BOUND**
13

14
15 This Order shall apply to and be binding upon the Respondent, its officers,
16 directors, agents, employees, contractors, successors, and assignees.
17

18 **CIVIL PENALTIES**
19

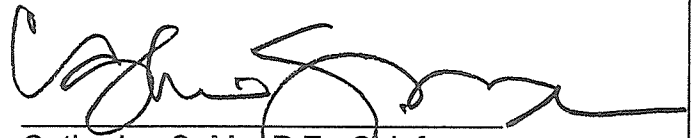
20 Section 116650 (d) and 116650 (e) of the California *Health and Safety Code*
21 allow for the assessment of a civil penalty for failure to comply with the
22 requirements of Chapter 7 of the California *Health and Safety Code* or any
23 citation or order issued thereunder. Failure to comply with any provision of this
24 Order will result in the Department imposing an administrative penalty not to
25 exceed two hundred dollars (\$200) for each day of violation.
26
27



SEVERABILITY

The requirements of this Order are severable, and the Respondent shall comply with each and every provision thereof notwithstanding the effectiveness of any provision.

March 14, 2001
Date


Catherine S. Ma, P.E., Chief
North Coast Region
Drinking Water Field Operations Branch

cc: Department of Public Health
City and County of San Francisco
Attn: Mr. Ken Sato

Mr. Andrew F. DeGraca, P.E.
Water Quality Bureau Manager
San Francisco Public Utilities Commission
1657 Rollins Road
Burlingame, CA 94010

Mr. Tony Flores
City Distribution Division Manager
San Francisco Public Utilities Commission
1990 Newcomb Avenue
San Francisco, CA 94124 -1617

CERTIFIED MAIL NO. 7000 0600 0023 1371 9450



SWRCB Cross-Connection Control Policy Handbook

State Water Resources Control Board

Cross-Connection Control Policy Handbook

Standards and Principles for California's
Public Water Systems

Adopted: December 19, 2023
Effective: July 1, 2024

California Environmental Protection Agency

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Appendix

Appendix A: Assembly Bills 1671 (2017, Chapter 533) and 1180 (2019, Chapter 455)

Appendix B: ASME A112.1.2-2012(R2017) Table 1, Minimum Air Gaps for Generally used Plumbing Fixtures, page 4

Appendix C: Backflow Prevention Assembly Diagrams

Appendix D: High Hazard Premises

Appendix E: General Range of Knowledge for Cross-Connection Control Specialists

Appendix F: Example Backflow Incident Reporting Form

Appendix G: Related Statutes and Regulations

Acronyms and Abbreviations

As used in this policy, acronyms and abbreviations reference the following:

<i>Acronym or Abbreviation</i>	<i>Meaning</i>
AB	Assembly Bill
AG	Air Gap separation
BAT	Best Available Technology
BPA	Backflow Prevention Assembly
Bus. & Prof. Code	Business and Professional Code
CA	California
CBSC	California Building Standards Commission
CCCPH	Cross-Connection Control Policy Handbook
CCR	California Code of Regulations
C.F.R.	Code of Federal Regulations
CHSC	California Health and Safety Code
Civ. Code	Civil Code
DC	Double Check valve backflow prevention assembly
DCDA	Double Check Detector backflow prevention Assembly
DCDA-II	Double Check Detector backflow prevention Assembly – type II
Division	Division of Drinking Water
EPA	Environmental Protection Agency
Gov. Code	Government Code
MCL	Maximum Contaminant Level
Pen. Code	Penal Code
PVB	Pressure Vacuum Breaker backsiphonage prevention assembly
PWS	Public Water System
RP	Reduced Pressure principle backflow prevention assembly
RPDA	Reduced Pressure principle Detector backflow prevention Assembly
RPDA-II	Reduced Pressure principle Detector backflow prevention Assembly – type II
RW	Recycled Water
SB	Senate Bill
SDWA	Safe Drinking Water Act
State Water Board	State Water Resources Control Board
SVB	Spill-resistant Pressure Vacuum Breaker backsiphonage prevention assembly
U.S.	United States

Chapter 1 – Policy Overview

1.1 Objective

The primary objective of the Cross-Connection Control Policy Handbook (CCCPH) is the protection of public health through the establishment of standards intended to ensure a public water system's (PWS) drinking water distribution system will not be subject to the backflow of liquids, gases, or other substances. In addition, by providing basic educational information on backflow prevention, the State Water Resources Control Board (State Water Board) intends to build a foundation of awareness within the regulated community regarding the importance of backflow protection and cross-connection control, leading to the implementation of a robust cross-connection control program for PWSs.

1.2 Applicability

The CCCPH and its standards apply to all California PWSs, as defined in California's Health and Safety Code (CHSC, section 116275 (h)). Compliance with this CCCPH is mandatory for all California PWSs.

1.3 Policy Development Background and Legal Authorities

Through the adoption of the CCCPH, the State Water Board is exercising its authority, under California's Safe Drinking Water Act¹ (SDWA), to establish enforceable standards applicable to California's PWSs. Failure to comply with the CCCPH may result in the issuance of compliance, enforcement, or other corrective actions against a PWS.

1.3.1 California Safe Drinking Water Act

On October 6, 2017, Assembly Bill 1671 (AB 1671) was approved and filed with the Secretary of State (see Appendix A). AB 1671 amended California's SDWA through the establishment of CHSC sections 116407 and 116555.5. AB 1671 also amended section 116810 of the CHSC, which is briefly discussed in Appendix G.

On October 2, 2019, Assembly Bill 1180 (AB 1180) was approved and filed with the Secretary of State. AB 1180 amended Section 116407 of the CHSC and added section 13521.2 to the Water Code. AB 1180 requires that the CCCPH include provisions for the use of a swivel or changeover device (swivel-ell).

¹ CHSC, div. 104, pt. 12, ch. 4, section 116270 et seq.

AB 1671 and 1180 established the following:

- The State Water Board must adopt standards for backflow protection and cross-connection control by January 1, 2020.
- The State Water Board may establish standards for backflow protection and cross-connection control through the adoption of the CCCPH, with the CCCPH not being subject to the requirements of the CA Administrative Procedure Act.²
- If standards for backflow protection and cross-connection control are established via the CCCPH, the State Water Board must:
 - Consult with state and local agencies and persons, identified by the State Water Board, as having expertise on the subject of backflow protection and cross-connection control.
 - Hold at least two public hearings before adoption of the CCCPH.
 - Post the CCCPH on the State Water Board website.
- Upon the effective date of the CCCPH, the previous cross-connection control standards³ become inoperative, and are repealed 90 days later, unless the State Water Board determines not to repeal a specific existing regulation.
- A PWS must implement a cross-connection control program that complies with the standards adopted by the State Water Board.
- Use of a swivel-ell must be consistent with any notification and backflow protection provisions contained in the CCCPH.

The development of the CCCPH included consultation with stakeholders, including state and local agencies, on an array of subjects related to cross-connection control, consistent with the statutory mandate, as well as consideration of input from other stakeholders and the general public in a February 20, 2020 workshop.

Prior to adoption of the CCCPH, in accordance with the statutory mandate, the State Water Board held two public hearings - one on April 27, 2021, and the other on December 5, 2022. A Board Workshop was held on October 18, 2023.

Pursuant to sections 116407 and 116555.5 of the CHSC, the State Water Board chose to adopt standards for backflow protection and cross-connection control through the adoption of this CCCPH, which became effective July 1, 2024.

Aside from the mandates of AB 1671 related to the State Water Board's need and authority to develop and adopt an enforceable CCCPH, there are long-standing statutory mandates in California's SDWA concerning backflow protection and cross-connection control, some of which are summarized below.

² Gov. Code, tit. 2, div. 3, pt. 1, ch. 3.5, section 11340 et seq.

³ Cal. Code Regs., tit. 17, div. 1, ch. 5, subch. 1, grp. 4, arts. 1 & 2, section 7583 et seq.

- The State Water Board is required to adopt regulations for the control of cross-connections that it determines to be necessary for ensuring PWSs “distribute a reliable and adequate supply of pure, wholesome, potable, and healthy water.” (CHSC section 116375, subd. (c).)
- Any person who owns a PWS is required to ensure that the distribution system will not be subject to backflow under normal operating conditions. (CHSC section 116555, subd. (a)(2).)

Prior to AB 1671 and the adoption of this CCCPH, California’s regulations pertaining to cross-connection control were set forth in regulations in CCR Title 17,⁴ which were adopted in 1987 with minor revisions in 2000. Although still protective to public health, the CCR Title 17 cross-connection regulations required updating as both the drinking water and cross-connection control industries had evolved. This CCCPH updates those regulations, which as previously noted are no longer operative following the adoption of the CCCPH.

The State Water Board may update its standards for backflow protection and cross-connection control through revisions of the CCCPH. Prior to adopting substantive revisions to the CCCPH, the State Water Board will consult with state and local agencies and persons identified as having expertise on the subject by the State Water Board, and the State Water Board will hold at least one public hearing to consider public comments.

⁴ Cal. Code Regs., tit. 17, div. 1, ch. 5, subch. 1, grp. 4, arts. 1 & 2, section 7583 et seq.

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Chapter 2 – Background on Backflow Protection and Cross-Connection Control

2.1 What is a Cross-Connection?

A cross-connection is an interconnection between a potable water supply and a non-potable source via any actual or potential connection or structural arrangement between a PWS and any source or distribution system containing liquid, gas, or other substances not from an approved water supply. Bypass arrangements, jumper connections, removable sections, improperly installed swivel or change-over devices and other temporary or permanent devices through which, or because of which backflow can occur are considered to be cross-connections.⁵ The CCCPH includes acceptable installation criteria for swivel-ell and other types of backflow prevention assemblies (BPAs) to prevent backflow.

Backflow is the undesired or unintended reversal of flow of water and/or other liquids, gases, or other substances into a PWS's distribution system or approved water supply.

The presence of a cross-connection represents a location in a distribution system through which backflow of contaminants or pollutants can occur. Backflow occurs when a non-potable source is at a greater pressure than the potable water distribution system. Backflow can occur from either backsiphonage or backpressure. Backsiphonage occurs when a non-potable source enters the drinking water supply due to negative (i.e., sub-atmospheric) distribution system pressure. Backpressure occurs when the pressure from a non-potable source exceeds the pressure in the potable water distribution system.

Backsiphonage may be caused by a variety of circumstances, such as main breaks, flushing, pump failure, or emergency firefighting water demand. Backpressure may occur when heating, cooling, waste disposal, or industrial manufacturing systems are connected to potable supplies and the pressure in the external system exceeds the pressure in the distribution system. Both situations act to change the direction of water, which normally flows from the distribution system to the customer, so that non-potable substances from industrial, commercial, or residential premises flows back into the distribution system through a cross-connection.

Cross-connections are not limited to industrial or commercial facilities. Submerged inlets are found on many common plumbing fixtures and are sometimes necessary features of the fixtures if they are to function properly. Examples of this type of design are siphon-jet urinals or water closets, flushing rim slop sinks, and dental cuspidors.

⁵ California Department of Health Services (DHS), Public Water Supply Branch. (1988). *Guidance Manual for cross connection Control Program (Green Manual)*. California Department of Health Services.

Older bathtubs and lavatories may have supply inlets below the flood level rims, but modern sanitary design has minimized or eliminated this cross-connection in new fixtures. Chemical and industrial process vats sometimes have submerged inlets where the water pressure is used as an aid in diffusion, dispersion and agitation of the vat contents. Even though a supply pipe may be installed above a vat, backsiphonage can still occur. Siphon action has been shown to raise a liquid in a pipe such as water almost 34 feet. Some submerged inlets are difficult to control, including those which are not apparent until a significant change in water level occurs or where a supply may be conveniently extended below the liquid surface by means of a hose or auxiliary piping. A submerged inlet may be created in numerous ways, and its detection may be difficult.

Chemical and biological contaminants have caused illness and deaths during known incidents of backflow, with contamination affecting several service connections, and the number of incidents reported is believed to be a small percentage of the total number of backflow incidents that actually occur. The public health risk from cross-connections and backflow is a function of a variety of factors including cross-connection and backflow occurrence and type and amount of contaminants.

2.2 Purpose of a Cross-Connection Control Program

The purpose of a cross-connection control program is to prevent the occurrence of backflow into a PWS's distribution system in order to protect customers from contamination or pollution from any on-site hazards. Properly installed and maintained BPAs, devices or methods provide protection against the threat posed by many conditions typically found on a user's premise.

The use of approved BPAs ensures that the appropriate performance evaluation of the assembly was conducted. It is important and required by the CCCPH to select and properly install an approved BPA that is capable of protecting the distribution system from the hazard identified. The success of a program depends on individuals that are knowledgeable about cross-connection control to identify actual and potential hazards, apply principles of backflow protection and prevention, and implement cross-connection control policies and procedures. A successful program will have ongoing surveillance of a PWS to ensure BPAs, devices or methods are working, and identify new hazards or changes in the distribution system. Certified specialists are needed to properly evaluate the degree of hazard that exists in the distribution system. Hazards typically identified in distribution systems along with the required level of protection are specified in Chapter 3 of the CCCPH.

2.3 Notes on Applicability of the Cross-Connection Control Policy Handbook

The CCCPH provides the basis for regulating the use and management of cross-connection control programs and BPAs in PWSs, and related requirements for supporting programs and policies. Activities or uses outside of the scope of the

authority of the State Water Board to regulate PWSs are not regulated by the CCCPH, including California Plumbing Code requirements and definitions not related to PWSs.

Recycled water cross-connection control installations and programs for the purposes of protecting the recycled water supply are not regulated by the CCCPH, although a PWS that uses recycled water is regulated by the CCCPH to ensure that a PWS's drinking water system has adequate backflow protection from a recycled water system.

Water systems that do not meet the definition of a PWS (e.g. "State Small Water Systems" under CCR Title 22, Article 3) are not regulated by the CCCPH, although they may need to comply with the California Plumbing Code, local health agencies, and other laws or entities.

Transient noncommunity and nontransient noncommunity systems are PWSs and must comply with both the California Plumbing Code and CCCPH. The California Plumbing Code and the CCCPH will overlap in protection of these user premises. To ensure compliance, these noncommunity water systems may need to have internal cross-connection control programs within the user premises.

Noncommunity water systems must have the ability to enforce backflow protection within the premises. Compliance with the California Plumbing Code can be verified by the PWS and used for compliance with the CCCPH. Compliance with the CCCPH is documented through the hazard assessment and maintenance of an inventory of field-testable BPAs and methods. Annual field testing of BPAs is required. Where the minimum backflow protection differs between the California Plumbing Code and the CCCPH, the more protective minimum protection will be required.

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Chapter 3 – Standards for Backflow Protection and Cross-Connection Control

Article 1 – Definitions and General Requirements

3.1.1 Definitions

The following definitions apply to the terms used in the CCCPH:

“Air-gap separation” or **“AG”** means a physical vertical separation of at least two (2) times the effective pipe diameter between the free-flowing discharge end of a potable water supply pipeline and the flood level of an open or non-pressurized receiving vessel, and in no case less than one (1) inch.

“Approved water supply” means a water source that has been approved by the State Water Board for domestic use in a public water system and designated as such in a domestic water supply permit issued pursuant to section 116525 of the CHSC.

“Auxiliary water supply” means a source of water, other than an approved water supply, that is either used or equipped, or can be equipped, to be used as a water supply and is located on the premises of, or available to, a water user.

“Backflow” means an undesired or unintended reversal of flow of water and/or other liquids, gases, or other substances into a public water system’s distribution system or approved water supply.

“Backflow prevention assembly” or **“BPA”** means a mechanical assembly designed and constructed to prevent backflow, such that while in-line it can be maintained and its ability to prevent backflow, as designed, can be field tested, inspected and evaluated.

“Backflow prevention assembly tester” means a person who is certified as a backflow prevention assembly tester.

“Community water system” means a public water system that serves at least 15 service connections used by yearlong residents or regularly serves at least 25 yearlong residents of the area served by the system.

“Contact hour” means not less than 50 minutes of a continuing education course.

“Continuing education course” means a presentation or training that transmits information related to cross-connection control programs and backflow prevention and protection.

“Cross-connection” means any actual or potential connection or structural arrangement between a public water system, including a piping system connected to the public water system and located on the premises of a water user or available to the water user, and any source or distribution system containing liquid, gas, or other substances not from an approved water supply.

“Cross-connection control specialist” means a person who is certified as a cross-connection control specialist.

“Distribution system” has the same meaning as defined in section 63750.50 of CCR, Title 22, Division 4, Chapter 2.

“Double check detector backflow prevention assembly” or **“DCDA”** means a double check valve backflow prevention assembly that includes a bypass with a water meter and double check backflow prevention assembly, with the bypass’s water meter accurately registering flow rates up to two gallons per minute and visually showing a registration for all rates of flow. This type of assembly may only be used to isolate low hazard cross-connections. See Diagram 1, Appendix C.

“Double check detector backflow prevention assembly – type II” or **“DCDA-II”** means a double check valve backflow prevention assembly that includes a bypass around the second check, with the bypass having a single check valve and a water meter accurately registering flow rates up to two gallons per minute and visually showing a registration for all rates of flow. This type of assembly may only be used to isolate low hazard cross-connections. See Diagram 2, Appendix C.

“Double check valve backflow prevention assembly” or **“DC”** means an assembly consisting of two independently-acting internally-loaded check valves, with tightly closing shut-off valves located at each end of the assembly (upstream and downstream of the two check valves) and fitted with test cocks that enable accurate field testing of the assembly. This type of assembly may only be used to isolate low hazard cross-connections. See Diagram 3, Appendix C.

“Existing public water system” or **“existing PWS”** means a public water system initially permitted on or before July 1, 2024 as a public water system by the State Water Board.

“Hazard Assessment” means an evaluation of a user premises designed to evaluate the types and degrees of hazard at a user’s premises.

“High hazard cross-connection” means a cross-connection that poses a threat to the potability or safety of the public water supply. Materials entering the public water supply through a high hazard cross-connection are contaminants or health hazards. See Appendix D for some examples.

“Low hazard cross-connection” means a cross-connection that has been found to not pose a threat to the potability or safety of the public water supply but may adversely affect the aesthetic quality of the potable water supply. Materials entering the public water supply through a low hazard cross-connection are pollutants or non-health hazards.

“New public water system” or **“new PWS”** means a public water system permitted after July 1, 2024 as a public water system by the State Water Board. A new public water system includes a public water system receiving a new permit because of a change in ownership.

“Noncommunity water system” means a public water system that is not a community water system.

“Nontransient noncommunity water system” means a public water system that is not a community water system and that regularly serves at least 25 of the same persons over six months per year.

“Premises containment” means protection of a public water system’s distribution system from backflow from a user’s premises through the installation of one or more air gaps or BPAs, installed as close as practical to the user’s service connection, in a manner that isolates the water user’s water supply from the public water system’s distribution system.

“Pressure vacuum breaker backsiphonage prevention assembly” or **“PVB”** means an assembly with an independently-acting internally-loaded check valve and an independently-acting loaded air inlet valve located on the discharge side of the check valve; with test cocks and tightly closing shutoff valves located at each end of the assembly that enable accurate field testing of the assembly. This type of assembly may only be used for protection from backsiphonage and is not to be used to protect from backpressure. See Diagram 4, Appendix C.

“Public water system” or **“PWS”** has the same meaning as defined in section 116275(h) of the CHSC.

“Recycled Water” is a wastewater which as a result of treatment is suitable for uses other than potable use.

“Reduced pressure principle backflow prevention assembly” or **“RP”** means an assembly with two independently acting internally-loaded check valves, with a hydraulically operating mechanically independent differential-pressure relief valve located between the check valves and below the upstream check valve. The assembly shall have shut-off valves located upstream and downstream of the two check-valves, and test cocks to enable accurate field testing of the assembly. See Diagram 5, Appendix C.

“Reduced pressure principle detector backflow prevention assembly” or **“RPDA”** means a reduced pressure principle backflow prevention assembly that includes a bypass with a water meter and reduced pressure principle backflow prevention assembly, with the bypass’s water meter accurately registering flow rates up to two gallons per minute and visually showing a registration for all rates of flow. See Diagram 6, Appendix C.

“Reduced pressure principle detector backflow prevention assembly – type II” or **“RPDA-II”** means a reduced pressure principle backflow prevention assembly that includes a bypass around the second check, with the bypass having a single check valve and a water meter accurately registering flow rates up to two gallons per minute and visually showing a registration for all rates of flow. See Diagram 7, Appendix C.

“Spill-resistant pressure vacuum breaker backsiphonage prevention assembly” or **“SVB”** means an assembly with an independently-acting internally-loaded check valve and an independently-acting loaded air inlet valve located on the discharge side of the check valve; with shutoff valves at each end and a test cock and bleed/vent port, to enable accurate field testing of the assembly. This type of assembly may only be used for protection from backsiphonage and is not to be used to protect from backpressure. See Diagram 8, Appendix C.

“State Water Board”, unless otherwise specified, means the State Water Resources Control Board or the local primacy agency having been delegated the authority to enforce the requirements of the CCCPH by the State Water Resources Control Board.

“Swivel-Ell” means a reduced pressure principle backflow prevention assembly combined with a changeover piping configuration (swivel-ell connection) designed and constructed pursuant to this Chapter. See design and construction criteria, as well as Diagrams 9a and 9b, Appendix C.

“Transient noncommunity water system” means a noncommunity water system that does not regularly serve at least 25 of the same persons over six months per year.

“User premises” means the property under the ownership or control of a water user and is served, or is readily capable of being served, with water via a service connection with a public water system.

“User’s service connection” means either the point where a water user’s piping is connected to a water system or the point in a water system where the approved water supply can be protected from backflow using an air gap or backflow prevention assembly.

“User Supervisor” means a person designated by a water user to oversee a water use site and responsible for the avoidance of cross-connections.

“Water supplier” means a person who owns or operates a public water system.

“Water user” means a person or entity who is authorized by the PWS to receive water.

3.1.2 Applicability

A public water system (PWS) must comply with the requirements of the CCCPH.

3.1.3 Program for Public Water System Cross-Connection Control

(a) A PWS must protect the public water supply through implementation and enforcement of a cross-connection control program. Unless otherwise specified by this Chapter or directed by the State Water Board, a PWS may implement its cross-connection control program, in whole or in part, either directly or by way of contract or agreement with another party. The PWS, however, shall not be responsible for abatement of cross-connections which may exist within a user's premises. The cross-connection control program must include at a minimum the following elements:

(1) **Operating rules or ordinances** – Each PWS must have operating rules, ordinances, by-laws or a resolution to implement the cross-connection program. The PWS must have legal authority to implement corrective actions in the event a water user fails to comply in a timely manner with the PWS's provisions regarding the installation, inspection, field testing, or maintenance of BPAs required pursuant to this Chapter. Such corrective actions must include the PWS's ability to perform at least one of the following:

- (A) deny or discontinue water service to a water user,
- (B) install, inspect, field test, and/or maintain a BPA at a water user's premises, or
- (C) otherwise address in a timely manner a failure to comply with the cross-connection control program.

(2) **Cross-Connection Control Program Coordinator** – The PWS must designate at least one individual involved in the development of and be responsible for the reporting, tracking, and other administration duties of its cross-connection control program. For PWS with more than 3,000 service connections the Cross-Connection Control Program Coordinator must be a cross-connection control specialist.

(3) **Hazard Assessments** – The PWS must survey its service area and conduct hazard assessments per Article 2 of this Chapter that identifies actual or potential cross-connection hazards, degree of hazard, and any backflow protection needed.

(4) **Backflow Prevention** – The PWS must ensure that actual and potential cross-connections are eliminated when possible or controlled by the installation of approved BPAs or AG's consistent with the requirements of the Article 3 of this Chapter.

(5) **Certified Backflow Prevention Assembly Testers and Certified Cross-Connection Control Specialists** – The PWS must ensure all BPA testers and cross-connection control specialists used are certified per Article 4 of this Chapter.

(6) **Backflow Prevention Assembly Testing** – The PWS must develop and implement a procedure for ensuring all BPAs are field tested, inspected, and maintained and AG's are inspected and maintained in accordance with CCCPH section 3.3.3.

(7) **Recordkeeping** – The PWS must develop and implement a recordkeeping system in accordance with CCCPH section 3.5.1.

(8) **Backflow Incident Response, Reporting and Notification** – The PWS must develop and implement procedures for investigating and responding to suspected or actual backflow incidents in accordance with Article 5 of this chapter.

(9) **Public Outreach and Education** – The PWS must implement a cross-connection control public outreach and education program element that includes educating staff, customers, and the community about backflow protection and cross-connection control. The PWS may implement this requirement through a variety of methods which may include providing information on cross-connection control and backflow protection in periodic water bill inserts, pamphlet distribution, new customer documentation, email, and consumer confidence reports.

(10) **Local Entity Coordination** – The PWS must coordinate with applicable local entities that are involved in either cross-connection control or public health protection to ensure hazard assessments can be performed, appropriate backflow protection is provided, and provide assistance in the investigation of backflow incidents. Local entities may include but are not limited to plumbing, permitting, or health officials, law enforcement, fire departments, maintenance, and public and private entities.

(b) The cross-connection control program must be developed in consultation with a cross-connection control specialist if:

(1) The PWS has 1,000 or more service connections, or

(2) required by the State Water Board.

(c) A PWS must have at least one cross-connection control specialist as a permanent or contracted employee of the PWS, and that specialist, or their designee, must be able to be contacted within one hour, if:

(1) The PWS has 3,000 or more service connections, or

(2) the PWS has less than 3,000 service connections and is directed by the State Water Board based on hazard assessments conducted pursuant to CCCPH section 3.2.1. or the PWS's history of backflow incidents.

3.1.4 Plan for Public Water System Cross-Connection Control

(a) After adoption of the CCCPH, each PWS must submit a written Cross-Connection Control Plan for State Water Board review in accordance with the following schedule:

- (1) An Existing PWS must submit the Cross-Connection Control Plan no later than 12 months after the effective date of the CCCPH.
- (2) A new PWS must submit the Cross-Connection Control Plan for review and approval prior to issuance of a domestic water supply permit.
- (3) A PWS may submit a written request to the State Water Board for an extension of the deadline for submittal of its initial Cross-Connection Control Plan. The PWS's application must include a written description of the need for an extension. Approval of an extension will be at the sole discretion of the State Water Board.

(b) The Cross-Connection Control Plan for a community water system must include, at a minimum, the following cross-connection control program procedures and documentation:

- (1) a description of how the community water system will achieve and maintain compliance with each requirement in this Chapter;
- (2) a description of the process, personnel, and timeframes for completing initial and ongoing hazard assessments pursuant to CCCPH section 3.2.1;
- (3) a description of the legal authority pursuant to CCCPH section 3.1.3 to implement corrective actions in the event a water user fails to comply in a timely manner with the provisions of the PWS's cross-connection control program;
- (4) a description of the process and timeframes for ensuring each BPA is inspected and field tested, and AG is inspected, at a frequency no less than required by this Chapter;
- (5) a description of the process and timeframe for ensuring each non-testable backflow preventer that is under the PWS ownership or administration is installed and maintained according to the California Plumbing Code;
- (6) a description of the process for ensuring individuals field testing and inspecting BPAs are no less qualified than required by this Chapter, including but not limited to confirmation of the individual's:
 - (A) certification as a backflow prevention assembly tester,
 - (B) field test kit or gage equipment accuracy verification, and
 - (C) BPA field test result reports;
- (7) a description of the procedures and timeframes of activities for responding to backflow incidents, including notification of customers, and reporting of backflow incidents pursuant to CCCPH section 3.5.2;
- (8) contact information for cross-connection control personnel including any cross-connection control program coordinator and specialist;
- (9) a description of the tracking system that maintains current and relevant information, including:

- (A) recordkeeping information required pursuant to CCCPH section 3.5.1,
- (B) location and type of each BPA, and
- (C) highest threat potential hazard from which a given BPA is protecting the public water system distribution system;

(10) for user supervisors, if used, the required information pursuant to CCCPH section 3.2.2 (f);

(11) the corrective actions, including timeframes for the corrective actions, that a community water system will implement when:

- (A) a cross-connection exists and the BPA installed is not commensurate with the user premises' hazard or no BPA has been installed, or
- (B) a BPA needs to be replaced or maintained;

(12) a description of the public outreach and education program to comply with CCCPH section 3.1.3(a)(9); and

(13) the procedures for coordination with local entities

(c) The Cross-Connection Control Plan for a noncommunity water system must include, at a minimum, the following cross-connection control program procedures and documentation:

(1) a description of how the noncommunity water system will achieve and maintain compliance with each requirement in this Chapter that is applicable to the noncommunity water system;

(2) a description of the process, personnel, and timeframes for completing initial and ongoing hazard assessments pursuant to CCCPH section 3.2.1;

(3) a description of the legal authority pursuant to CCCPH section 3.1.3 to implement corrective actions in the event a water user fails to comply in a timely manner with the provisions of the PWS's cross-connection control program;

(4) a description of the process and timeframes for ensuring each BPA is inspected and field tested and AG is inspected, at a frequency no less than required by this Chapter;

(5) a description of the process and timeframe for ensuring each non-testable backflow preventer for internal protection that is under the PWS ownership or administration is installed and maintained according to the California Plumbing Code;

(6) a description of the process for ensuring individuals field testing and inspecting BPAs are no less qualified than required by this Chapter, including but not limited to confirmation of the individual's:

- (A) certification as a backflow prevention assembly tester,
- (B) field test kit or gage equipment accuracy verification, and
- (C) BPA field test result reports;

(7) a description of the procedures and timeframes of activities for responding to backflow incidents, including notification of customers, and reporting of backflow incidents pursuant to CCCPH section 3.5.2;

(8) contact information for cross-connection control personnel including the cross-connection control program coordinator;

(9) maintaining a tracking system with current and relevant information, including:

(A) recordkeeping information required pursuant to CCCPH section 3.5.1,

(B) location and type of each BPA,

(C) location and type of each non-testable backflow preventer used for internal protection in accordance with the California Plumbing Code, if applicable, and

(D) potential hazard from which a BPA is protecting the public water system distribution system;

(10) for user supervisors, if used, the required information pursuant to CCCPH section 3.2.2(f);

(11) the corrective actions, including timeframes for the corrective actions, that a noncommunity water system will implement when:

(A) a cross-connection exists and the BPA installed is not commensurate with the user premises' hazard or no BPA has been installed, or

(B) a BPA or non-testable backflow preventer needs to be replaced or maintained;

(12) a description of the public outreach and education program to comply with CCCPH section 3.1.3(a)(9); and,

(13) the procedures for coordination with local entities (e.g., local health departments with internal cross-connection control programs, building officials, plumbing officials, etc.).

(d) A PWS must ensure its Cross-Connection Control Plan is, at all times, representative of the current operation of its Cross-Connection Control program. The PWS must make its Cross-Connection Control Plan available to the State Water Board for review upon request. If a PWS makes a substantive revision to its Cross-Connection Control Plan, the PWS must submit the revised Cross-Connection Control Plan to the State Water Board for review.

Article 2 – Hazard Assessments and Required Protection

3.2.1 Hazard Assessments

(a) To evaluate the potential for backflow into the PWS, each community water system must conduct an initial hazard assessment of the user premises within its service area and each noncommunity water system must conduct an initial hazard assessment of its water distribution system. The hazard assessment must consider:

- (1) The existence of cross-connections;
- (2) the type and use of materials handled and present, or likely to be, on the user premises;
- (3) the degree of piping system complexity and accessibility;
- (4) access to auxiliary water supplies, pumping systems, or pressure systems;
- (5) distribution system conditions that increase the likelihood of a backflow event (e.g., hydraulic gradient differences impacted by main breaks and high water-demand situations, multiple service connections that may result in flow-through conditions, etc.);
- (6) user premises accessibility;
- (7) any previous backflow incidents on the user premises; and
- (8) the requirements and information provided in the CCCPH.

(b) Each hazard assessment must identify the degree of hazard to the PWS's distribution system as either a high hazard cross-connection, a low hazard cross-connection, or having no hazard. Examples of some high hazard cross-connection activities may be found in Appendix D.

(c) The hazard assessment must determine whether an existing BPA, if any, provides adequate protection based on the degree of hazard.

(d) Hazard assessments completed prior to the adoption of the CCCPH may be considered as an initial hazard assessment provided that such hazard assessments and associated backflow protection provide protection consistent with the CCCPH and the PWS describes their review of these assessments in the Cross-Connection Control Plan required in CCCPH section 3.1.4.

(e) Subsequent to the initial hazard assessment described in subsection (a), a community water system must perform a hazard assessment under the following criteria:

- (1) if a user premises changes account holder, excluding single-family residences;
- (2) if a user premises is newly or re-connected to the PWS;
- (3) if evidence exists of changes in the activities or materials on a user's premises;
- (4) if backflow from a user's premises occurs;
- (5) periodically, as identified in the PWS's Cross-Connection Control Plan required pursuant to CCCPH section 3.1.4.;

- (6) if the State Water Board requests a hazard assessment of a user's premises;
and
- (7) if the PWS concludes an existing hazard assessment may no longer accurately represent the degree of hazard.

(f) Noncommunity water systems must conduct an initial or follow-up hazard assessment within two years of the adoption of the CCCPH.

(g) Noncommunity water system must conduct a follow-up hazard assessment of its water distribution system if any changes are made that could result in a cross-connection or any backflow incidents occur.

(h) A cross-connection control specialist must review or conduct each initial and follow-up hazard assessment pursuant to this section and make a written finding that, in the specialist's judgment based on cross-connection control principles, the PWS's hazard assessment properly identified all hazards at the time of the assessment, the appropriate degree of hazards, and the corresponding backflow protection.

3.2.2 Backflow Protection Required

(a) A PWS must ensure its distribution system is protected from backflow from identified hazards through the proper installation, continued operation, and field testing of an approved BPA (see Article 3 for installation and approved BPA criteria). When a DC is required or referenced in the CCCPH, a DCDA or DCDA-II type of assembly may be substituted if appropriate. When an RP is required or referenced in the CCCPH, an RPDA or RPDA-II type of assembly may be substituted if appropriate.

(b) The BPA installed must be no less protective than that which is commensurate with the degree of hazard at a user premises, as specified in this Chapter and as determined based on the results of the hazard assessment conducted pursuant to CCCPH section 3.2.1.

(c) Unless specified otherwise in this Chapter, a PWS must, at all times, protect its distribution system from high hazard cross-connections (see Appendix D for examples), through premises containment, through the use of AG(s) or RP(s).

- (1) Following State Water Board review and approval, a PWS may implement an alternate method of premises containment in lieu of a required AG provided that the proposed alternative would not increase the level of risk to protection of public health.

- (2) Following State Water Board review and approval, a PWS may accept internal protection in lieu of containment when premises containment is not feasible.

(d) Except as otherwise allowed or prohibited in statute or in CCR Title 22, Division 4, Chapter 3, a swivel-ell may be used instead of an AG for premises containment protection when temporarily substituting tertiary recycled water use areas with potable water from a PWS if all the following criteria are met:

- (1) the swivel-ell is approved by the State Water Board;
- (2) the PWS has a cross-connection control program, required pursuant to CCCPH section 3.1.3, and the use and operation of the swivel-ell is described in the Cross-Connection Control Plan required pursuant to CCCPH section 3.1.4;
- (3) the design and construction-related requirements of the swivel-ell adheres to the criteria in Appendix C;
- (4) at least every 12 months, inspections are performed and documented to confirm ongoing compliance with the design and construction-related requirements in Appendix C;
- (5) the RP used in conjunction with the swivel-ell is field tested and found to be functioning properly:

- (A) immediately upon each switchover to potable water use, a visual inspection of the RP must be completed
- (B) within 72 hours of each switchover to potable water use, a field test must be completed, and
- (C) at least every 12 weeks the use site is supplied with potable water; and

(6) there is a legally binding agreement between the PWS and the entity supplying the recycled water, signed by those with relevant legal authority, that includes the following requirements:

- (A) The State Water Board will be notified within 24 hours of all switchovers to or from potable water, will be given an estimate of the timeframe until the next switchover, and will be provided the results of the field testing required in paragraph (5);
- (B) a trained representative of the PWS be present to supervise each switchover; and
- (C) within seven days of each switchover, if requested by the State Water Board, the PWS will submit a written report describing compliance with this subsection, as well as potable and recycled water usage information.

(e) Except as noted below, a PWS must ensure its distribution system is protected with no less than DC protection for a user premises with a fire protection system within ten years of adoption of the CCCPH.

- (1) A high hazard cross-connection fire protection system, including but not limited to fire protection systems that may utilize chemical addition (e.g., wetting agents, foam, anti-freeze, corrosion inhibitor, etc.) or an auxiliary water supply, must have no less than RP protection.

(2) For existing fire protection systems that do not meet Section 3.2.2 (e)(3) or cannot install DC protection within ten years of adoption of the CCCPH, a PWS may propose in the cross-connection control plan submitted for CCCPH Section 3.1.4:

- (A) an alternative date; or
- (B) an alternative method of backflow protection that provides at least the same level of protection to public health.

(3) A BPA is not necessary for a low hazard fire protection system on a residential user premises if the following criteria are satisfied:

- (A) the user premises has only one service connection to the PWS;
- (B) a single service line onto the user premises exists that subsequently splits on the property for domestic flow and fire protection system flow, such that the fire protection system may be isolated from the rest of the user premises;
- (C) a single, water industry standard, water meter is provided to measure combined domestic flow and fire protection system flow;
- (D) the fire protection system is constructed of piping materials certified as meeting NSF/ANSI Standard 61; and
- (E) the fire protection system's piping is looped within the structure and is connected to one or more routinely used fixtures (such as a water closet) to prevent stagnant water.

(f) The State Water Board and PWS may, at their discretion, require a water user to designate a user supervisor when the user premises has a multi-piping system that conveys various types of fluids and where changes in the piping system are frequently made. If a user supervisor is designated the following is required:

- (1) The user supervisor is responsible for the avoidance of cross-connections during the installation, operation and maintenance of the water user's pipelines and equipment. The user supervisor must be trained on the fluids used and backflow protection for the premise, and must inform the PWS of changes in piping, and maintain current contact information on file with the PWS; and
- (2) The PWS must include in the Cross-Connection Control Plan required in CCCPH section 3.1.4 the training and qualification requirements for user supervisors, identify the entity that will provide the user supervisor training, and frequency of any necessary recurring training. The training must adequately address the types of hazards and concerns typically found.

(g) Facilities producing, treating, storing, or distributing drinking water that are an approved water supply or water recycling plants as defined by CCR Title 22, Section 60301.710 must have proper internal protection from cross-connections to ensure that all drinking water produced and delivered to customers and workers at those facilities is free from unprotected cross-connections.

Article 3 – Backflow Prevention Assemblies

3.3.1 Standards for Types of Backflow Protection

(a) The PWS must ensure that each AG used for its Cross-Connection Control Program meets the requirements in Table 1, Minimum Air Gaps for Generally used Plumbing Fixtures, page 4 of the American Society of Mechanical Engineers (ASME) A112.1.2-2012(R2017) (See Appendix B).

(b) The PWS must ensure that each replaced or newly installed PVB, SVB, DC, and RP for protection of the PWS is approved through both laboratory and field evaluation tests performed in accordance with at least one of the following:

- (1) Standards found in Chapter 10 of the *Manual of Cross-Connection Control, Tenth Edition*, published by the University of Southern California Foundation for Cross-Connection Control and Hydraulic Research; or
- (2) certification requirements for BPAs in the Standards of ASSE International current as of 2022 that include ASSE 1015-2021 for the DC, ASSE 1048-2021 for the DCDA & DCDA-II, ASSE 1013-2021 for the RP, and ASSE 1047-2021 for the RPDA & RPDA-II and must have the 1YT mark.

(c) BPAs must not be modified following approval granted under section 3.3.1 (b). PWS must require BPA testers to notify the PWS if a water user or PWS-owned BPA has been modified from the CCCPH section 3.3.1 (b) approval.

3.3.2 Installation Criteria for Backflow Protection

(a) For AGs, the following is required:

- (1) The receiving water container must be located on the water user's premises at the water user's service connection unless an alternate location has been approved by the PWS;
- (2) all piping between the water user's service connection and the discharge location of the receiving water container must be above finished grade and be accessible for visual inspection unless an alternative piping configuration is approved by the PWS;
- (3) the PWS must ensure that the AG specified in CCCPH section 3.3.1 (a) has been installed; and
- (4) any new air gap installation at a user's service connection must be reviewed and approved by the State Water Board prior to installation.

(b) RPs must be installed such that the lowest point of an assembly is a minimum of twelve inches above grade, and a maximum of thirty-six inches above the finished grade, unless an alternative is approved by the PWS.

(c) DCs installed or replaced after the adoption of the CCCPH must be installed according to CCCPH section 3.3.2 (b). Below ground installation can be considered if approved by the PWS where it determines no alternative options are available.

(d) A PVB or SVB must be installed a minimum of twelve inches above all downstream piping and outlets.

(e) SVBs may not be used for premises containment. PVBs may only be used for roadway right of way irrigation systems as premises containment where there is no potential for backpressure.

(f) A RP or DC installed after the adoption of the CCCPH must have a minimum side clearance of twelve inches, except that a minimum side clearance of twenty-four inches must be provided on the side of the assembly that contains the test cocks. The PWS may approve alternate clearances providing that there is adequate clearance for field testing and maintenance.

(g) Backflow protection must be located as close as practical to the water user's service connection unless one or more alternative locations have been approved by the PWS. If internal protection is provided in lieu of premises containment, the PWS must obtain access to the user premises and must ensure that the on-site protection meets the requirements of this Chapter for installation, field testing, and inspections.

(h) Each BPA and air gap separation must be accessible for field testing, inspection, and maintenance.

3.3.3 Field Testing and Repair of Backflow Prevention Assemblies and Air Gap Inspection

(a) PWS must ensure that all BPAs installed for its Cross-Connection Control Program are field tested following installation, repair, depressurization for winterizing, or permanent relocation. All required field testing must be performed by certified backflow prevention assembly testers.

(b) BPAs must be field tested at least annually. The CCCPH does not preclude a PWS, the State Water Board, or a local health agency from requiring more frequent field testing for premises with high hazard cross-connection or BPA at increased risk of testing failure.

(c) Air-gap separations must be visually inspected at least annually to determine compliance with this Chapter by persons certified as backflow prevention assembly testers or certified as a cross-connection control specialist pursuant to this Chapter.

(d) PWS must receive passing field tests before providing continuous service to a water user with a newly installed BPA.

(e) PWS must ensure that BPAs that fail the field test are repaired or replaced within 30 days of notification of the failure. Extensions may be allowed by the PWS if included as part of the Cross-Connection Control Plan.

(f) PWS must require backflow prevention assembly testers to notify the PWS as soon as possible within 24 hours if a backflow incident or an unprotected cross-connection is observed at the BPA or prior to the user premises during field testing. PWS must immediately conduct an investigation and discontinue service to the user premises if a backflow incident is confirmed, and water service must not be restored to that user premises until the PWS receives a confirmation of a passing BPA field test from a backflow prevention assembly tester and the assembly is protecting the PWS.

Article 4 – Backflow Prevention Assembly Testers and Cross-Connection Control Specialists

3.4.1 Backflow Prevention Assembly Tester Certification

(a) A PWS must ensure that each BPA required by this Chapter to protect the public water system is field tested by a person with valid certification from a certifying organization recognized by the State Water Board pursuant to this Article.

(b) A State Water Board-recognized organization certifying backflow prevention assembly testers is one that has a certification process that, at a minimum, includes the following:

(1) A timed and proctored written⁶ exam, using a closed-book, objective grading format, consisting of no less than 100 questions for initial certification and no less than 50 questions for recertification. A passing score must be achieved by an examinee as a requirement for certification.

(A) Written exam proctors must:

1. not provide an examinee any assistance in answering exam questions, verbal or otherwise; and
2. be impartial.

(B) Passing scores for the written exams are to be determined prior to exam sessions, such that passing a written exam demonstrates sufficient knowledge of subjects associated with the proper field testing of BPAs, including but not limited to:

1. the hydraulics and theory of backflow;
2. California's laws, regulations, and requirements related to cross-connection control;
3. types of BPA field test equipment and the need to verify accuracy, at least annually and when otherwise necessary, to ensure accuracy of field test results;
4. field test procedures for an RP, RPDA, RPDA-II, DC, DCDA, DCDA-II, PVB, and SVB using the procedures provided in the *Manual of Cross-Connection Control, Tenth Edition*, published by the University of Southern California Foundation for Cross-Connection Control and Hydraulic Research or equivalent;
5. identification of improperly functioning BPAs (i.e., diagnostics or troubleshooting); and
6. recordkeeping and safety.

⁶ The requirement for a written exam does not preclude using computerized exams.

(2) A performance (i.e., hands-on) exam, using a closed-book, objective grading process and the field test procedures in paragraph (1)(B)(4), designed such that passing the performance exam demonstrates proficiency in accurately determining the operating condition of an RP, DC, PVB, and SVB, when properly or improperly functioning, including but not limited to BPAs with leaks in shutoff valves, and failures in check valves, air inlet valves, or relief valves. A passing score must be achieved by an examinee as a requisite for certification. The performance exam process must include the following:

(A) Performance exam proctors must:

1. be certified as a backflow prevention assembly tester pursuant to this Article;
2. evaluate no more than one examinee at a time;
3. not provide an examinee any assistance in answering exam questions, verbal or otherwise;
4. provide no indication an examinee has erred until completion of a BPA field test, at which time only the fact the examinee has erred may be indicated (i.e., not the nature of the error);
5. be impartial and not affiliated with the certifying organization's preparation of, or preparatory course for (if applicable), the performance exam; and
6. not evaluate an examinee who was trained by the proctor during the six-month period prior to the exam or other conflict of interest.

(B) An examinee is considered to have failed a performance exam if the examinee:

1. makes a field test procedure or recording error that could impact an accurate determination of the operating condition of a BPA,
2. completes the BPA performance exam form with an error,
3. is informed of making an error (see subparagraph (A)(4)) and begins the procedure a second time, and
4. errs a second time and completes the BPA performance exam form accordingly.

(3) recertification requirements of no less frequently than every three years which includes both a written and performance exam;

(4) provisions for revocation of a backflow prevention assembly tester's certification, including but not limited to, revocation for falsifying field test results or field test reports;

(5) a website providing public access to the most recent list of backflow prevention assembly testers:

- (A) who hold a valid certification from the certifying organization. At a minimum, the list is to include each backflow prevention assembly tester's last name, first name, certification number, and the date on which each backflow prevention assembly tester's certification expires; and
- (B) whose certification was revoked, pursuant to paragraph (4), in the three years preceding the date of the list. At a minimum, the list is to include each backflow prevention assembly tester's last name, first name, revoked certification number, the date on which each backflow prevention assembly tester's certification was revoked, and the reason for revocation.

(6) as a prerequisite to sections 3.4.1(b)(1) and (b)(2), completion of an instructional training course accepted by the certifying organization⁷ that covers the subjects in subsection (1)(B) and is no less than 30 hours in length over no fewer than four days for:

- (A) a backflow prevention assembly tester's initial certification;
- (B) a backflow prevention assembly tester's recertification as a result of revocation; or

(7) In lieu of compliance with section 3.4.1(b)(6) a certifying organization may accept two years prior experience in backflow prevention assembly testing.

(c) To be recognized by the State Water Board as a certifying organization for backflow prevention assembly testers, a certifying organization shall:

(1) submit an application with the following information to the State Water Board for review:

- (A) written documentation of a certification program that includes a process that is no less stringent than the criteria in subsection (b);
- (B) evidence that the organization's certification program and exam process has been reviewed, with concerns adequately addressed, by a credentialed psychometrician proficient in the design of objective exams, experienced in the assessment of certification or licensing organizations, and familiar with the application of the requirements of *ISO⁸/IEC⁹ 17024: Conformity Assessment- General Requirements for Bodies Operating Certification of Persons*; and

⁷ But not limited only to training provided by the certifying organization or its affiliates.

⁸ International Organization for Standardization

⁹ International Electrotechnical Commission

(C) a written statement, signed by the certifying organization's representative(s) having the authority and legal responsibility for operation of the certifying organization, attesting that the certifying organization will implement its certification program in a manner meeting or exceeding the criteria in subsection (b) and consistent with the application submitted to the State Water Board.

(2) adequately address each State Water Board comment and/or question concerning the application, and

(3) receive written acknowledgment from the State Water Board that the application is complete.

(d) An American National Standards Institute (ANSI)-accredited certifying organization, accredited in accordance with subsection (b) and ISO/IEC 17024, will be considered to be a State Water Board-recognized certifying organization. Beginning three years after the effective date of the CCCPH, only those testers with a valid certification from an ANSI-accredited certifying organization shall satisfy subsection (a) and certifications obtained by organizations in accordance with subsection (c) will be invalid.

(e) This Article does not preclude a local health agency from maintaining a backflow prevention assembly tester certification program for the field testing of BPAs within the local health agency's jurisdiction. Accepting a tester certified by a local health agency does not relieve a PWS from meeting the requirements of this Article.

(f) This Article does not preclude a PWS from disallowing the use of an individual tester certified pursuant to this Article if the PWS has reason to believe a certified tester may not be proficient in accurately determining the operating condition of BPA, or for any other reason (e.g., fraud, deceit, negligence, misconduct, etc.). A PWS must report any evidence of a tester falsifying reports to that tester's certifying organization.

(g) This Article is effective July 1, 2025.

3.4.2 Cross-Connection Control Specialist Certification

(a) A PWS must ensure that cross-connection control specialists, used pursuant to the CCCPH, have valid certification from a certifying organization recognized by the State Water Board pursuant to this Article.

(b) A State Water Board-recognized organization certifying cross-connection control specialists is one that has a certification process that, at a minimum, includes the following:

(1) A timed and proctored, written¹⁰ exam, using a closed-book, objective grading format, consisting of no less than 100 questions for certification. A passing score must be achieved by an examinee as a requirement for certification.

(A) Written exam proctors must:

1. not provide an examinee any assistance in answering exam questions, verbal or otherwise; and
2. be impartial.

(B) Passing scores for the exams are to be determined prior to exam sessions, such that passing an exam demonstrates sufficient and comprehensive range of knowledge of the subjects provided in Appendix E, as they may relate to cross-connection control and the causes, effects, and prevention of backflow.

(2) recertification requirements of no less frequently than every three years. Recertification may be done through at least one of the following:

- (A) an exam as required by section 3.4.2 (b)(1),
- (B) through 12 contact hours from continuing education courses covering material in Appendix E or,
- (C) a combination of exam and continuing education contact hours equivalent to (A) or (B);

(3) provisions for revocation of a specialist's certification, including but not limited to, falsifying information or providing negligent recommendations inconsistent with industry-standard cross-connection control guidelines;

(4) a website providing public access to the most recent list of cross-connection control specialists:

(A) who hold a valid certification from the certifying organization. At a minimum, the list is to include each specialist's last name, first name, certification number, and the date on which each specialist's certification expires; or

¹⁰ The requirement for a written exam does not preclude using computerized exams.

(B) whose certification was revoked, pursuant paragraph (3), in the three years preceding the date of the list. At a minimum, the list is to include each specialist's last name, first name, revoked certification number, the date on which each specialist's certification was revoked, and the reason for revocation.

(5) initial certification requirements:

(A) a valid backflow prevention assembly tester certification from a certification organization recognized by the State Water Board pursuant to section 3.4.1; and

(B) completion of an instructional training course (acceptable to the certifying organization¹¹) that covers the subjects in Appendix E and is no less than 30 hours in length over no fewer than five days (inclusive of an exam, if provided). This paragraph does not preclude a certification organization from providing the instructional training course to the public, including certified specialists.

(C) As an alternative to (A) the certifying organization may accept additional instruction in the subject areas of testing, maintaining and repairing BPAs equivalent in length and scope to the requirements in 3.4.1(b)(6).

(D) As an alternative to (A) the certifying organization may accept a minimum of five (5) years documented experience performing cross-connection control specialist duties, as outlined in Appendix E.

(c) To be recognized by the State Water Board as a certifying organization for cross-connection control specialists, a certifying organization shall:

(1) submit an application with the following information to the State Water Board for review:

(A) Written documentation of a certification program that includes a process that is no less stringent than the criteria in subsection (b);

(B) evidence that the organization's certification program and exam process has been reviewed, with concerns adequately addressed, by a credentialed psychometrician proficient in the design of objective exams, experienced in the assessment of certification or licensing organizations, and familiar with the application of the requirements of *ISO*¹²/*IEC*¹³ 17024: *Conformity Assessment- General Requirements for Bodies Operating Certification of Persons*; and

¹¹ But not limited only to training provided by the certifying organization or its affiliates.

¹² International Organization for Standardization

¹³ International Electrotechnical Commission

(C) a written statement, signed by the certifying organization's representative(s) having the authority and legal responsibility for operation of the certifying organization, attesting that the certifying organization will implement its certification program in a manner meeting or exceeding the criteria in subsection (b) and consistent with the application submitted to the State Water Board.

(2) adequately address each State Water Board comment and question concerning the application, and

(3) receive a written acknowledgment from the State Water Board that the application is complete:

(d) A certifying organization, accredited by the American National Standards Institute (ANSI) in accordance with ISO/IEC 17024, which complies with subsection (b), will be considered to be a State Water Board-recognized certifying organization. Beginning three years after the effective date of the CCCPH, only those specialists with a valid certification from an ANSI-accredited certifying organization shall satisfy subsection (a) and certifications obtained by organizations in accordance with subsection (c) will be invalid.

(e) This Article does not preclude a local health agency from maintaining a cross-connection control specialist certification program for specialists within the local health agency's jurisdiction. Using a specialist certified by a local health agency does not relieve a PWS from meeting the requirements of this Article.

(f) This Article does not preclude a PWS from disallowing the use of an individual cross-connection control specialist certified pursuant to this Article if the PWS has reason to believe a certified specialist may not be proficient in their knowledge of cross-connection control and the causes, effects, and prevention of backflow, or for any other reason (e.g., fraud, deceit, negligence, misconduct, etc.). A PWS must report any evidence of a specialist falsifying reports to that specialist's certifying organization.

(g) This Article is effective July 1, 2025.

Article 5 – Recordkeeping, Backflow Incident Response, and Notification

3.5.1 Recordkeeping

(a) Each PWS must maintain the following records:

- (1) The two most recent hazard assessments for each user premise, conducted pursuant to CCCPH section 3.2.1 (Hazard Assessment);
- (2) for each BPA, the associated hazard or application, location, owner, type, manufacturer and model, size, installation date, and serial number;
- (3) for each AG installation, the associated hazard or application and the location, owner, and as-built plans of the AG;
- (4) results of all BPA field testing, AG inspection, and swivel-ell inspections and field tests for the previous three calendar years, including the name, test date, repair date, and certification number of the backflow prevention assembly tester for each BPA field test and AG and swivel-ell;
- (5) repairs made to, or replacement or relocation of, BPAs for the previous three calendar years;
- (6) the most current cross-connection tests (e.g. shutdown test, dye test);
- (7) if a user supervisor is designated for a user premise, the current contact information for the user supervisor and water user, and any applicable training and qualifications as described by CCCPH section 3.2.2(f);
- (8) descriptions and follow-up actions related to all backflow incidents;
- (9) if any portion of the cross-connection control program is carried out under contract or agreement, a copy of the current contract or agreement;
- (10) the current Cross-Connection Control Plan as required in CCCPH section 3.1.4.; and
- (11) any public outreach or education materials issued as required in CCCPH section 3.1.3.(a)(9) for the previous three calendar years.

(b) All information in subsection (a) must be available to the State Water Board upon request.

3.5.2 Backflow Incident Response Procedure

Each PWS must include backflow incident response procedures in the Cross-Connection Control Plan required in CCCPH section 3.1.4. The PWS must describe its procedures for investigating and responding to suspected backflow incidents including, but not limited to, the following:

(a) Consideration of complaints or reports of changes in water quality as possible incidents of backflow;

(b) Water quality sampling and pressure recording; and

(c) Documentation of the investigation, and any response and follow-up activities.

3.5.3 Backflow Incident Notification

(a) Each PWS must notify the State Water Board and local health agencies of any known or suspected incident of backflow within 24 hours of the determination. If required by the State Water Board, a PWS must issue a Tier 1 public notification pursuant to CCR, Title 22, Section 64463.1.

(b) If required by the State Water Board, the PWS must submit, by a date specified by the State Water Board, a written incident report describing the details and affected area of the backflow incident, the actions taken by the PWS in response to the backflow incident, and the follow up actions to prevent future backflow incidents. The written report must contain, at a minimum, the information requested in Appendix F.

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Appendix

Appendix A: Assembly Bill 1671 (2017, Chapter 533) and Assembly Bill 1180 (2019, Chapter 455).

Appendix B: ASME A112.1.2-2012(R2017) Table 1, Minimum Air Gaps for Generally used Plumbing Fixtures, page 4

Appendix C: Backflow Prevention Assembly Diagrams

Appendix D: High Hazard Premises

Appendix E: General Range of Knowledge for Cross-Connection Control Specialists

Appendix F: Example Backflow Incident Reporting Form

Appendix G: Related Statutes and Regulations

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Appendix A

Assembly Bill 1671 (2017, Chapter 533)
Assembly Bill 1180 (2019, Chapter 455)

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Assembly Bill No. 1671

CHAPTER 533

An act to amend Section 116810 of, and to add Sections 116407 and 116555.5 to, the Health and Safety Code, relating to drinking water.

[Approved by Governor October 6, 2017. Filed with
Secretary of State October 6, 2017.]

LEGISLATIVE COUNSEL'S DIGEST

AB 1671, Caballero. Backflow protection and cross-connection controls: standards.

(1) Existing law, the California Safe Drinking Water Act, requires the State Water Resources Control Board to administer provisions relating to the regulation of drinking water to protect public health, including, but not limited to, conducting research, studies, and demonstration projects relating to the provision of a dependable, safe supply of drinking water, enforcing the federal Safe Drinking Water Act, adopting regulations, and conducting studies and investigations to assess the quality of private domestic water wells. Existing law makes certain violations of the act a misdemeanor.

Existing law requires any person who owns a public water system to ensure that the system does certain things, including, but not limited to, that it will not be subject to backflow under normal operating conditions. Existing law, to ensure that testing and maintenance of backflow prevention devices are performed by persons qualified to do testing and maintenance, authorizes local health officers to maintain programs for certification of backflow prevention device testers and requires the certification program to be consistent with backflow protection regulations adopted by the state board. A violation of these provisions, or an order by a local health officer pursuant to these provisions, is a misdemeanor.

This bill would require a public water system to implement a cross-connection control program that complies with, and would require the certification program to be consistent with, applicable regulations and the standards described in (2).

(2) Existing regulations establish standards for a backflow prevention device and cross-connection control.

This bill, on or before January 1, 2020, would require the state board to adopt standards for backflow protection and cross-connection control and would authorize the state board to do so through the adoption of a policy handbook, as specified. By authorizing the state board to adopt standards, the violation of which would be a crime, the bill would create a new crime and impose a state-mandated local program.

(3) The California Constitution requires the state to reimburse local agencies and school districts for certain costs mandated by the state. Statutory provisions establish procedures for making that reimbursement.

This bill would provide that no reimbursement is required by this act for a specified reason.

The people of the State of California do enact as follows:

SECTION 1. Section 116407 is added to the Health and Safety Code, to read:

116407. (a) On or before January 1, 2020, the state board shall adopt standards for backflow protection and cross-connection control.

(b) The state board may implement subdivision (a) through the adoption of a policy handbook that is not subject to the requirements of Chapter 3.5 (commencing with Section 11340) of Part 1 of Division 3 of Title 2 of the Government Code. The policy handbook shall include standards for backflow protection and cross-connection control. In developing the standards and any amendments to those standards, the state board shall consult with state and local agencies and other persons whom the state board has identified as having expertise in the subject of backflow protection and cross-connection control. The state board shall hold at least two public hearings before adopting the policy handbook. The policy handbook shall be posted on the board's Internet Web site.

(c) (1) Upon the effective date of a policy handbook adopted by the state board pursuant to subdivision (b), the regulations set forth in Article 1 (commencing with Section 7583) and Article 2 (commencing with Section 7601) of Group 4 of Subchapter 1 of Chapter 5 of Division 1 of Title 17 of the California Code of Regulations shall become inoperative, and, 90 days thereafter, are repealed, unless the state board makes a determination not to repeal a specific regulation.

(2) If the state board determines not to repeal a specific regulation pursuant to paragraph (1), the state board shall provide to the Office of Administrative Law and the Secretary of State written notice of its determination, including identification of the specific regulation that is not repealed. That regulation, upon the provision of that written notice to the Office of Administrative Law and the Secretary of State, shall become operative.

SEC. 2. Section 116555.5 is added to the Health and Safety Code, to read:

116555.5. A public water system shall implement a cross-connection control program that complies with applicable regulations and with standards adopted by the board pursuant to Section 116407.

SEC. 3. Section 116810 of the Health and Safety Code is amended to read:

116810. To ensure that testing and maintenance of backflow prevention devices are performed by persons qualified to do testing and maintenance,

local health officers may maintain programs for certification of backflow prevention device testers. The local health officer may suspend, revoke, or refuse to renew the certificate of a tester, if, after a hearing before the local health officer or his or her designee, the local health officer or his or her designee finds that the tester has practiced fraud or deception or has displayed gross negligence or misconduct in the performance of his or her duties as a certified backflow prevention device tester. The local health officer may collect fees from certified testers to offset the cost of the certification program provided pursuant to this section. The certification standards shall be consistent with standards adopted by the state board pursuant to Section 116407 and any other applicable backflow protection regulations.

SEC. 4. No reimbursement is required by this act pursuant to Section 6 of Article XIII B of the California Constitution because the only costs that may be incurred by a local agency or school district will be incurred because this act creates a new crime or infraction, eliminates a crime or infraction, or changes the penalty for a crime or infraction, within the meaning of Section 17556 of the Government Code, or changes the definition of a crime within the meaning of Section 6 of Article XIII B of the California Constitution.

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Assembly Bill No. 1180

CHAPTER 455

An act to amend Section 116407 of the Health and Safety Code, and to add Section 13521.2 to the Water Code, relating to water.

[Approved by Governor October 2, 2019. Filed with Secretary of State October 2, 2019.]

LEGISLATIVE COUNSEL'S DIGEST

AB 1180, Friedman. Water: recycled water.

(1) Existing law, the California Safe Drinking Water Act, requires the State Water Resources Control Board to administer provisions relating to the regulation of drinking water to protect public health. Existing law requires, on or before January 1, 2020, the state board to adopt standards for backflow protection and cross-connection control through the adoption of a policy handbook, as specified.

This bill would require that handbook to include provisions for the use of a swivel or changeover device to supply potable water to a dual-plumbed system during an interruption in recycled water service.

(2) Existing law requires the state board to establish uniform statewide recycling criteria for each varying type of use of recycled water where the use involves the protection of public health.

This bill would require the state board, on or before January 1, 2023, as specified, to update the uniform statewide criteria for nonpotable recycled water uses.

The people of the State of California do enact as follows:

SECTION 1. The Legislature finds and declares all of the following:

(a) On December 11, 2018, the State Water Resources Control Board unanimously adopted an amendment to the policy for water quality control for recycled water, which included a goal to increase the use of recycled water in the state from 714,000 acre-feet per year in 2015 to 1,500,000 acre-feet per year by 2020 and 2,500,000 acre-feet per year by 2030.

(b) Section 13521 of the Water Code requires the state board to establish uniform statewide recycling criteria for each varying type of use of recycled water where the use involves the protection of public health.

(c) The regulations establishing the uniform statewide criteria for recycled water uses are set forth in Chapter 3 (commencing with Section 60301.050) of Division 4 of Title 22 of the California Code of Regulations. The regulations that pertain to nonpotable recycled water uses have not been updated since 2000.

(d) The regulations relating to backflow protection and cross-connection control for recycled water are set forth in Article 1 (commencing with Section 7583) and Article 2 (commencing with Section 7601) of Group 4 of Subchapter 1 of Chapter 5 of Division 1 of Title 17 of the California Code of Regulations. These regulations have not been updated since 1987.

(e) Section 1 of Chapter 533 of the Statutes of 2017 (Assembly Bill 1671 of the 2017–18 Regular Session) requires, on or before January 1, 2020, the state board to adopt backflow protection and cross-connection control standards and authorizes their implementation through a policy handbook.

(f) In order to maximize the amount of recycled water California can safely use for beneficial purposes, it is necessary to update the uniform statewide criteria for nonpotable recycled water uses and specify certain associated backflow protection and cross-connection control provisions.

SEC. 2. Section 116407 of the Health and Safety Code is amended to read:

116407. (a) On or before January 1, 2020, the state board shall adopt standards for backflow protection and cross-connection control.

(b) (1) The state board may implement subdivision (a) through the adoption of a policy handbook that is not subject to the requirements of Chapter 3.5 (commencing with Section 11340) of Part 1 of Division 3 of Title 2 of the Government Code. The policy handbook shall include standards for backflow protection and cross-connection control. In developing the standards and any amendments to those standards, the state board shall consult with state and local agencies and other persons whom the state board has identified as having expertise in the subject of backflow protection and cross-connection control. The state board shall hold at least two public hearings before adopting the policy handbook. The policy handbook shall be posted on the board's internet website.

(2) (A) The policy handbook described in this subdivision shall include provisions for the use of a swivel or changeover device to supply potable water to a dual-plumbed system during an interruption in recycled water service.

(B) The use of a swivel or changeover device shall be consistent with any notification and backflow protection provisions contained in the policy handbook.

(c) (1) Upon the effective date of a policy handbook adopted by the state board pursuant to subdivision (b), the regulations set forth in Article 1 (commencing with Section 7583) and Article 2 (commencing with Section 7601) of Group 4 of Subchapter 1 of Chapter 5 of Division 1 of Title 17 of the California Code of Regulations shall become inoperative, and, 90 days thereafter, are repealed, unless the state board makes a determination not to repeal a specific regulation.

(2) If the state board determines not to repeal a specific regulation pursuant to paragraph (1), the state board shall provide to the Office of Administrative Law and the Secretary of State written notice of its determination, including identification of the specific regulation that is not repealed. That regulation, upon the provision of that written notice to the

Office of Administrative Law and the Secretary of State, shall become operative.

SEC. 3. Section 13521.2 is added to the Water Code, to read:

13521.2. (a) On or before January 1, 2023, the state board shall update the uniform statewide criteria for nonpotable recycled water uses established in Chapter 3 (commencing with Section 60301.050) of Division 4 of Title 22 of the California Code of Regulations. The deadline imposed by this section is mandatory only if the Legislature has appropriated sufficient funds, as determined by the executive director of the state board, in the annual Budget Act or otherwise to cover the state board's costs associated with the performance of the duties imposed by this section.

(b) For purposes of the update to the uniform statewide criteria for nonpotable recycled water uses described in subdivision (a), the state board shall adopt a regulation that incorporates by reference the criteria and applicable backflow protection provisions, including the provisions for the use of a swivel or changeover device for dual-plumbed systems, that are contained in the most recently adopted version of the policy handbook adopted pursuant to Section 116407 of the Health and Safety Code and any future versions of the policy handbook.

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Appendix B

ASME A112.1.2-2012(R2017) Table 1,
Minimum Air Gaps for Generally used Plumbing
Fixtures, page 4

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Appendix B
ASME A112.1.2-2012(R2017) Table 1, Minimum Air Gaps for Generally used Plumbing Fixtures,¹ page 4

TABLE 1
Minimum Air Gaps for Generally used Plumbing Fixtures⁴

FIXTURES	WHERE NOT AFFECTED BY SIDEWALLS ¹ (inches)	WHERE AFFECTED BY SIDEWALLS ² (inches)
Effective opening ³ not greater than ½ of an inch in diameter	1	1½
Effective openings ³ not greater than ¾ of an inch in diameter	1½	2¼
Effective openings ³ not greater than 1 inch in diameter	2	3
Effective openings ³ greater than 1 inch in diameter	Two times the diameter of effective opening	Three times the diameter of effective opening

For SI units: 1 inch = 25.4 mm

Notes:

¹ Sidewalls, ribs, or similar obstructions do not affect air gaps where spaced from the inside edge of the spout opening at a distance exceeding three times the diameter of the effective opening for a single wall, or at a distance exceeding four times the effective opening for two intersecting walls.

² Vertical walls, ribs, or similar obstructions extending from the water surface to or above the horizontal plane of the spout opening other than specified in Footnote 1 above. The effect of three or more such vertical walls or ribs has not been determined. In such cases, the air gap shall be measured from the top of the wall.

³ The effective opening shall be the minimum cross-sectional area at the seat of the control valve or the supply pipe or tubing that feeds the device or outlet. Where two or more lines supply one outlet, the effective opening shall be the sum of the cross-sectional areas of the individual supply lines or the area of the single outlet, whichever is smaller.

⁴ Air gaps less than 1 inch (25.4 mm) shall be approved as a permanent part of a listed assembly that has been tested under actual backflow conditions with vacuums of 0 to 25 inches of mercury (85 kPa).

¹ Reprinted from ASME A112.1.2-2012(R2017), by permission of The American Society of Mechanical Engineers. All rights reserved

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Appendix C

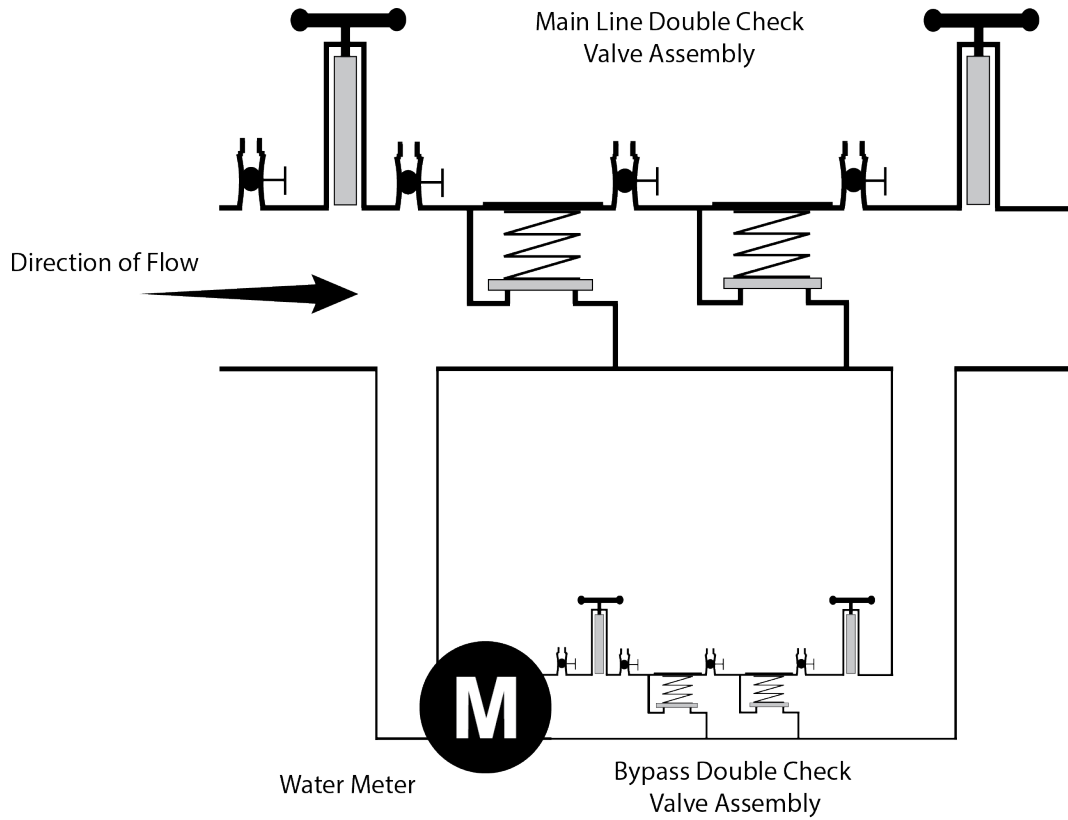
Backflow Prevention Assembly Diagrams

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Appendix C

Diagram 1

Double check detector backflow prevention assembly¹

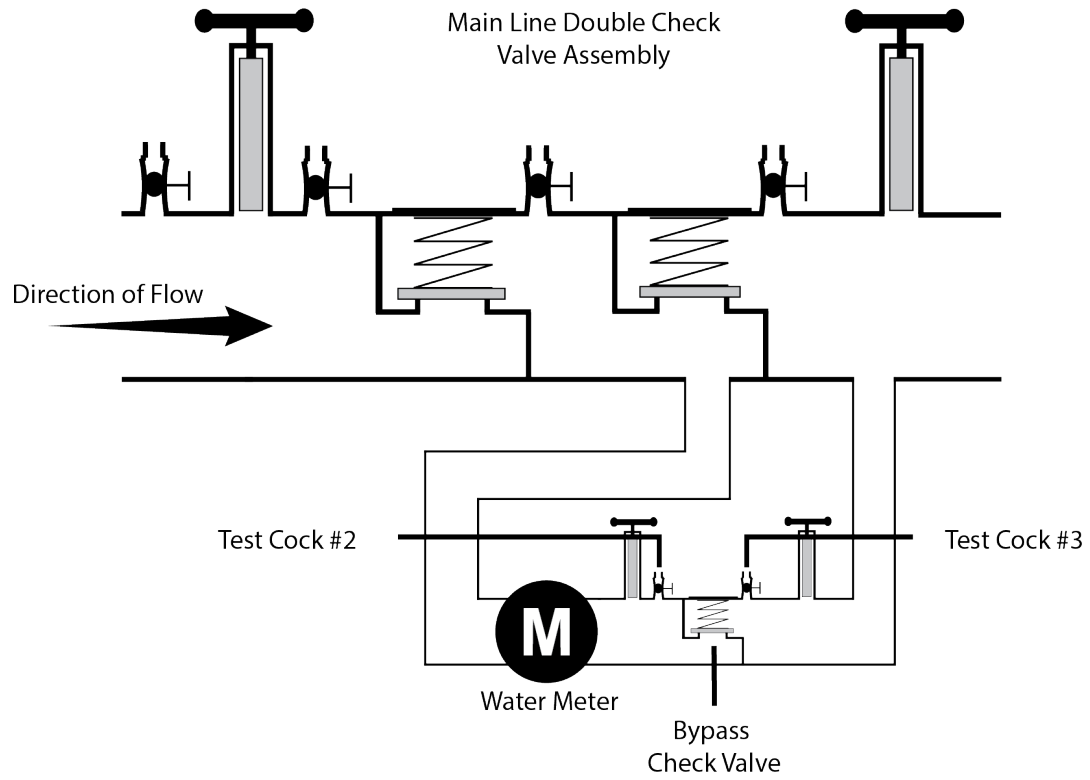


¹ © 2023 University of Southern California. Used with permission.

Appendix C

Diagram 2

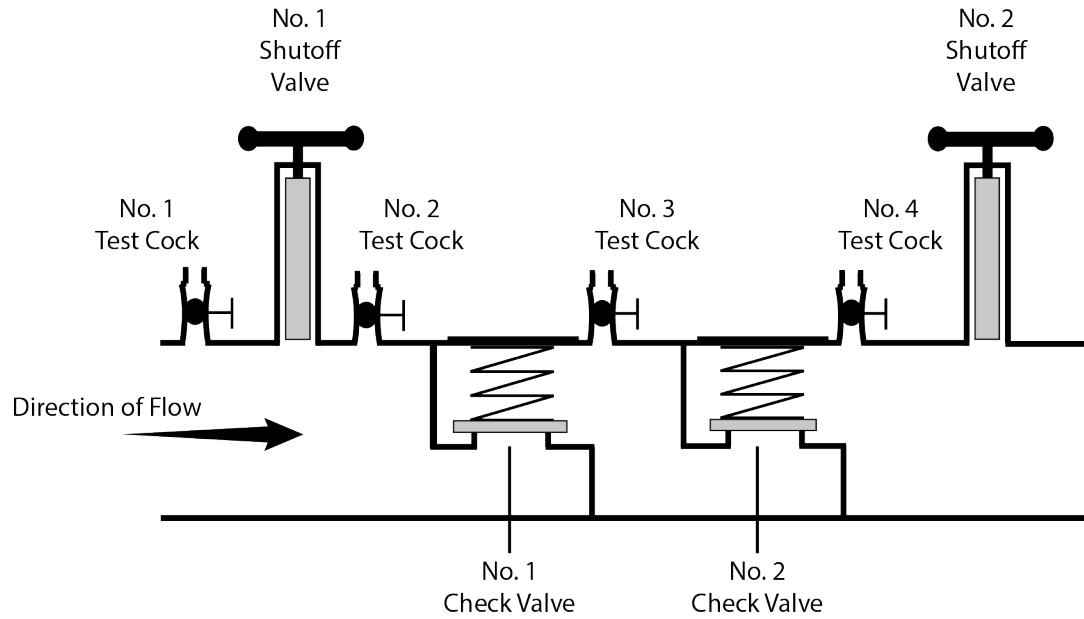
Double check detector backflow prevention assembly – type II ²



² © 2023 University of Southern California. Used with permission.

Appendix C

Diagram 3
Double check valve backflow prevention assembly³

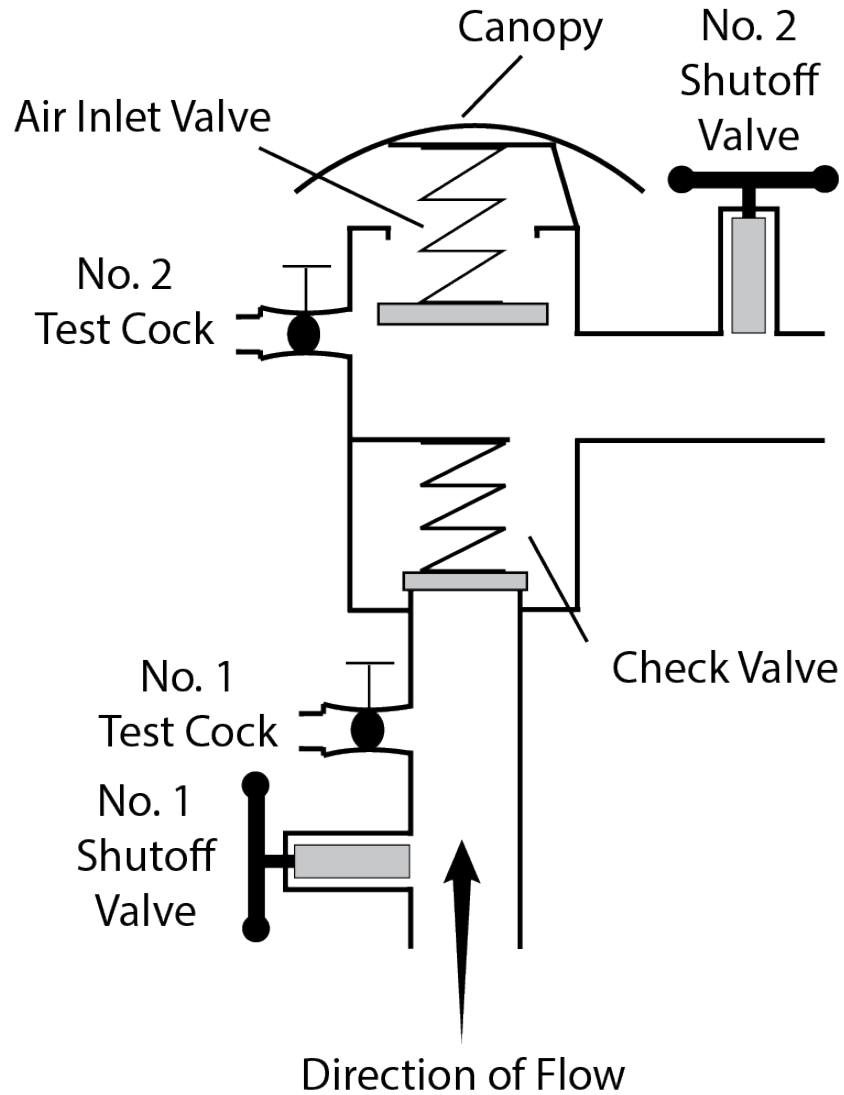


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Appendix C

Diagram 4

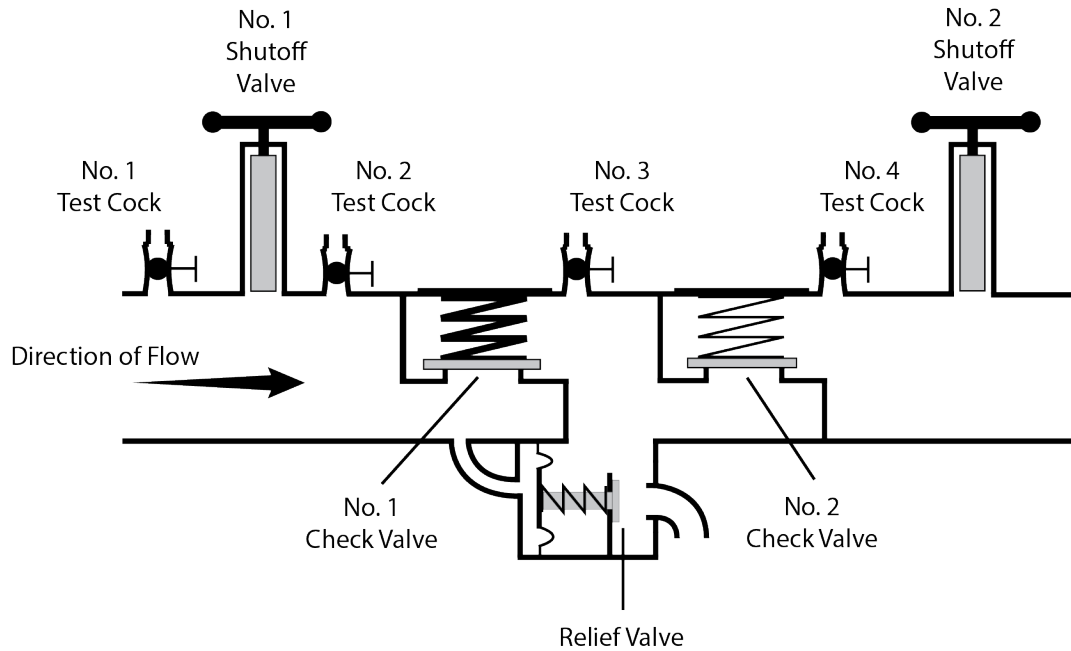
Pressure vacuum breaker backsiphonage prevention assembly⁴



⁴ © 2023 University of Southern California. Used with permission

Appendix C

Diagram 5
Reduced pressure principle backflow prevention assembly⁵

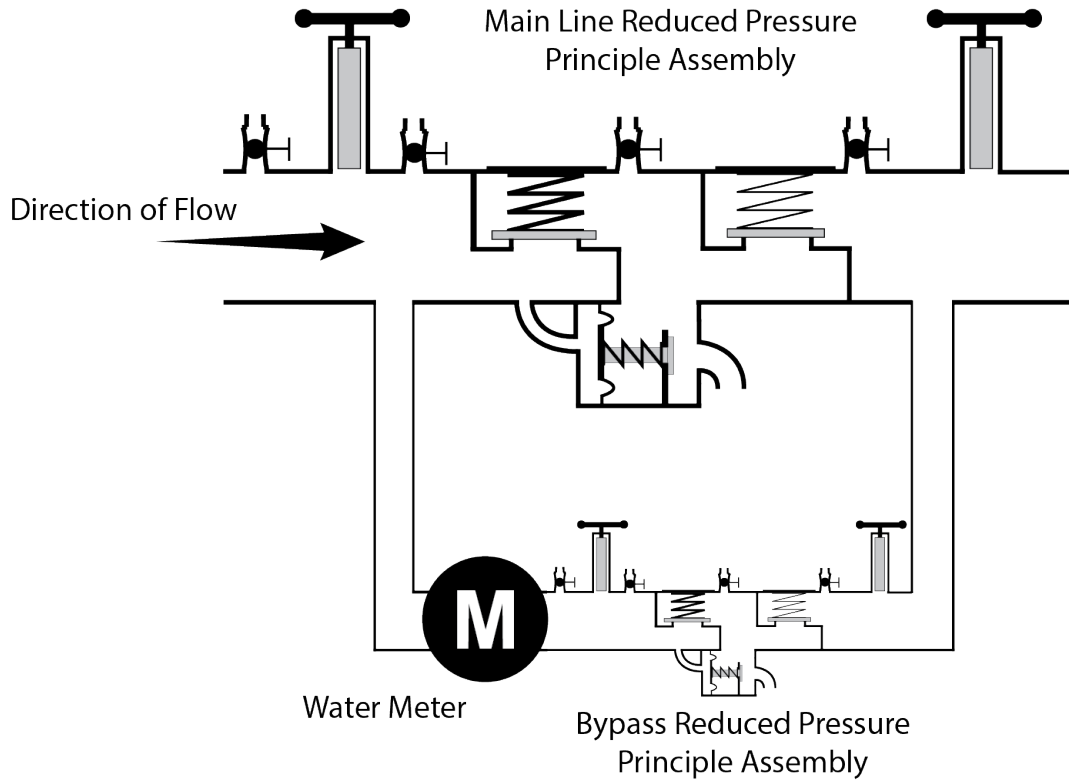


⁵ © 2023 University of Southern California. Used with permission

Appendix C

Diagram 6

Reduced pressure principle detector backflow prevention assembly⁶

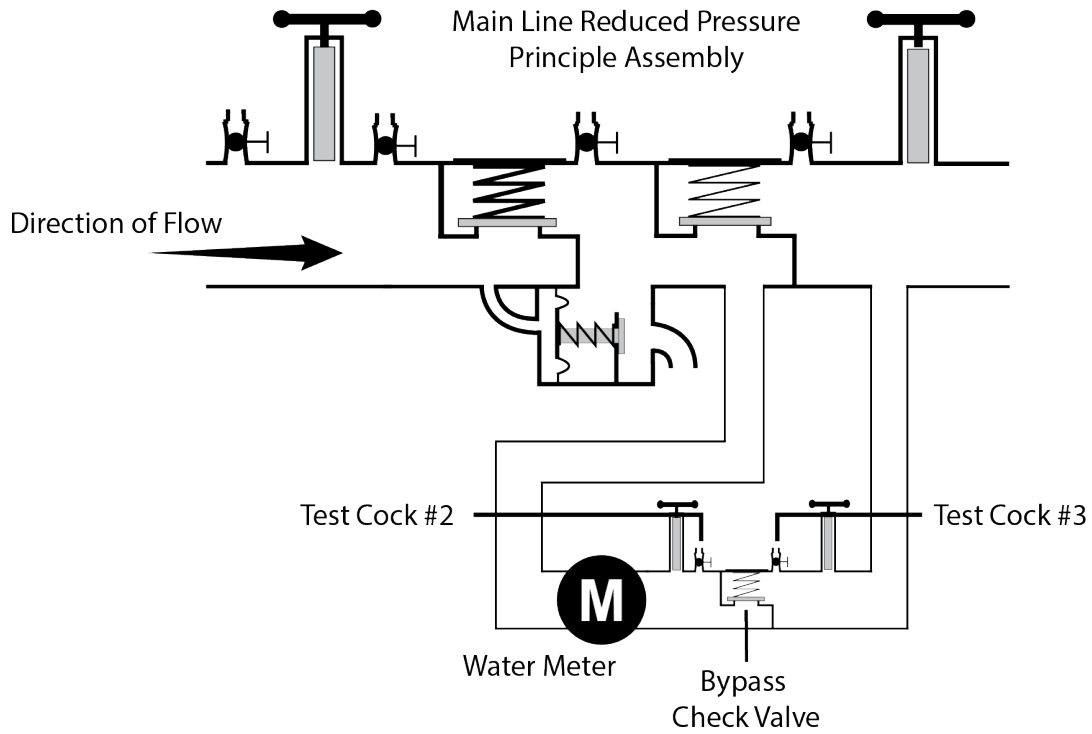


⁶ © 2023 University of Southern California. Used with permission

Appendix C

Diagram 7

Reduced pressure principle detector backflow prevention assembly – type II⁷

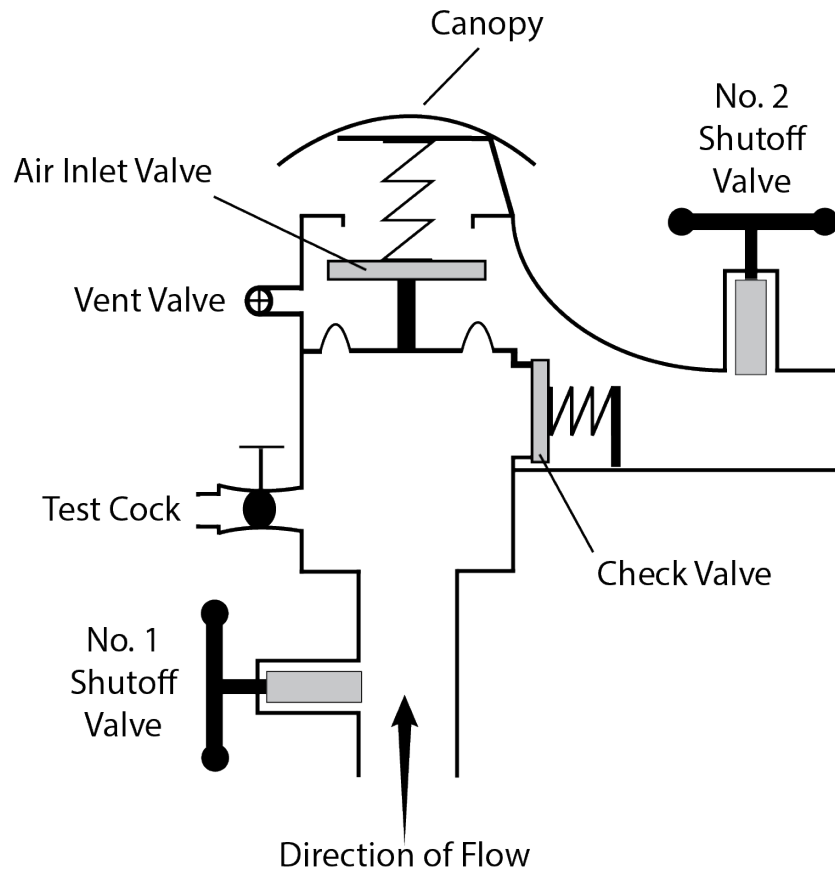


⁷ © 2023 University of Southern California. Used with permission

Appendix C

Diagram 8

Spill-resistant pressure vacuum breaker backsiphonage prevention assembly⁸



⁸ © 2023 University of Southern California. Used with permission

Appendix C

Swivel-Elb Design and Construction Criteria

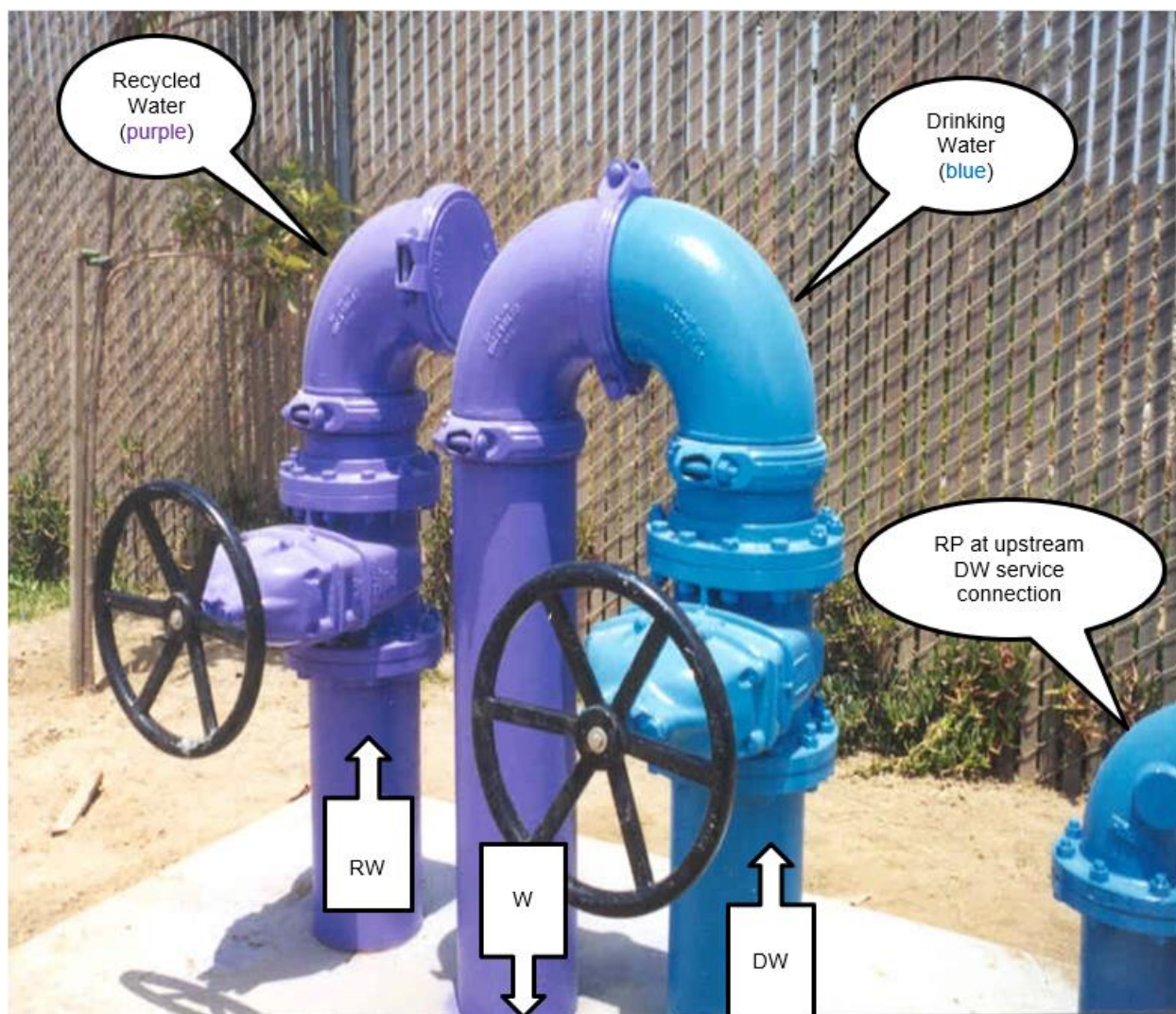
The criteria below, in conjunction with the swivel-elb diagrams that follow (Diagrams 9a and 9b), are **minimum** acceptable design and construction-related requirements for utilizing a swivel-elb. For restrictions and allowances for utilizing a swivel-elb, see CCCPH section 3.2.2.

- A. Prior to operation of a swivel-elb, the PWS will receive approval for the design and construction plans of that swivel-elb from the State Water Board.
- B. The drinking water supply must not, under any circumstances, be directly connected to the recycled water supply, nor be designed such that the recycled water use site could be supplied concurrently by a recycled water supply and a drinking water supply.
- C. The drinking water supply line and the recycled water supply line must be offset (see Diagram 9b) in a manner that ensures a tee-connection, spool, or other prefabricated mechanical appurtenance(s) could not be readily utilized in lieu of the swivel-elb connection, nor result in the recycled water use site being supplied concurrently by recycled water and drinking water.
- D. The recycled water supply line used in conjunction with the swivel-elb must be the only recycled water supply to the recycled water use area.
- E. The swivel-elb must be located as close as practical to the public water system service connection, with the swivel-elb connection being located as close as practical to the RP upstream of the swivel-elb.
- F. The swivel-elb must:
 - 1. be located above ground;
 - 2. be color-coded pursuant to section 116815 of the CHSC and its implementing regulations;
 - 3. include appropriate signage, as required by regulation and the State Water Board;
 - 4. be provided the security necessary to prevent interconnections, vandalism, unauthorized entry, etc.; and
 - 5. be provided with meters on both the recycled water service and drinking water service connections.

Legend for Diagram 9a and 9b (also see next page)

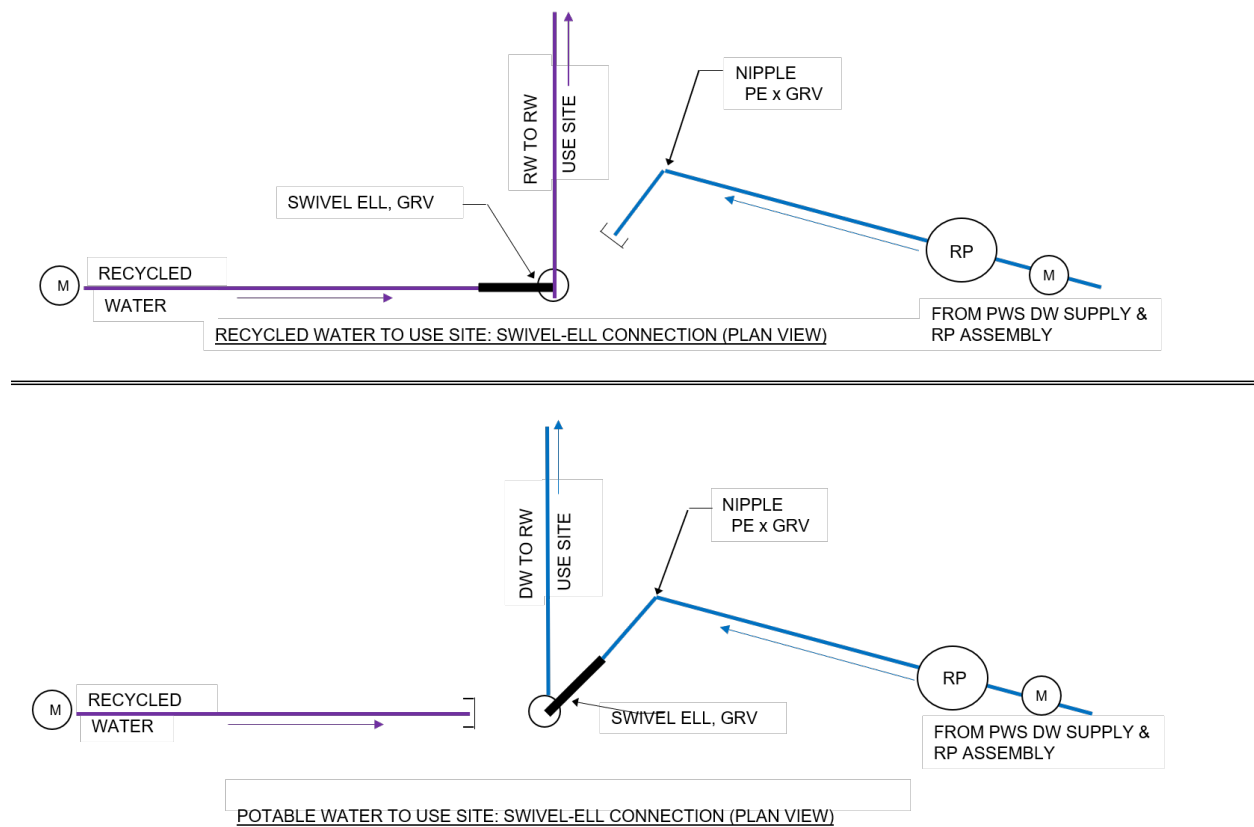
- RP = Reduced pressure principle backflow prevention assembly
- RW = Tertiary-treated recycled water originating from wastewater treatment facility
- DW = Drinking water originating from a public water system
- W = Water (tertiary recycled water or drinking water) to use site. As pictured, configured for supplemental drinking water to the use site.
- M = Meter (*next page*)
- PE = Plain End (*next page*)
- GRV = Groove (*next page*)
- PWS = Public Water System (*next page*)

Diagram 9a: Example Swivel-Ell Pictorial (also see Plan View Schematics)



Note: The RP, a required component of an acceptable swivel-ell, is not shown in the picture.

**Diagram 9b: Swivel-ELL Typical Plan View Schematics
(not intended to be an exact portrayal of the pictorial)**



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Appendix D

High Hazard Premises

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APPENDIX D

HIGH HAZARD CROSS-CONNECTION CONTROL PREMISES

The list below identifies premises that require backflow protection provided by an air gap or a reduced pressure principle backflow prevention assembly, unless noted otherwise. The list below is not intended to be all-inclusive. A PWS, State Water Board, or local health agency may require an AG, RP, or both to protect a PWS from other hazards not listed below and identified in premises through the hazard assessment completed in CCCPH Chapter 3, section 3.2.1. A PWS may reduce or increase the minimum protection required for a previously hazard-assessed user premise following a hazard reassessment as described in CCCPH Chapter 3, section 3.2.1.

1. Sewage handling facilities
2. Wastewater lift stations and pumping stations
3. Wastewater treatment processes, handling, or pumping equipment that is interconnected to a piping system connected to a PWS (+)
4. Petroleum processing or storage plants
5. Radioactive material storage, processing plants or nuclear reactors
6. Mortuaries
7. Cemeteries
8. Sites with an auxiliary water supply interconnected with PWS (+)
9. Sites with an auxiliary water supply not interconnected with PWS
10. Premises with more than one connection to the PWS (++++)
11. Recycled water (++)(+++)
12. Recycled water interconnected to piping system that contains water received from a PWS (+)
13. Graywater systems, as defined in California Water Code Section 14876, that are interconnected to a piping system that is connected to a PWS
14. Medical facilities
15. Kidney dialysis facilities
16. Dental office with water-connected equipment
17. Veterinarian facilities
18. Chemical plants
19. Laboratories
20. Biotech facilities
21. Electronics manufacture
22. Dry cleaner facilities
23. Industrial or commercial laundry facilities
24. Metal-plating facilities
25. Business park with a single meter serving multiple businesses
26. Marine-port facilities
27. Car wash facilities
28. Mobile home park, RV park, or campgrounds with RV hookups

- 29. Hotels/motels
- 30. Gas stations
- 31. Fire stations
- 32. Solid waste disposal facilities
- 33. Pet groomers
- 34. Agricultural premises
- 35. Hazard assessment access denied or restricted
- 36. Railroad maintenance facilities
- 37. Incarceration facilities (e.g. prisons)
- 38. Temporary connections to fire hydrants for miscellaneous uses, including construction
- 39. Private water distribution mains
- 40. Drinking water storage tank overflow connected to a sump or storm drain (+)
- 41. Airports

(+) Premise isolated by air gap only except as allowed through CCCPH Section 3.2.2(c)

(++) Dual-plumbed use areas established per CCR Title 22, Section 60313 through 60316.

(+++) Residences using recycled water for landscape irrigation as part of an approved dual plumbed use area established pursuant to CCR Title 22, sections 60313 through 60316 shall use, at a minimum, a DC. If the water supplier is also the supplier of the recycled water, then the recycled water supplier may obtain approval of the local public water supplier or the State Water Board, to utilize an alternative backflow protection plan that includes an annual inspection of both the recycled water and potable water systems and an annual cross-connection test of the recycled water and potable water systems pursuant to subsection 60316(a) in lieu of any BPA.

(++++) All connections must receive at least the same level of protection excluding fire protection when connected to the PWS distribution system (e.g. if one connection requires an RP then all connections must have RPs installed).

Appendix E

General Range of Knowledge for Cross-
Connection Control Specialists

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APPENDIX E

General Range of Knowledge for Cross-Connection Control Specialists

To effectively prevent unintended backflow into a PWS's distribution system, it is necessary for a cross-connection control specialist to have an understanding of a range of subjects related to cross-connection control. This appendix provides a list of such subjects.

This appendix is not meant to preclude instruction of additional subjects that may be necessary or beneficial to the goal of a prospective or existing cross-connection control specialist in being proficient in protecting public health from backflow through cross-connection control measures. Emphasis on particular subjects should be in a manner that best achieves that goal.

(a) GENERAL

- (1) Cross-connection control terminology.
- (2) The history leading to the need for cross-connection control, including causes, impacts, including but not limited to:
 - (A) potable water distribution systems;
 - (B) examples of backflow incidents and actual or potential public health impacts; and
 - (C) evolution of methods of cross-connection control and backflow prevention assemblies.
- (3) Hydraulics (general) – An understanding of hydraulic gradients, pressure variations, flow rates, temperature, the properties of water, backsiphonage, backpressure, and other elements necessary to understand the causes for backflow.
- (4) Public outreach – How to appropriately convey the value of cross-connection control to PWS personnel and the public.

(b) LAWS, REGULATIONS, AND GUIDANCE

- (1) Federal – Applicable federal laws, regulations, and guidance.
- (2) State – California laws and regulations, including, but not limited to, the State Water Resources Control Board's most recent edition of its *Cross-Connection Control Policy Handbook* and other requirements related to cross-connection control.
- (3) Local – An understanding of the need to ensure local requirements are considered and how best to find such requirements.

(c) HAZARD ASSESSMENTS AND METHODS TO PREVENT BACKFLOW

A comprehensive understanding of how to conduct cross-connection surveys of water systems for the purpose of identifying cross-connections, assessing hazards, and identifying the most effective and legally appropriate methods for protection from backflow. At a minimum, the following topics should be considered to achieve such an understanding:

(1) Surveys:

- (A) Preparation (e.g., authority, notification, prioritizing customers/premises, coordinating with public water systems, etc.);
- (B) Design and as-built drawings related to water supply and cross-connection control;
- (C) Public water system schematics;
- (D) How to identify existing and new construction, with an understanding of how construction may impact backflow protection;
- (E) How to identify cross-connections (actual and potential);
- (F) How to identify and differentiate between high hazard and low hazard cross-connections; and
- (G) Problems associated with multi-story buildings, multiple service connections at a premises, typical water-use equipment, etc., and varying types of water service, including irrigation, recycled water, gray water, fire prevention systems, and dual plumbed premises.

(2) Assessing Hazards:

- (A) Identifying and differentiating between premises activities leading to high hazard cross-connections and low hazard cross-connections (for examples of high hazard activities, see Appendix D); and
- (B) Understanding potential public health impacts from backflow associated with the problems in section (c)(1)(G) of this appendix.

(3) Assemblies and Methods for Backflow Prevention:

- (A) A comprehensive understanding of approved methods for cross-connection control and preventing backflow with respect to an assessed hazard;
- (B) Identifying unapproved methods for cross-connection control and preventing backflow;
- (C) An understanding of components, design and operation, proper installation and location of backflow prevention assemblies, including air gaps, and backflow prevention assembly field test methods, field test results, and the assessment of air gaps; and
- (D) Identifying unapproved assemblies, as well as those assemblies whose operation and/or state of repair necessitates replacement with an approved assembly.

(d) CROSS-CONNECTION CONTROL PROGRAMS

A comprehensive understanding of the development, elements, and administration of cross-connection control programs, including, but not limited to:

- (1) An ability to assess the federal, state, and local requirements applicable to a public water system's cross-connection control program, such that adherence to the cross-connection control program would result in compliance with the requirements;
- (2) The roles, responsibilities, and authority of individuals and entities involved in the critical elements of a successful plan for cross-connection control (see CCCPH section 3.1.4); and
- (3) The ability to assess the components of a public water system's Cross-Connection Control Plan (see CCCPH section 3.1.4) that best assures the prevention of undesired backflow into the public water system's distribution system, and to communicate deficiencies to public water system personnel.

(e) CROSS-CONNECTION TESTS

A comprehensive understanding of:

- (1) The purpose of a cross-connection test and when a cross-connection test should be performed;
- (2) The ability to develop protocols and make arrangements for cross-connection tests, and subsequently oversee and/or perform such cross-connection tests, in a manner that determines whether interconnections exist between unapproved sources and approved water supplies; and
- (3) Follow-up actions and notifications if a cross-connection test indicates an interconnection.

(f) RECORDKEEPING AND INCIDENT RESPONSE

A comprehensive understanding of:

- (1) The agencies and authorities to be notified in the event of a backflow incident;
- (2) How to determine the cause of a backflow incident and the actions necessary to prevent similar incidents in the future;
- (3) How to properly document a backflow incident, including but not limited to the information in the example backflow incident response form in Appendix F; and
- (4) How to properly document the elements associated with surveys and hazard assessments, including those identified in section (c) of this appendix.

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Appendix F

Example Backflow Incident Reporting Form

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BACKFLOW INCIDENT REPORT FORM

Water System: _____

Water System Number: _____

Incident Date: _____

Incident Time (if known): _____

Incident Location: _____

How was the incident discovered?

Backflow Originated from:

Premise Location: _____

Address: _____

Premise Contact Person: _____ Title: _____

Phone: _____ Email: _____

Connection Type: (please check one)

☐ Industrial ☐ Commercial ☐ Single-Family Residential ☐ Multi-Family Residential

☐ Irrigation ☐ Recycled Water ☐ Water System Facility

☐ Other: _____

Description and source of backflow substance (please be as descriptive as possible):

If available, please attach an MSDS or other chemical description form

Was the backflow fluid contained within the user side? YES ☐ NO ☐

Estimated Number of Affected Persons: _____

Number and description of consumer complaints received:

Did any consumers report illness? Please describe.

If applicable, please describe the consumer notification:

INVESTIGATION

Please describe the water system investigation including time frames:

What was the area system pressure? _____

Is this within typical range: YES ☐ NO ☐ - typical pressure: _____

Was a sample of the water contaminated by the backflow incident collected and stored before flushing? YES ☐ NO ☐

Please describe all sampling:

DDW recommends laboratory or field sampling for the following parameters: total coliform, E. coli, free and total chlorine residual, pH, odor, turbidity, temperature, and color. Additional sampling should be collected at the PWS and regulatory agency's discretion.

CORRECTIVE ACTIONS

Please describe the corrective actions taken by the water system:

Was the chlorine residual increased after discovery of backflow incident? YES ☐ NO

Date of the last cross-connection control hazard assessment of the premise with the backflow incident conducted: _____

Did the premise have backflow prevention assemblies? YES ☐ NO ☐

Date of most recent backflow prevention assembly test(s): _____

When was the Division of Drinking Water or Local County Health office notified?

Date: _____ Time: _____ Contact Person: _____

Was the Division or Local County Health notified within 24 hours? YES ☐ NO

Other agencies or organizations contacted?

CERTIFICATION

Name: _____ Job Title: _____

Certification(s): _____

Please list all cross-connection control related certifications including number and expiration date

I certify that the forgoing information is true and correct to the best of my ability.

Signature: _____ Date: _____

Attach the following applicable documentation

1. Laboratory Test Results
2. Sketch of the cross-connection and modifications
3. MSDS or chemical information forms if chemical hazard is known
4. Applicable backflow assembly test reports including the most recent test before the incident
5. Other relevant supporting documentation

Appendix G

Related Statutes and Regulations

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The following laws and regulations are considered related or tangential to the CCCPH, and are included in a descriptive format to provide additional, relevant background information

California Laws and Regulations

In addition to the California SDWA statutory requirements cited in CCCPH Chapter 1, section 1.3.1, California has statutes addressing certain authorities and requirements that may have influenced the CCCPH or may otherwise be of interest.

- Urban and community water systems must have a written policy on discontinuation of residential service for nonpayment and must not discontinue residential service for nonpayment if certain conditions are met. (CHSC sections 116900 – 116926)
- Senate Bill 1263 (2017) requires that before a person submits an application for a permit for a proposed new public water system, the person shall first submit a preliminary technical report which must include a cost comparison of a new public water system and consolidations with an existing system. (CHSC section 116527)
- Effective June 24, 2015, Senate Bill 88 (SB 88) (Statutes 2015, Chapter 27) added sections 116680-116684 to the CHSC, allowing the State Water Board to require certain water systems that consistently fail to provide safe drinking water to consolidate with, or receive an extension of service from, another public water system. The consolidation can be physical or managerial.
- Local health officers may maintain programs for the control of cross-connections by water users, within water users' premises, where public exposure to backflow may occur. Such programs may include water user premises inspections, collection of fees, certification of backflow prevention assembly¹ (BPA) testers, and other discretionary elements. Local health officer BPA tester certification standards must be consistent with the standards prescribed in the CCCPH. Water users are required to comply with all orders, instructions, regulations, and notices from the local health officer regarding installation, testing, and maintenance of a BPA. (CHSC sections 116800 - 116820).
- Pursuant to the California Building Standards Law (CHSC sections 18901 - 18949.31), the California Building Standards Commission (CBSC) must administer the processes related to the adoption, approval, and publication of regulations referred to as the California Building Standards Code (Title 24, California Code of Regulation). Title 24 serves as the basis for the minimum design and construction

¹ California statutes use a variety of terms when referencing a 'backflow prevention assembly' (e.g., backflow protective device, backflow protection equipment, backflow prevention device, backflow or back siphonage protection device, backflow preventer, or backflow device). For consistency with industry terminology, 'backflow prevention assembly' is used in the CCCPH, unless directly quoted otherwise.

of buildings in California and includes the California Plumbing Code (Part 5 of Title 24), which contains requirements pertaining to cross-connection control and backflow prevention.

- A BPA intended to convey or dispense water for human consumption via drinking or cooking must meet California’s “lead free” requirements. (CHSC section 116875)
- Limits are established for the installation of backflow protection equipment where automatic fire sprinkler systems are utilized. (CHSC section 13114.7)²
- Cross-connection control must be addressed in engineering reports that are required (CCR Title 22, section 60323) for recycled water projects. (Wat. Code section 13552.8)
- If a public agency requires the use of recycled water for toilet and urinal flushing in a structure (except certain mental health facilities), the public health agency must prepare an engineering report that addresses cross-connection control. (Wat. Code section 13554)
- Prior to indoor use of recycled water in a condominium project, the entity delivering the recycled water must submit a report, for State Water Board³ approval, and include the following related to cross-connection control (Wat. Code section 13553(d)(1)):
 - The condominium project must be provided with a backflow prevention assembly approved by the State Water Board.
 - The backflow prevention assembly must be inspected and tested annually by a certified tester.
 - The condominium project must be tested by the recycled water agency or local agency at least once every four years for indications of possible cross-connections between the condominium’s potable and non-potable systems.
- California’s Department of Water Resources was required to convene a task force, known as the 2002 Recycled Water Task Force, to identify constraints, impediments, and opportunities for the increased use of recycled water and report

² CHSC section 13114.7 historically provided potential limits for backflow prevention assemblies on fire sprinklers. Even though current standards differ from the language stated in CHSC section 13114.7, it is still being provided as a historical reference as there may still be installations with the now outdated limits established in section 13114.7

³ The California Department of Public Health’s authority and responsibility pertaining to this reference was transferred to the State Water Board via Senate Bill 861 (2014, Chapter 35). As such, applicable statutory mandates that may refer to “California Department of Public Health” or “Department” may be referred to as “State Water Board” in this document.

to the Legislature by July 1, 2003. The task force was also asked to advise and make recommendations concerning cross-connection control, including the applicability of visual inspections instead of pressure tests for cross-connections between potable and non-potable water systems. (Wat. Code section 13578(b)(1). The final report⁴ provided the following recommendations to the State Water Board – Division of Drinking Water (Division):

- Prepare guidance on dual plumbed regulations (22 CCR sections 60313-60316) consistent with Appendix J of plumbing code (Chapter 15 of 2019 California Plumbing Code, formerly Chapter 16A).
- Support thorough assessment of risk associated with cross-connections between disinfection tertiary recycled water and potable water.
- Ensure uniform interpretation of cross-connection control requirement of Title 22 regulations (recycled water) and Title 17 (cross-connection control regulations)
- Recommend stakeholders to review draft Title 17 regulations.
- A person engaged in the salvage, purchase, or sale of scrap metal who knowingly possesses a backflow prevention assembly (or connections to the assembly or any part of the assembly), or who failed to report the possession of such items, which was previously owned by a utility or public agency, is guilty of a crime. (Pen. Code section 496e)
- Junk dealers or recyclers who possess a backflow prevention assembly (or connections to that assembly or any part of the assembly) without a written certification from the agency or utility owning or previously owning the assembly will be liable to the agency or utility for the wrongful possession. (Civ. Code section 3336.5 and, similarly, Bus. & Prof. Code section 21609.1)

Please note that a number of the codes, regulations, and statutes cited above are implemented under the authority of regulatory entities other than the State Water Board and would therefore be beyond the scope of this CCCPH. The intent of providing such citations is to increase general awareness with respect to other potential statutory requirements associated with cross-connection control. The list is not exhaustive and does not include other requirements that may exist, including those via regulations that may have been adopted by an appropriate regulatory entity.

Federal Laws and Regulations

⁴ California Department of Water Resources. (2003). *Water Recycling 2030: Recommendations of California's Recycled Water Task Force*

All suppliers of domestic water to the public are subject to regulations adopted by the U.S. Environmental Protection Agency (EPA) under the U.S. Safe Drinking Water Act (SDWA) of 1974, as amended (42 U.S.C. section 300f et seq.), as well as by the State Board under the California SDWA (Health & Saf. Code, div. 104, pt. 12, ch. 4, section 116270 et seq.). Additionally, the State Water Board has been delegated primacy - the responsibility and authority to administer U.S. EPA's drinking water regulations within California – on the condition that California adopt enforceable requirements no less stringent than U.S. EPA's.

The U.S. EPA currently has no distinct cross-connection control requirements that apply broadly to public water systems (PWS); however, the importance of cross-connection control is evident by the issue papers and guidance documents developed by U.S. EPA and their recognition that cross-connections and backflow represent a significant public health risk (see discussion in Chapter 2). Although U.S. EPA currently has no distinct cross-connection control requirements, the subject of cross-connection or backflow prevention assemblies is included in the U.S. SDWA and the Code of Federal Regulations (C.F.R.) in relation to PWS, including the following:⁵

- If used exclusively for non-potable services, a backflow prevention assembly (BPA) is exempt from the federal lead prohibitions. (42, U.S.C. section 300g)
- Allows increasing disinfectant concentrations in a PWS distribution system in the event of a cross-connection (backflow) event. (40 C.F.R. section 141.130(d))
- Proper maintenance of the distribution system, including cross-connection control, is identified as a best available technology (BAT) for microbial contaminant control. (40 C.F.R. section 141.63(e))
- Under the federal Revised Total Coliform Rule, a PWS having a cross-connection control program is one of the enhancements necessary to reduce monitoring for a PWS that had been under an increased monitoring frequency. (40 C.F.R. section 141.854(h)(2))
- Under the federal Revised Total Coliform Rule, a PWS having a cross-connection control program is a criterion for a state to allow a reduced monitoring frequency (40 C.F.R. section 141.855(d)(1))
- If a state allows the monitoring frequency reductions previously mentioned under the federal Revised Total Coliform Rule, a state is required to include in its primacy package to U.S. EPA how a PWS will be required to demonstrate cross-connection control. (40 C.F.R. section 142.16(q))

⁵ For requirements unrelated to cross-connection control, please consult California's laws and regulations specific to the topic of interest. California may have more stringent requirements (e.g., reduced monitoring allowed via federal regulations may be prohibited in California).

APPENDIX D

SFPUC/SFDPH-EH Interdepartmental Work Order and Workplan

WORK ORDER BUDGET AGREEMENT

Fiscal Year 2025 - 2026

Work Order Amount: \$497,568

Requesting Department	
Dept Code & Title:	PUC Water Quality
Authority Code & Title:	
Fund Code & Title:	1G/AGF/AAA
Project Code & Title:	470101 SFDPH-SFPUC Water Collaboration Project
Activity Code & Title:	
Account Code & Title:	

Performing Department	
Dept Code & Title:	251975 HPH EnvirHlth
Authority Code & Title:	10002 Interdepartmental-Overhead
Fund Code & Title:	10060 GF Work Order
Project Code & Title:	10001980 HD EH WO-UW Water Quality
Activity Code & Title:	0001 WO-UW Water Quality
Account Code & Title:	486760 Exp Rec Fr Water Dept (AAO)

Work Statement: (Performing Department to complete)

0.4 FTE 0922 Manager I, 0.75 FTE 2802 Epidemiologist I, 1.0 FTE 6122 Sr. Environmental Health Inspector, and 0.25 FTE 1820 Jr. Administrative Analyst to provide mandated services, assist SFPUC to comply with regulations, sustain and advance emergency preparedness and response programs, and support implementation and development of policy initiatives related to drinking water resources protection, conservation and efficiency. Services include: Cryptosporidiosis and other waterborne disease monitoring activities mandated by the State Water Resources Control Board (SWRCB), cross connection control enforcement and collaboration as agreed and as mandated by SWRCB and local ordinance, emergency response planning/support, regulatory and public health activities such as technical support to the PUC on current and emerging water-related health issues, investigation of health related issues, coordination of Cryptosporidium response with the Contamination Warning System Consequence Management Plan, support for lead in water testing, participation in public meetings, and implementation of a program for the onsite treatment and use of alternate water sources as mandated by local ordinance. SFDPH will conduct monthly to bimonthly coordination meetings with the Water Quality Division Director, Senior Engineer, Chief Water Services Inspector, Laboratory Services Manager, Senior Microbiologist and other personnel. SFDPH will produce monthly activity reports documenting support activities by the 10th of the following month.

Budget: (Performing Department to complete)

2025-2026			
Job Class	Job Title	FTE	
0922_C	Manager I	0.40	\$70,527
2802_C	Epidemiologist I	0.75	\$90,209
6122_C	Senior Environmental Health Inspector	1.00	\$172,133
1820	Junior Administrative Analyst	0.25	\$24,781
Mandatory Fringes			\$117,918
Total Salaries and benefits			\$475,568
Materials and supplies			\$7,000
Telephone			\$1,000
Repro			\$4,000
Travel expenses, training and conference fees			\$10,000
Grand Total			\$497,568

Source of Funds: (Requesting Department to complete)

SFDPH-SFPUC Water Collaboration Project: 470101

Signatures:

Andrew DeGraca

Requesting Department

Date: _____

Patrick Fosdahl

Performing Department

Date: 11/29/2023 | 7:00:33 PST

DocuSigned by:

Patrick Fosdahl

6B320F48A06F41B...

SFDPH Water Program FY25 & FY26 Work Plan

PROGRAM MANAGEMENT (Doug Obana, SFDPH Environmental Health)

- **Work Order** – Submit draft FY27 and FY28 two-year work orders by 9/15/25.
- **Fiscal Year (FY) Work Plan** – Distribute Draft FY26 Work Plan by 4/1, add to the following coordination meeting agenda, and distribute Final FY Work Plan by 6/30.
- **Bimonthly/Annual Reports** – Distribute written bimonthly work order activity report at least two business days before the Coordination Meeting, and the written Fiscal Year activity report by 9/1.
- **Bimonthly Coordination Meeting** - Submit upcoming calendar year Outlook invites to all needed participants by 12/1, distribute agendas at least two business days before the meeting, and distribute draft meeting minutes within 5 business days after the meeting.
- **SFDPH Support Coordination** – Coordinate with other SFDPH units that support water-health initiatives (Communicable Disease Control, Childhood Lead Poisoning Prevention, WIC, Cavity Free SF, hospitals/clinics...).

WATER QUALITY PLANNING & REPORTING (Doug Obana, SFDPH Environmental Health)

- **SFPUC WQ Strategic Plan Updates** – Provide support for current plan implementation activities.
- **SFPUC Triennial CEC Report Update** - Provide input and review for the triennial report update due June 2025.
- **SFPUC Triennial PHG Report Update** - Provide input and review for the triennial report update due June 2025.

WATERBORNE DISEASE SURVEILLANCE & RESPONSE (Wendy Lu, SFDPH Epidemiologist)

- **Regional Water System Waterborne Disease Surveillance**
 - Send Monthly Compliance Report Letter to the WQD Director by the 5th of the following month.
 - Distribute Cryptosporidiosis Quarterly and Annual Reports within a month of each period's end.
 - Track other potential waterborne disease agents and notify WQD if anything unusual.
- **Investigate SFPUC consumer illness complaints.**
- **Provide updates on wastewater surveillance.**
- **Provide public health/epidemiological review of emerging research and issues, and respond to inquiries.**
- **Help develop Building Management/Legionella Control outreach program outline by January 2026.**

CROSS CONNECTION CONTROL (Arthur Duque, SFDPH Sr. Inspector, Doug Obana, SFDPH Environmental Health)

- **Attend monthly CCSF Cross Connection Control Program Meeting.**
- **Submit a Monthly Activities Report by the 8th of the following month that includes:**
 - NOVs issued,
 - customer appeal hearings and verdicts,
 - referrals to DBI for missing plumbing permits,
 - buildings posted for enforcement,
 - site visits excluding for posting,
 - assemblies tested or repaired in response to enforcement action,
 - suspended tester certifications and thus PTOs,
 - conferences/administrative hearings with testers for enforcement, and
 - other actions of note.

- **Participate in annual tester meeting and support development of webinar.**
- **Manage the CCSF Authorized Backflow Prevention Assembly Tester program:** administer exams, maintain records, track attendance at annual tester meeting/webinar, support tester community, check tester certifying organization websites for suspended certifications.
- **Take enforcement action against customers with overdue assemblies** (issue Notice-of-Violations, conduct Director's Hearings, oversee abatements...).
- **Develop a program for Authorized Cross-Connection Control Specialists by December 2026.**

STAKEHOLDER ENGAGEMENT (Doug Obana, SFDPH Environmental Health)

- **SFPUC Water Quality Communication Workgroup**
 - Attend monthly meetings.
 - Review and comment on draft materials (fact sheets, web pages...).
- **Participate in public meetings and/or prepare written responses related to water/health issues.**

FLUORIDATION (Maryna Spiegel, SFDPH Children's Oral Health Program Manager)

- **SFDPH Fluoridation Policy** - Work with SFDPH Dental Health Program (CavityFreeSF) on Health Director policy review.
- **Track other activities** (i.e., *SFPUC Annual Training Report to SFDPH Dental Health*).

LEAD (Doug Obana, SFDPH Environmental Health)

- **WIC Program Free Lead Test Vouchers** - Market program and provide vouchers.
- **Liaison with SFDPH Childhood Lead Prevention Program.**

EMERGENCY RESPONSE (Doug Obana, SFDPH Environmental Health)

- **Provide 24/7 response to significant water quality/public health events.**
- **Participate in emergency preparedness and security plans/exercises.**

MISCELLANEOUS (Doug Obana, SFDPH Environmental Health)

- Provide as needed Hazardous Materials Program support.
- Liaison with Well Closure Program and provide updates, as needed.

FIVE-YEAR PLAN (Doug Obana, SFDPH Environmental Health)

- **Help finalize the Building Management/Legionella Control outreach program by January 2027.**
- **Initiate the Building Management/Legionella Control Program outreach by June 2027.**
- **Support the SFPUC Alternative Water Supply Program (e.g., DPR/IPR project plans and outreach).**

APPENDIX E

Description of Backflow Prevention Assemblies and Air Gaps

WQD has approved six basic types of BPAs for containment in permanent installations: RP, DC, RPDA, DCDA, RPDA Type II (RPDA-II), and DCDA Type II (DCDA-II). These assemblies are described in sections E.1-E.6. Pressure vacuum breakers and spill-resistant pressure vacuum breakers are described in sections E.7 and E.8, respectively. Section E.9 describes requirements for Air Gaps.

E.1 Reduced Pressure Principle Backflow Prevention Assembly

An RP consists of two check valves and an automatically operating, differential relief valve located between the two check valves. The assembly is furnished with test cocks and a resilient seated shutoff valve on each end to enable testing for water tightness. Figure E-1 shows some common RP configurations.

RPs are designed so that the zone between the check valves is always kept at a pressure at least two pounds less than the supply pressure. This design protects against both backpressure and backsiphonage conditions. RPs provide a high level of protection as long as all components are operating as intended. When a backflow condition occurs, the relief valve discharges to the atmosphere and the valves do not allow flow in the reverse direction.

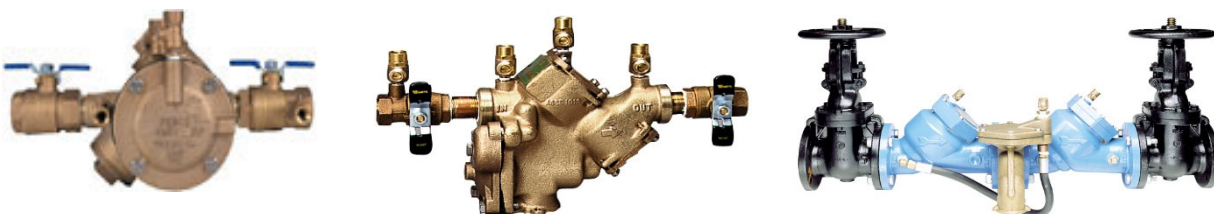


Figure E-1. Typical Reduced Pressure Principle Assemblies

RPs must always be installed above grade. This assembly may never be installed in a meter box, pit, or vault. If installed within a customer's building, there must be an adequate floor drain (not a dry well) beneath the assembly. RPs must not be installed in vertical runs of pipe unless they have been approved for this type of use.

E.2 Double-Check Valve Assembly

A DC consists of two independently acting, internally loaded check valves with resilient seated shutoff valves at each end of the assembly. The assembly is equipped with test cocks for testing the water tightness of each check valve. Each check valve is spring-loaded in a closed position and requires at least a pound of pressure to open. DCs protect against both backsiphonage and backpressure conditions, but they provide a lower level of protection than RPs, because if the valves malfunction, there is no pressure relief valve discharging to the atmosphere, and therefore a backflow condition could go undetected. Figure E-2 shows common DC configurations.



Figure E-2. Typical Double-Check Valve Assemblies

E.3 Reduced Pressure Principle Detector Assembly

An RPDA is designed for situations requiring the protection of an RP as well as the detection of unauthorized water use or leaks. The RPDA's bypass meter must register accurately at low flows. An RPDA is normally used on fire lines that might contain contaminants, such as anti-freeze additives or Foamite. Figure E-3 shows an example of an RPDA.

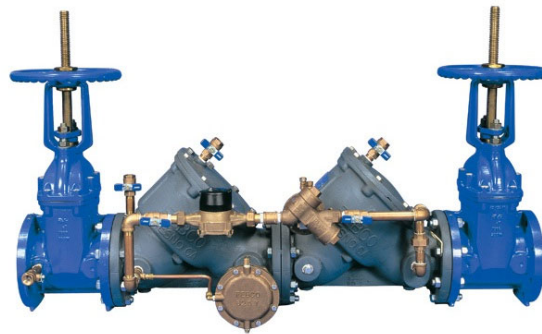


Figure E-3. Typical Reduced Pressure Principle Detector Assembly

E.4 Double-Check Detector Assembly

A DCDA consists of two spring-loaded check valves, a bypass assembly with a water meter and meter-sized double-check valve assembly, and two tightly closing gate valves. The meter registers accurately at very low flow rates. Figure E-4 shows some common DCDA configurations.



Figure E-4. Typical Double-Check Detector Assemblies

DCDAs are used primarily in fire service installations to protect the potable water supply line from:

- Possible contamination or pollution from the fire service system.
- Backpressure from fire service booster pumps.
- Stagnant water that resides in fire lines over extended periods of time.
- The addition of non-potable water through outside fire district connections.

The metered assembly allows the detection of water loss in the fire service line, such as from fire line leakage or deliberate water theft.

E.5 Reduced Pressure Principle Detector Assembly, Type II

An RPDA-II consists of a line-size approved RP with a specific bypass around the second check; the bypass has a specific water meter and an approved check valve. The assembly is most often installed on fire sprinkler systems and can be used to protect against health (contaminant) and non-health (pollutant) hazards. Figure E-5 illustrates a typical RPDA-II.

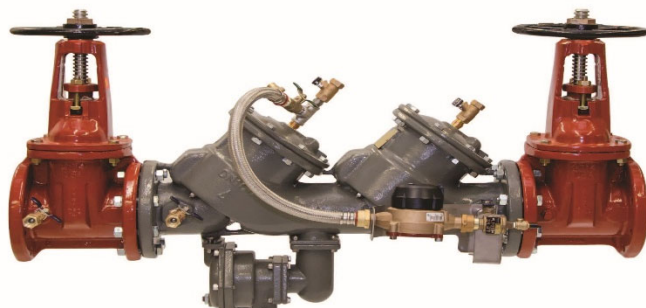


Figure E-5. Typical Reduced Pressure Principle Detector Assembly, Type II

E.6 Double-Check Detector Assembly, Type II

A DCDA Type II (DCDA-II) consists of a line-sized approved DC with a bypass around the second check; the bypass has a specific water meter and a check valve. The assembly is most often installed on fire sprinkler systems and should only be used to protect against non-health hazards (pollutants). Figure E-6 illustrates a typical DCDA-II.

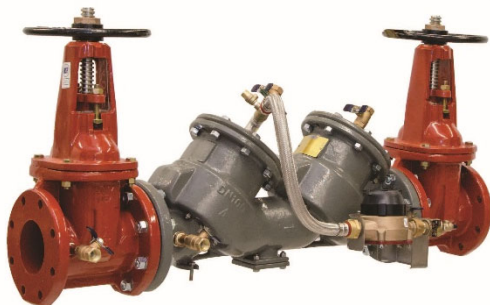


Figure E-6. Typical Double-Check Detector Assembly, Type II

E.7 Pressure Vacuum Breaker

A PVB consists of an independently operating, internally loaded check valve and an independently operating, air inlet valve located on the discharge side of the check valve. The assembly is equipped with test cocks and tightly closing shutoff valves at each end. PVBs are designed to protect only against backsiphonage conditions, not against backpressure; the level of protection, therefore, is lower than that afforded by RPs or DCs. PVBs must be installed in an upright orientation, and the highest outlet of the system, e.g., a sprinkler head or hose bibb, must be at least 12 inches below the elevation of the outlet of the PVB. Figure E-7 shows a typical PVB.

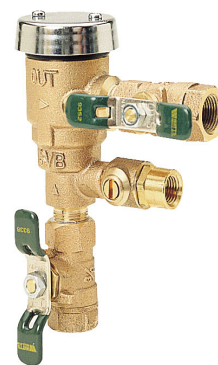


Figure E-7. Typical Pressure Vacuum Breaker

E.8 Spill-Resistant Pressure Vacuum Breaker

An SVB consists of an independently operating, internally loaded check valve and independently operating, loaded air inlet valve on the discharge side of the check valve. The SVB must be equipped with a properly located resilient seated test cock, bleed/vent port, and tightly closing resilient seated shutoff valves at each end of the assembly. An SVB can be used for protection against both pollutants and contaminants under backsiphonage conditions (only). Figure E-8 shows a typical SVB.



Figure E-8. Typical Spill-Resistant Pressure Vacuum Breaker

E.9 Air Gap

An Air Gap is a physical break between a supply pipe and a receiving vessel. Air gaps can be fabricated from commercially available plumbing components or purchased as separate units and integrated into plumbing and piping systems. Requirements for Air Gaps are set forth in the 2013 California Plumbing Code, Chapter 6, Table 603.3.1 and include the following:

- The outlet of a pipe and the top of the reservoir (overflow rim) or drain must have a vertical separation of at least twice the inner diameter (ID) of the pipe upstream of the Air Gap or 1 inch, whichever is greater.
- If the Air Gap is near a wall, where “near” is defined as less than three times the ID of the pipe, the vertical separation must be at least three times the ID of the pipe or 1½ inches, whichever is greater.
- If the Air Gap is near a corner, where “near” is defined as less than four times the ID of the pipe away from intersecting walls, the vertical separation must be at least four times the ID of the pipe, or 2 inches.

Typical Air Gaps are illustrated in Figure E-9.

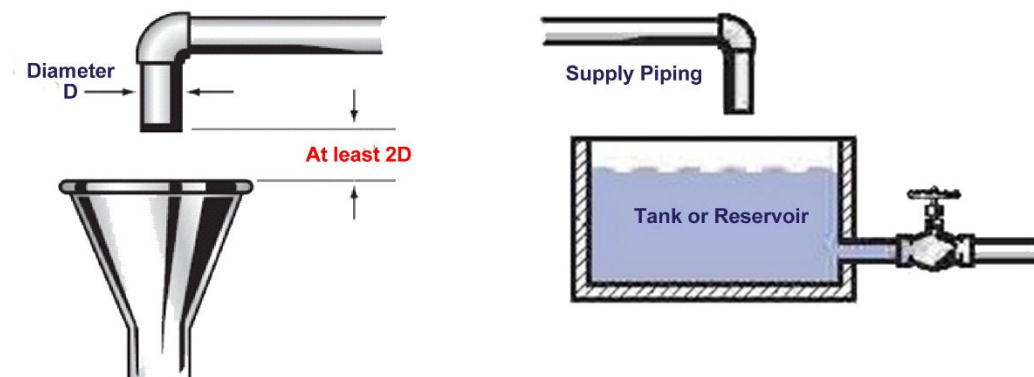


Figure E-9. Typical Air Gaps

Air gaps need to be inspected as frequently as do mechanical backflow preventers, and their adequacy must be verified, because Air Gaps can be purposefully or inadvertently compromised. For example, when excessive splash occurs, users might raise the receiving vessel or lower the supply piping, thus defeating the purpose of the Air Gap.

When properly implemented, an Air Gap represents the highest level of protection available against backflow, as it is physically impossible for water to flow back through a gap that is open to the atmosphere.

APPENDIX F

Cross-Connection Control Program Forms

Backflow Prevention Application Form (for new installations)
 Residential Hazard Assessment Survey Form
 Commercial Hazard Assessment Survey Form
 Hazard Assessment Form
 Backflow Incident Report Form
 Request to Purchase Backflow Tags
 Request to Exchange Backflow Tags
 Monthly Summary for SWRCB
Rules of Service and Operation for Swivel-Elbs
 WQD Inspection of Swivel-Elb

Backflow Prevention Application Form (Online application)



CITY AND COUNTY OF SAN FRANCISCO
PUBLIC UTILITIES COMMISSION
WATER QUALITY DIVISION



User: ie:

BACKFLOW PREVENTION APPLICATION FORM

* Required fields

DATE June 16, 2025

REASON FOR APPLICATION:

CUSTOMER INFORMATION

First Name: * Last Name: *
☐ Select if Signator

Service Address
Line 1: * Service Address
Line 2:
Enter Street Number first, then Tab and start entering Street Name for dropdown. Ex. 'pr'. Then select full street name. Ex. 'Prosper St.'

Service City, State: San Francisco, CA Service Zip: *
Mailing Address is optional, enter only if different than Street Address. Address1, City, State and Zip required.

Mailing Address
Line 1: Mailing Address
Line 2:
Mailing City: Mailing State:
Mailing Zip:
Phone: * () - Ext. Ext. optional
Cross Street: *
Email: *

COMMERCIAL * ☐ Yes ☐ No RESIDENTIAL * ☐ Yes ☐ No WATERFRONT * ☐ Yes ☐ No
NEW CONSTRUCTION * ☐ Yes ☐ No REMODEL * ☐ Yes ☐ No REPLUMB * ☐ Yes ☐ No

PLEASE CHECK BOX FOR KNOWN (Yes), NOT APPLICABLE (No) OR UNKNOWN (Unknown) HAZARDS

Unusual Plumbing				Industrial Activities			
Dual Plumbing	☐ Yes	☒ No	☐ Unknown	Dual Plumbing	☐ Yes	☒ No	☐ Unknown
Above-grade water storage tank	☐ Yes	☒ No	☐ Unknown	Above-grade water storage tank	☐ Yes	☒ No	☐ Unknown
Below-grade water storage tank	☐ Yes	☒ No	☐ Unknown	Below-grade water storage tank	☐ Yes	☒ No	☐ Unknown
Intricate plumbing/piping	☐ Yes	☒ No	☐ Unknown	Intricate plumbing/piping	☐ Yes	☒ No	☐ Unknown
Multiple standard service connections	☐ Yes	☒ No	☐ Unknown	Multiple standard service connections	☐ Yes	☒ No	☐ Unknown
Other	☐ Yes	☒ No	☐ Unknown	Other	☐ Yes	☒ No	☐ Unknown
Auxiliary Water Supply				Residential/Commercial			
Recycled water	☐ Yes	☒ No	☐ Unknown	Boiler	☐ Yes	☒ No	☐ Unknown
Rainwater	☐ Yes	☒ No	☐ Unknown	Heating other than forced air	☐ Yes	☒ No	☐ Unknown
Graywater	☐ Yes	☒ No	☐ Unknown	Hydronic heating/radiant heat	☐ Yes	☒ No	☐ Unknown
Black water	☐ Yes	☒ No	☐ Unknown	Dedicated irrigation system	☐ Yes	☒ No	☐ Unknown
Groundwater	☐ Yes	☒ No	☐ Unknown	Swimming pool	☐ Yes	☒ No	☐ Unknown
Foundation drainage water	☐ Yes	☒ No	☐ Unknown	Decorative Fountain pond	☐ Yes	☒ No	☐ Unknown
Other	☐ Yes	☒ No	☐ Unknown	Car Wash	☐ Yes	☒ No	☐ Unknown
Food Service/Restaurant/Bar				Film processing laboratory	☐ Yes	☒ No	☐ Unknown
Food processing	☐ Yes	☒ No	☐ Unknown	Laundry/dye works	☐ Yes	☒ No	☐ Unknown
Soda dispenser	☐ Yes	☒ No	☐ Unknown	Sewage/septic system	☐ Yes	☒ No	☐ Unknown
Other	☐ Yes	☒ No	☐ Unknown	Recreational vehicle dump station	☐ Yes	☒ No	☐ Unknown
Medical/Educational				Marina facilities	☐ Yes	☒ No	☐ Unknown
Medical facilities/hospital	☐ Yes	☒ No	☐ Unknown	Other	☐ Yes	☒ No	☐ Unknown
X-ray medical specialty	☐ Yes	☒ No	☐ Unknown	Miscellaneous			
Dental office/laboratory	☐ Yes	☒ No	☐ Unknown	Restricted entry to property	☐ Yes	☒ No	☐ Unknown
Laboratory/lab equipment	☐ Yes	☒ No	☐ Unknown	Morgue/mortuary/aspirator	☐ Yes	☒ No	☐ Unknown
Animal clinic	☐ Yes	☒ No	☐ Unknown	Dog groom	☐ Yes	☒ No	☐ Unknown
Other	☐ Yes	☒ No	☐ Unknown	Other	☐ Yes	☒ No	☐ Unknown

At least one Service is required when submitting a completed application

✓ CHECK FOR DEDICATED FIRE SERVICE, PLEASE ANSWER THE FOLLOWING QUESTIONS:

ALL FIELDS ARE REQUIRED

Service Size: INCHES **SFFD Approval is required, submit to CSB.**
Ex. 3 If multiple enter Quantity-Size: Ex. 2-1", 1-3"
Fire Department Connection? ☐ Yes ☒ No
Is system charged or intended to be a reclaimed water system? ☐ Yes ☒ No
Chemical additives? ☐ Yes ☒ No

✓ CHECK FOR DEDICATED IRRIGATION SERVICE, PLEASE ANSWER THE FOLLOWING QUESTIONS:

ALL FIELDS ARE REQUIRED

Service Size: INCHES Reclaimed Water for Irrigation? ☐ Yes ☐ No
Ex. 3 If multiple enter Quantity-Size: Ex. 2-1", 1-3"

✓ CHECK FOR STANDARD OR COMBINATION FIRE SERVICE, PLEASE ANSWER THE FOLLOWING QUESTIONS:

ALL FIELDS ARE REQUIRED

Service Size: INCHES Number of Floors:
Ex. 3 If multiple enter Quantity-Size: Ex. 2-1", 1-3"
Is the building 4 stories or more in height or have water supply greater than 40 feet above the water meter? ☐ Yes ☐ No
Use of Building: Will fire sprinklers use a "T" off domestic? ☒ Yes ☐ No
SFFD Approval is required, submit to CSB.

✓ CHECK FOR RECLAIMED SERVICE, PLEASE ANSWER THE FOLLOWING QUESTIONS:

ALL FIELDS ARE REQUIRED

Service Size: INCHES
Ex. 3 If multiple enter Quantity-Size: Ex. 2-1", 1-3"
Use of Building:

Contractor-1 is required

✓ CHECK FOR CONTRACTOR 1 / AGENT

☐ Check here to enter a new Contractor

ALL FIELDS ARE REQUIRED

Contractor:
Contact:
☐ Select if Signator
Contractor Type: GENERAL ☐ STANDARD ☐ COMBINATION ☐
FIRE ☐ IRRIGATION ☐ RECLAIMED ☐
#Agent only leave all unchecked

✓ CHECK FOR CONTRACTOR 2

☐ Check here to enter a new Contractor

ALL FIELDS ARE REQUIRED

Contractor:
Contact:
☐ Select if Signator
Contractor Type: GENERAL ☐ STANDARD ☐ COMBINATION ☐
FIRE ☐ IRRIGATION ☐ RECLAIMED ☐

✓ CHECK FOR CONTRACTOR 3

☐ Check here to enter a new Contractor

ALL FIELDS ARE REQUIRED

Contractor:
Contact:
☐ Select if Signator
Contractor Type: GENERAL ☐ STANDARD ☐ COMBINATION ☐
FIRE ☐ IRRIGATION ☐ RECLAIMED ☐

☐ CHECK FOR CONTRACTOR 4

For All Services: You must install one or more approved backflow preventers (backflow prevention assembly or air gap) within 25 feet of the water service point of connection. Backflow prevention assemblies must be on the current list maintained by the University of Southern California Foundation for Cross-Connection Control and Hydraulic Research. Assemblies must be installed in the approved configuration and may not be modified in any way. After you have installed a backflow preventer, you must call Water Quality Division (WQD) at (650) 852-3199 to schedule an initial inspection. A water service line and meter will not be provided until the backflow preventer has passed inspection. Within 48 hours of receiving water service, you must contact WQD for a final inspection and have backflow prevention assemblies tested. Note that fire service meters, which are installed on a bypass line attached to a backflow prevention assembly, are the property of the San Francisco Public Utilities Commission (SFPUC). A fee of at least \$1,584 will be charged if this meter is removed by anyone other than the SFPUC. (Authority: California Code of Regulations, Title 17, Section 7604; San Francisco Health Code, Article 12A; San Francisco Rules and Regulations, Section G)

The owner's/contractor's/responsible agent's signature will be required for approval.

I, Select Signator, AM THE (OWNER / CONTRACTOR / RESPONSIBLE AGENT) FOR THE PROPERTY AT THE ABOVE STREET ADDRESS AND I HAVE READ THE ABOVE AND I AGREE TO THESE TERMS.

DATE 06 / 16 / 2025

OWNER'S/CONTRACTOR'S/RESPONSIBLE AGENT'S NAME: *

ASK FOR CSB ASSISTANCE TO SUBMIT THE BFAT APPLICATION

FOR CSB USE ONLY

Comments:

No signature pad was available on 6/16/2025 at 11:24:04 AM .

- ☐ *Has the SFFD Approval been submitted?
- ☐ *Does the Agent's Signature or Name match the Signator Name?
- ☐ *Has the BFAT Form been filled out properly?
- ☐ * All CSB requirements have been submitted/fulfilled by the customer.



Water Quality Hazard Assessment Survey (Residential)

In order to fill out this form, you'll need to provide your name, service address, and an email or phone number that we can use to contact you. We will also ask for your water service account number, but if you don't know it you can still complete the form.

The San Francisco Public Utilities Commission, Water Quality Division, is reviewing all properties with water service accounts in San Francisco. The State of California requires this review to protect water quality. It will help the SFPUC know whether you have the right protection on your water service line.

Please provide the information requested below to help us better understand the water uses or activities on your property. We are asking this to make sure that your water uses do not pose a risk to the public drinking water system. Based on the results of this survey, you may need to install a special plumbing device on your property.

For questions or more information, please visit sfpuc.gov/backflow, email hazardassessment@sfwater.org, call (650) 652 3195, or visit our Frequently Asked Questions (<https://sfpuc.gov>).

If you do not provide this information, the SFPUC may be forced to require that you install a special plumbing device due to incomplete information

* Required

1. SFPUC Water/Sewer Account Number **(10-digit number)**

Enter your answer

2. Customer Name *

Enter your answer

3. Customer Type *

☐ Property Owner

☐ Other

4. Service Address **(might be different from your mailing address)** *

Enter your answer

5. Please provide your email so that we can send necessary updates. *

Please enter an email

6. Please provide your phone number so that we can send necessary updates. *

Enter your answer

7. Does the property have any of the following water uses or conditions? Please check all that apply. *

- ☐ Irrigation system (sprinklers)
- ☐ Boiler (does not include water heaters)
- ☐ Hydronic heating system (radiant floor heating)
- ☐ Fire protection (fire sprinklers)
- ☐ Backflow prevention assembly
- ☐ Well or graywater/rainwater recovery - Swimming Pool
- ☐ Well or graywater/rainwater recovery - Decorative Fountain
- ☐ Well or graywater/rainwater recovery - Pond
- ☐ Multiple service lines supplying the property
- ☐ Building height over 40 feet
- ☐ Other water-use equipment (excluding common household appliances)
- ☐ None of the Above
- ☐ Other

8. I verify that the information I have provided is true and correct to the best of my knowledge and that I am either the property owner or have the authority to respond as the account holder. *

- ☐ I agree.



Water Quality Hazard Assessment Survey (Commercial)

In order to fill out this form, you'll need to provide your name, service address, and an email or phone number that we can use to contact you. We will also ask for your water service account number, but if you don't know it you can still complete the form.

The San Francisco Public Utilities Commission, Water Quality Division, is reviewing all properties with water service accounts in San Francisco. The State of California requires this review to protect water quality. It will help the SFPUC know whether you have the right protection on your water service line.

Please provide the information requested below to help us better understand the water uses or activities on your property. We are asking this to make sure that your water uses do not pose a risk to the public drinking water system. Based on the results of this survey, you may need to install a special plumbing device on your property.

For questions or more information, please visit sfpuc.gov/backflow, email hazardassessment@sfwater.org, call (650) 652 3195, or visit our Frequently Asked Questions (<https://sfpuc.gov>).

If you do not provide this information, the SFPUC may be forced to require that you install a special plumbing device due to incomplete information.

* Required

Applicant Information

1. SFPUC Water/Sewer Account Number **(10-digit number)**

Enter your answer

2. Customer Name *

Enter your answer

3. Customer Type *

☐ Property Owner

☐ Other

4. Service Address **(might be different from your mailing address)** *

Enter your answer

5. Please provide your email so that we can send necessary updates. *

Please enter an email

6. Please provide your phone number so that we can send necessary updates. *

Enter your answer



Water Quality Hazard Assessment Survey (Commercial)

* Required

Type of Business

7. Does the property have any of the following water uses or conditions? Please check all that apply. *

- ☐ Biotech
- ☐ Business Park
- ☐ Car Wash
- ☐ Dry Cleaner
- ☐ Film Processing Laboratory
- ☐ Food Service/Restaurant/Bar
- ☐ Gas Station
- ☐ Hotel/Motel
- ☐ Laundry/Dye Works
- ☐ Manufacturing
- ☐ Marina Facilities
- ☐ Morgue/Mortuary/Aspirator
- ☐ Pet Grooming

- ☐ Dental Office/Laboratory
- ☐ Kidney Dialysis
- ☐ Laboratory/Lab Equipment
- ☐ Medical Facilities/Hospital
- ☐ Veterinary Clinic
- ☐ X-ray Medical Specialty
- ☐ None of the above
- ☐ Other



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Water Quality Hazard Assessment Survey (Commercial)

* Required

Water Uses and Property Conditions

8. Onsite Activity/Water Uses *

- ☐ Boiler (does not include water heaters)
- ☐ Decorative fountain/pond
- ☐ Dedicated irrigation service
- ☐ Fire service
- ☐ Food processing
- ☐ Heating other than forced air
- ☐ Hydronic heating/radiant heat
- ☐ Recreational vehicle dump station
- ☐ Sewage/septic system
- ☐ Soda dispenser
- ☐ Swimming pool
- ☐ Other water-use equipment (excluding common household appliances)
- ☐ None of the Above

9. List any other water-use equipment (excluding common household appliances)

Enter your answer

10. Unusual Plumbing or Property Condition *

- ☐ Dual plumbing
- ☐ Water storage tank
- ☐ Intricate plumbing/piping
- ☐ Multiple standard service connections
- ☐ Building 4+ stories or water use 40+ feet above water meter
- ☐ Restricted entry to property
- ☐ None of the Above

11. Auxiliary Water Supply *

- ☐ Recycled water provided by SFPUC
- ☐ Rainwater
- ☐ Graywater
- ☐ Groundwater
- ☐ Foundation drainage water
- ☐ None of the Above



Water Quality Hazard Assessment Survey (Commercial)

* Required

Verification

12. I verify that the information I have provided is true and correct to the best of my knowledge and that I am either the property owner or have the authority to respond as the account holder. *

☐ I agree.



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(4) Is there access to auxiliary water supplies, pumping systems, or pressure systems?	Yes	No

If yes, explain:

(5) Are there distribution system conditions that increase the likelihood of a backflow event? (e.g., hydraulic gradient differences impacted by main breaks and high-water demand situations, multiple service connections that may result in flow-through conditions)

Yes No If yes, explain:

(6) Premises accessibility: **Open access** **Restricted** **Critical water user** **Other:**

(7) Any previous backflow incidents on the user premises? Yes No Describe where incident documentation is kept:

(8) Degree of hazard: **High (contaminants or health hazard)** **Low (pollutants or non-health hazard)** **None**

(9) Have all hazards been properly identified? Yes No

I certify that all the information presented in this hazard assessment is true and accurate to the best of my knowledge and belief.

Signed

Date

Specialist Certification

Notes:

BACKFLOW INCIDENT REPORT FORM

Water system:

Date: _____ Time (if known): _____

Location (Address): _____

Premises contact name: _____ Title: _____

Phone: _____ Email: _____

Connection type:

- ☐ Industrial ☐ Commercial ☐ Single-family residential Multi-family residential Irrigation
☐ Recycled water ☐ Other:

How was the incident discovered?

Description and source of backflow incident (be as descriptive as possible):

***If available, please attach an MSDS
or other chemical description form*

Was the backflow fluid contained on the user side of the meter? ☐ Yes ☐ No

Estimated number of affected persons: _____

Number and description of consumer complaints received:

Did any consumers report illness? ☐ Yes ☐ No If yes, describe:

BACKFLOW INCIDENT REPORT FORM

Was SFDPH notified? ☐ Yes ☐ No If yes, describe:

INVESTIGATION

Describe investigation, including timeframes:

Area system pressure (measured): _____ System pressure within typical range? ☐ Yes ☐ No

Chlorine residual _____ ☐ N/A Comment: _____

Was a sample of the water contaminated by the backflow incident collected and analyzed? ☐ Yes ☐ No

Describe sampling:

Attachments included? ☐ Yes ☐ No

SWRCB recommends laboratory or field sampling for the following parameters: total coliform, E.coli, free and total chlorine residual, pH, odor, turbidity, temperature, and color. Additional sampling should be conducted at the PWS and regulatory agency's discretion.



Customer Service Bureau
San Francisco Public Utilities Commission
525 Golden Gate Avenue, San Francisco, CA 94102 • (415) 551-3000



Request to Purchase 2025 Backflow Tags

Form Valid December 1, 2024–June 30, 2025

To purchase 2025 backflow tags by mail, please fill out the information below, print out the form, and mail it with payment to the following address: Customer Service Bureau, San Francisco Public Utilities Commission, 525 Golden Gate Avenue, 2nd Floor, San Francisco, CA 94102. The request may also be deposited in the night mail box outside the entrance of 525 Golden Gate Avenue. (Office closed Monday, January 20th.) Tags will be returned by certified mail.

Company Name:

Mailing Address for Tags:

Number of tags requested: _____ @ \$27 each

Minimum purchase is 10 tags

= Payment Due

Purchases

Processing fee _____

Total Due

Form of Payment:

Make checks and money orders out to SF Water Department.

Note re returned checks: A fee of \$50 will be charged for each returned check. In addition, a hold will be placed on the company account, and all testers working for the company will be blocked from entering data into the CCAMS database until the check amount and \$50 returned-check fee have been paid.

Name: _____ Signature: _____ Date: _____

Contact information (required): _____ (telephone or email)



Customer Services Bureau
San Francisco Public Utilities Commission
525 Golden Gate Avenue, San Francisco, CA 94102 • (415) 551-3000



Request to Exchange 2024 Backflow Tags

Form Valid December 1, 2024–January 31, 2025

To exchange 2024 backflow tags for 2025 tags, please fill out the information below, print the form, and mail it with payment and tags to be exchanged to Customer Service Bureau, San Francisco Public Utilities Commission, 525 Golden Gate Ave, 2nd Floor, San Francisco, CA 94102. The request may also be deposited in the night mail box outside the entrance of 525 Golden Gate Ave. Deposit by 8 am for fastest service. (Office closed Monday, January 20th.) Tags will be returned by certified mail. Exchanges may only be made by mail. **Note: One exchange request per company.**

Company Name:

Mailing Address for Tags:

Exchanges

Each testing company may make a one-time exchange of up to one hundred 2024 backflow tags for an equivalent number of 2025 tags, provided that this form is postmarked by January 31, 2025.

Note: CSB is not responsible for tags before they are received at CSB.

Number of tags to be exchanged:

Maximum 100 tags

Payment Due

Exchange fee

Payment due

Form of Payment:

Make checks and money orders out to SF Water Department.

Note re returned checks: A fee of \$50 will be charged for each returned check. In addition, a hold will be placed on the company account, and all testers working for the company will be blocked from entering data into the CCAMS database until the check amount and \$50 returned-check fee have been paid.

Name: _____ Signature: _____ Date: _____

Contact information (required): _____ (telephone or email)

SFPUC Cross-Connection Control Program
Monthly Summary for the State Water Resources Control Board
For (Month and Year) _____

Negative Consumption/Documented Backflow into Public Water System, LOW OR NO HAZARD SERVICE CONNECTIONS ONLY

Address	Description of Incident	Action Taken

WQD investigations negative consumption indicated by AMI of 750 gallons or more per day.

Installation of Swivel-ElIs

Address of Swivel-ElI	Installation Date	Comments

Switchover of Swivel-ElIs to or from Potable Water

Address of Swivel-ElI	Date of Switch	Type of Switchover (to or from potable water)	Anticipated Date of Next Switchover	If Switch to Potable Water, Results of RP Test



Rules of Service and Operation

For Swivel-Ells

All property owners wishing to use a swivel-ell for containment protection when temporarily substituting tertiary recycled water use area with potable water from the SFPUC public water system must comply with the requirements of this notice.

Property owner:

Property owner contact (name, email, and phone number):

Address of swivel-ell:

Design and construction requirements:

1. The design and construction of the swivel-ell must conform to the requirements in the State Water Resources Control Board's *Cross-Connection Control Policy Handbook*. After Water Quality Division (WQD) approves the installation, no changes may be made to on-site plumbing without prior approval by WQD.
2. The swivel-ell connection must be designed to ensure that the water use site associated with the swivel-ell cannot be supplied concurrently by the public water system and auxiliary water. Therefore, the public water supply line and the auxiliary water supply line must be offset in a manner to 1) preclude the use of a tee-connection, spool, or other prefabricated mechanical appurtenance(s) in lieu of the swivel-ell connection, and 2) prevent concurrent supply of potable water and auxiliary water.
3. Only one source of auxiliary water may be used in conjunction with the swivel-ell assembly at a water use site.
4. An RP must be installed immediately upstream of the swivel-ell. The swivel-ell and RP must be located within 25 feet of the point of connection to the public water system. If this is not feasible, a second RP at the service connection is required.
5. The swivel-ell assembly must be:
 - Located above ground
 - Color-coded pursuant to California Health and Safety Code §116815 and its implementing regulations
 - Equipped with appropriate signage, as required by regulation and the SWRCB
 - Provided the security necessary to prevent interconnections, vandalism, unauthorized entry, etc.
 - Provided with meters on both the auxiliary water service and public water supply connections.

Operating Requirements:

1. Property owners must notify WQD at least 48 hours in advance of planned switchovers. For unplanned switchovers, property owners must notify WQD before the switchover is made and ensure that a WQD Inspector is present for the switchover. Contact WQD by calling Millbrae Dispatch at 650-872-5900 and asking to speak with a WQD Inspector.
2. A WQD Inspector must be present to supervise each switchover and will conduct a visual inspection of the swivel-ell immediately before each switchover. If the WQD Inspector identifies any changes made to the installation that would increase the hazard of the connection, the property owner must correct the deficiencies before the switchover may be made.
3. At the time of the switchover, property owners must give the WQD Inspector an estimate of the time until the next switchover.
4. If the switchover is from recycled water to potable water, the reduced pressure principle backflow prevention assembly (RP) associated with the swivel-ell must be tested by an Authorized Backflow Prevention Assembly Tester (Authorized Tester) within 72 hours of the switchover. The list of Authorized Testers is available at <https://www.sf.gov/reports--november-2023--find-certified-tester-your-backflow-assembly>.
5. After the switchover to potable water, the RP must be tested by an Authorized Tester at least every 12 weeks while the water use site is supplied with potable water. In addition, the RP must be tested annually, whether or not potable water is supplying the water use site. WQD will notify the property owner when testing is due.
6. Authorized Testers must enter RP test results into the SFPUC's MIS within five days of each test, unless the RP fails the test, in which case the results must be entered on the same day as the test. In addition, the Authorized Tester must inform WQD of the failure by calling Millbrae Dispatch at 650-872-5900 and asking to speak with a WQD Inspector. Depending on the type of failure, WQD may discontinue the potable water supply until the RP is repaired.
7. If asked to do so by WQD, property owners must provide WQD with potable water and recycled water usage information, as well as any other information WQD requests. The information must be provided within three business days.

Agreed to by
Property Owner:

Name and Position

Date: _____

Agreed to by
SFPUC/Water Quality Division

Andrew DeGraca, Manager

Dated: _____

DRAFT



Water Quality Division, Cross-Connection Control Program
1657 Rollins Road, Burlingame, CA 94010-2301 • (650) 652-3199 • backflow@sfgwater.org
Cross-Connection Control Program

WQD Inspection of Swivel-El

Date:

Property owner:

Address of swivel-el:

Reason for inspection:

☐ Initial Inspection ☐ Switchover ☐ Annual or Other Inspection

Date of previous inspection:

Current water source (before switch) (recycled or potable water):

If a switchover is to be made, estimated time until next switchover:

Does the installation conform to the design and construction criteria of the SWRCB Cross-Connection Control Policy Handbook? ☐ Yes ☐ No

Have any changes been made to the original installation of the swivel-el, appurtenances, or security arrangements? ☐ N/A ☐ Yes ☐ No

If yes, describe:

Corrective action required:

History of RP testing (if switch was to potable water):

Date of RP Test	Result	Requirement for Test (choose one)	
		Within 72 Hours of Switch to Potable Water	Every 12 Weeks from Start of Use of Potable Water

Comments:

WQD Inspector:

Certification #:

APPENDIX G

Guidance for Property Owners Upgrading Their Fire Services

To be prepared.

APPENDIX H

Tester and Specialist Certifying Associations Acceptable to the SFPUC

- American Backflow Prevention Association
- American Society of Sanitary Engineers
- American Water Works Association
- Northern California Backflow Prevention Association

APPENDIX I

2025 Instructions for Authorized Backflow Prevention Assembly Testers



Operating Procedures for Cross-Connection Control Program

2025 Instructions for Authorized Backflow Prevention Assembly Testers

The purpose of these instructions is to set forth the responsibilities of and requirements for backflow prevention assembly testers in the City and County of San Francisco (City). The instructions describe the requirements for operating in San Francisco, how to submit testing information, and how to communicate with the City departments involved in the Cross-Connection Control Program. Information provided by testers is used to maintain the Cross-Connection Control Program database and assists the City in creating new accounts and updating existing accounts. It is important that testers ensure the accuracy of reports and information submitted to the program.

These instructions are organized into the following sections:

- 1 Permit to Operate
- 2 Authorized Tester Responsibilities
- 3 Obtaining Backflow Tags
- 4 Establishing a CCAMS Account
- 5 Backflow Prevention Assembly Information Forms
- 6 New Installations
- 7 Assembly Clearance Requirements
- 8 Removal, Replacement, and Relocation of Backflow Prevention Assemblies
- 9 Plumbing Permits
- 10 “Requests” in CCAMS
- 11 Recording or Correcting Information in CCAMS
- 12 Submitting Test Information
- 13 Reporting Problems Observed in the Field
- 14 Consequences of Late Entry of Test Results
- 15 Violations and Penalties
- 16 Contact Information

1 Permit to Operate

Testers who operate within the City must obtain a permit to operate from the San Francisco Department of Public Health, Environmental Health Branch (SFDPH-EHB). Requirements for obtaining a permit are summarized below.

- All applicants for a permit to operate must hold a valid “Backflow Prevention Assembly Tester” certification from the American Water Works Association, American Backflow Prevention Association, American Society of Sanitary Engineers, or Northern California Backflow Prevention Association. Applicants must pay an initial application fee, pass an exam administered by SFDPH-EHB, and pay an annual license fee. The tester or the tester’s employer must maintain general liability insurance (described below) and

annually provide proof that any test kit used within the City has been calibrated. The permit to operate is issued to the tester, not the employer, and it is the tester's responsibility to keep the permit current.

- General liability insurance must be in full force and effect for all activities performed under a permit to operate, unless the permittee is a City employee. The insurance must include coverage for bodily injury, personal injury, including death resulting therefrom, and property damage (including water damage), with limits not less than \$2 million each occurrence combined single limit. The City, its officers, and employees must be named as additional insureds under the policy, and a cross-liability clause must be attached. The insurance must provide 10-day prior written notice of cancellation, non-renewal, or material change to SFDPH-EHB. SFDPH-EHB will not issue a permit to operate before receiving a certificate of insurance meeting these requirements. This requirement does not apply to testers who are City employees.
- To maintain a permit to operate, testers must be in good standing, have a current "Backflow Prevention Assembly Tester" certification from a recognized testing organization, have attended the annual tester meeting (or taken online training), maintain insurance, provide proof of use of a calibrated test kit, and pay the annual license fee. Fees are billed to individual testers or their employers through the City's Office of the Tax Collector.
- Permittees who change employment and continue to work in San Francisco must contact SFDPH-EHB and provide the following information:
 - End date with the previous employer and start date with the new employer.
 - Current certificate of liability insurance if the new employer does not already have one on file with SFDPH-EHB.
 - Updated contact information.
 - Completed form *Record Purpose Change to Authorized Backflow Assembly Tester Permit to Operate* (by tester)
 - Completed form *Authorized Backflow Prevention Assembly Testing Company Registration/Renewal Form*, if necessary (by test company).
 - Test kit calibration. Note that if a tester tests assemblies served by non-potable water (e.g., served by recycled water), a separate test kit must be used.
 - Copy of current backflow certificate/card, if it needs to be updated.
- Permittees who stop working in San Francisco permanently must contact SFDPH-EHB to close out their permits to avoid being incorrectly billed for annual license fees.
- A tester's permit to operate may be suspended or revoked for cause, for failing to comply with the requirements of Article 12A of the San Francisco Health Code, or for failing to pay the annual license fee.

2 Authorized Tester Responsibilities

- All testers must attend the Annual Meeting for Backflow Prevention Assembly Testers, hosted by the San Francisco Public Utilities Commission's (SFPUC's) Water Quality Division (WQD) and SFDPH-EHB. Alternatively, testers may complete an online training program. SFDPH-EHB will inform testers of how to access the program and the date by which it must be completed.
- Testers must attach backflow tags to assemblies that have passed testing and write the month and day tested on the tag. (See Section 3 for how to obtain tags.) Tags must be from the current year: even if the test due date was the previous year, the tag attached should reflect the year that the assembly was tested, not the year that testing was due. Note that if an assembly is delinquent, it might need to be tested twice in the same year to get it back on schedule.
- Bypass assemblies require separate test reports and backflow tags in addition to those for the main assembly. Note, however, that RPDA-II and DCDA-II assemblies are considered single assemblies and only require one test report and one tag.
- Testers are responsible for entering their own test data into the Cross-Connection Control Program's *Cross-Connection Assembly Management System* (CCAMS). (See Section 11 for how to submit test information.) Test results must be entered within five business days of the test date, **unless** an assembly fails testing and cannot be repaired the same day. In that case, test results must be entered into CCAMS **the day of the test** so that WQD is informed of the failure.
- All assemblies installed in San Francisco must be on the "Approved Backflow Prevention Assemblies" list developed by the University of Southern California (USC) Foundation for Cross-Connection Control and Hydraulic Research.
- **New in 2025:** All assemblies installed in San Francisco must be lead-free. Existing leaded assemblies that pass testing may remain in place.
- Assemblies must be installed in the orientation approved by USC. Any modification of an assembly—such as relocation of valves, bypass arrangements, and jumper connections, whether temporary or permanent—invalidates the foundation's approval and is not permitted. The only exception allowed by USC is that flanged shut-off valves 2.5 inches or larger may be rotated by one bolt hole. If a tester notices a modified assembly, the tester must immediately notify the Cross-Connection Control Program by telephone or email.
- If a tester observes backflow occurring, the tester must immediately notify the Cross-Connection Control Program by telephone or email.
- Testers **must submit test results electronically** via CCAMS. (Section 4 describes how to set up a CCAMS account.)

3 Obtaining Backflow Tags

- Backflow tags are sold by the SFPUC Customer Service Bureau (CSB), located on the first floor of 525 Golden Gate Avenue, San Francisco. Tags may be purchased by Authorized Backflow Prevention Assembly Testers or representatives of testing companies. CSB accepts payments by cash (in person only), company or cashier's check, and money order. (No personal checks or credit cards accepted.) Checks should be made out to SF Water Department.
- Hours of operation: 10:00 am to 2:00 pm. If these hours change, WQD will inform testers via CCAMS.
- To purchase tags in person, the buyer must provide official identification (e.g., driver's license), name of the company being represented, and payment. Tags obtained in person may be purchased in any amount.
- To purchase tags by mail, mail a purchase request form (link available at sfpuc.org/backflow) with payment to Customer Service Bureau, San Francisco Public Utilities Commission, 525 Golden Gate Avenue, 2nd Floor, San Francisco, CA 94102. The request may also be deposited in the night mail box outside the entrance of 525 Golden Gate Avenue. Deposit by 8 am for fastest service. CSB will mail the tags by certified mail within five business days of receiving the request. Mail orders require a minimum purchase of 10 tags.
- Backflow tag exchange: In December 2024 and January 2025, test companies may make a one-time exchange of up to one hundred 2024 backflow tags for an equivalent number of 2025 tags. Note that the allowed exchange is 100 tags per company made using one form, not 100 tags per tester. To make an exchange, fill out the "Request to Exchange Backflow Tags" (link available at sfpuc.org/backflow) and mail it to or drop it off at Customer Services Bureau with payment. The fee for an exchange is \$15, for any number of tags up to the maximum of 100. All exchanges must be made by mail.
- The cost of backflow tags through June 30, 2025, is \$27 each. The cost of tags purchased on July 1 or later will be \$30.

4 Establishing a CCAMS Account

- To access CCAMS, testers must have a current permit to operate. CCAMS allows testers to access test forms, submit test results, and see their test history at <https://CCAMS.sfpuc.org>.
- After being approved for a permit to operate, testers are emailed a password to be used with the email address provided.
- Testers who work for more than one company must have a separate email address and password for each company.
- Once a tester has a username and password, CCAMS can be accessed at <https://CCAMS.sfpuc.org>. Testers can only enter information into CCAMS for tests that they performed personally.

- It is recommended that testers add noreply@sfgwater.org to their email contact lists so that emails from CCAMS are not treated as spam.
- CCAMS also allows creation of one “supervisor” account per test company. Supervisor accounts give read-only access to all the test reports submitted by a given company. The person does not actually need to be a supervisor.

5 Backflow Prevention Assembly Information Forms

- All test results must be entered into CCAMS (not submitted on Backflow Prevention Assembly Information forms).
- A hard copy of the Backflow Prevention Assembly Information form is sent to customers along with the 30-day notice indicating that testing is due. Testers can use this form as a reference for information pertaining to the backflow prevention assembly to be tested. The notices also include the customer’s personal identification code (PIC) and the service point identification (SPID) number associated with the assemblies at a given service address.
- CCAMS accepts customer accounts, which allow customers to receive test notices by email and to choose one or more preferred test companies and have those companies notified by email when their assemblies are due for annual testing. This feature eliminates the need for customers to provide their preferred testers with PIC numbers.
- Testers can either download Backflow Prevention Assembly Information forms from CCAMS or obtain them from the customer. To download the forms from CCAMS, testers must obtain the PIC number(s) from the customer.
- If a customer cannot locate PIC number(s), then the customer may obtain the PIC number(s) or preprinted test forms by calling (650) 652-3199 or by emailing backflow@sfgwater.org. To access an account, the customer must have the SPID number or service address (for multiple taps). Only the customer, not the tester, may obtain PIC numbers directly from WQD if the 30-day notice is sent to a San Francisco address.
- Customers may authorize their testers via email to get PIC numbers directly from WQD. If you notify your customers via email that their assemblies need testing, copy backflow@sfgwater.org on the original message and ask the customer to “reply all” to authorize the release of the numbers. PIC numbers will be emailed to testers within one working day.
- Alternatively, if a tester can provide WQD with written proof of customer authorization for testing (testing contract, email correspondence between tester and customer), WQD may release PIC numbers directly to testers.
- If a 30-day notice is sent to an “accounts receivable” department outside of San Francisco, or a tester has a contract with an out-of-city customer to perform annual testing, the tester may call WQD in the month that a site is due for testing to obtain PIC numbers to allow downloading of the forms from CCAMS. This exception is made so that testers can proceed with testing for out-of-city customers in a timely manner. Note, however, that staff may contact the customer before releasing PIC numbers.

- If a customer needs to obtain PIC numbers at a time not associated with annual testing, for example, because a leaking assembly needs repair, the customer may call WQD at (650) 652-3199 or email backflow@sfgwater.org. To access his or her account, the customer must have the SPID number or service address (for multiple taps).

6 New Installations

- New installations must be entered into CCAMS on the “Assembly Management/Add Assembly” tab. Note that this form should only be used in three cases:
 1. An assembly is newly installed at a specific location and is not a replacement for a previous assembly at that location.
 2. An assembly does not have a backflow tag. In that case, inform the customer and ask for permission to test the assembly. If the customer does not agree to testing, email backflow@sfgwater.org and provide location, make, model, and serial number of the assembly, as well as the hazard. WQD will send the customer a notice to test the assembly.
 3. An assembly is not on the site’s paperwork but has an out-of-date backflow tag. Please call or email WQD and provide the assembly’s make, model, serial number, and service address to find out whether the assembly is in CCAMS or should be added as a new installation.
- Note that if an assembly is in violation of installation requirements (modified, not on USC list, wrong orientation, etc.) and cannot be tested, check the “In-Violation” box under the “Unable To Test” section and **do not test it**. If possible, take at least two pictures of the assembly, one closeup (including the make, model, and serial number) and a second showing the violation. Upload the pictures to CCAMS on the “Assembly File Upload” screen, which appears after assembly information has been entered and “Create” has been clicked.
- Whether or not an assembly gets tested, ask the customer for a plumbing permit number. In most cases, the permit will be from the San Francisco Department of Building Inspection, Plumbing Inspection Division (SFDBI-PID). However, if the facility falls under another jurisdiction (listed in Section 8 of these instructions), the permit/approval number will be from the authority having jurisdiction.
- Enter the meter number, if known, on the New Installation form in CCAMS. This information is important for associating the correct customer with a particular backflow prevention assembly.
- Select whether the assembly is for containment (protection of the public water system) or isolation (protection of water users within the premises). Select the hazard from the drop-down menu, which differs depending on whether the assembly is for containment or isolation. Consider asking the building owner or building manager what the assembly is supplying water to if it isn’t obvious. If you don’t know the hazard, select “Other.”
- Be sure to put in the assembly orientation. The dropdown menu on the New Installation form only includes USC-approved orientations. If a correct orientation is not shown in

the dropdown menu, email backflow@sfgwater.org. If the orientation is confirmed on the USC website, WQD will add the orientation to CCAMS.

- Under “Exact Assembly Location,” be as specific as possible (e.g., “Building B, 2nd Floor, north wall utility closet J2”; “Basement, 25 feet east of the northeast corner, below stairwell”). If the assembly is in a multi-unit building, be sure to enter the unit number.
- If possible, take at least two pictures of the assembly and upload the pictures to CCAMS, as described above.

7 Assembly Clearance Requirements

- WQD enforces installation requirements for containment assemblies (at the meter).
 - As required by the Cross-Connection Control Policy Handbook, assemblies must have 12 inches of clearance on three sides and 24 inches of clearance on the side with the test cocks.
 - Assemblies must be installed at least 12 inches above grade but not more than 36 inches above grade.
 - Assemblies may not be installed below grade in pits, vaults, or confined spaces.
 - If clearance does not meet these specifications, but the assembly can still be tested safely and accurately, testers should go ahead and test. However, when entering test results into CCAMS, please note the inadequate clearance in the comments field.
- DBI enforces installation requirements for isolation assemblies.
 - California Plumbing Co §603.4.3 requires adequate clearance for testing, maintenance, and repair but only specifies 12 inches of clearance below the assembly.
 - Assemblies installed more than 5 feet above grade require a platform.
 - If clearance is inadequate but the assembly can be tested accurately, testers should go ahead and test. Please note inadequate clearance (or lack of a platform) in the comments field when entering test results into CCAMS.

8 Removal, Replacement, and Relocation of Backflow Prevention Assemblies

- Only a licensed contractor may remove, replace or relocate a backflow prevention assembly. A plumbing permit for the work must be obtained from SFDBI-PID, unless the facility falls under a different jurisdiction (e.g., California Department of Health Care Access and Information [formerly, OSHPOD] or the State Fire Marshal). In that case, a permit or other authorization must be obtained from the relevant entity. Section 9 provides more details about plumbing permits.
- Enter plumbing permit numbers into CCAMS or ask owners to provide permit numbers to WQD by email or phone.
- Report the removal of a backflow prevention assembly in CCAMS by choosing “Unable to Test” and then “Removed.” Include the plumbing permit number if you have it. If the removed assembly was replaced with another assembly, follow the instructions in the next bullet point.

- Report the replacement of a backflow prevention assembly in CCAMS. If the assembly being removed or replaced was tested, be sure to record the results of the test in the “Initial Test” area of the form. For the new assembly, go to the old assembly test form, mark the check box next to “Replacement Information Below,” and enter the replacement assembly information in the fields below. Then record the test results for the new assembly in the “Final Test” area of the form.

It is important that the information for both the old and new assemblies be reported on the same form. That way, the customer will have the correct serial number and associated backflow prevention assembly inactivated, and the old and new assemblies will be tied together in CCAMS.

Sometimes, a replacement assembly is not installed for months after the removal of the original assembly. Even if you know that an assembly will be replaced in the future—for example, as part of a remodel—report the removal of the original assembly as soon as you are aware of it. If you test the replacement assembly sometime later, do not enter it as a new installation. Send an email to backflow@sfgwater.org, and WQD will reactivate the original assembly in CCAMS. Then enter test results for the new assembly on the replacement screen.

- Replacement of assemblies having a bypass with an RPDA-II or DCDA-II (or vice versa): CCAMS treats an assembly with a bypass assembly as two separate assemblies, each of which requires its own test report and backflow tag. However, RPDA-II and DCDA-II assemblies are considered single assemblies and only require one test report and one tag.
 - If an assembly with a bypass is replaced with an RPDA-II or DCDA-II, then report the new assembly on the same form as the removed mainline assembly. Report the removal of the bypass assembly separately by selecting “Unable to Test” and then “Removed.”
 - If an assembly without a bypass is replaced with an RPDA-II or DCDA-II, then a single form is used to report the replacement.
 - If an RPDA-II or DCDA-II is replaced with an assembly having a bypass, then report the new mainline assembly on the same form as the removed RPDA-II or DCDA-II, and report the new bypass assembly as a new installation.
- If possible, take at least two pictures of the replacement assembly, one closeup (including the make, model, and serial number) and a second one showing the installation. Upload the pictures to CCAMS on the “Assembly File Upload” screen, which appears after test results have been entered and “Create” has been clicked.

9 Plumbing Permits

- Most plumbing permits for work in San Francisco must be obtained from SFDBI-PID, although some facilities might fall under a different jurisdiction (e.g., California Department of Health Care Access and Information [formerly, OSHPOD] or the State Fire Marshal). In that case, a permit or other authorization must be obtained from the relevant entity.
- SFDBI-PID permits can be obtained online at <https://sfdbi.org/onlinepermit>. For support, email DBIOnlineServices@sfgov.org or call (628) 652-3240 (Central Permit Bureau).
- Plumbing inspections by SFDBI-PID can be scheduled several ways:
 - Online: <https://sfdbi.org/inspection-scheduling-procedures>.
 - By calling SFDBI-PID's scheduling number, (628) 652-3401, which allows you to schedule, reschedule or cancel an inspection, as well as obtain results, 24/7.
 - By calling Inspection Services at (628) 652-3400 between 7:30 am and 3 pm.
- When filling out a plumbing permit application, provide as much detail as possible, and be sure to specify:
 - Location of the backflow prevention assembly, hazard (e.g., boiler, fire system), and assembly serial number. If possible, include the assembly type, make, and model.
 - Whether the permit is for a new installation, removal, replacement, or relocation.

10 “Requests” in CCAMS

Testers can enter several types of requests on the Test Management/PIC Search screen. In the first column, under “Actions,” is a link for “Requests.” Clicking the link pulls up a submenu with six options: Unlock–Correction Photos, Unlock–Permit Violations Only, File Upload, Correcting Assembly Errors, Duplicate Assembly, and Others. These options are described below.

- **Unlock–Correction Photos:**
Choose this option to request unlocking of an assembly referred to SFDPH because of a physical (non-permit) violation. You will be required to upload at least two pictures—one closeup (including the make, model, and serial number) and a second wide angle showing the correction—and other supporting information that will be reviewed by WQD.
- **Unlock–Permit Violations Only:**
Choose this option to request unlocking of an assembly referred to SFDPH because of the lack of or an expired permit for an assembly installation or replacement. You will be required to provide the plumbing permit number with this request.
- **File Upload:**
Choose this option to upload files or photos. All file uploads will be reviewed by WQD. Describe what is being uploaded and your reason for doing so. The maximum file size for uploads is 4 MB, and up to five files can be uploaded at one time.
- **Correcting Assembly Errors:**
Choose this option to report corrections to assembly or site information. Please provide sufficient detail for WQD to be confident of the correction.

- Duplicate Assembly:
Choose this option to report duplicate assemblies. Please provide the reason you believe the assembly is a duplicate.
- Others:
Choose this option for requests besides the ones mentioned above.

11 Updating or Correcting Information in CCAMS

- Testers can request updates or corrections to CCAMS as described in Section 10 above. Updates/corrections can also be requested in the “Comments” field of the test report.
- Customers can update information (name or mailing address) by contacting CSB at (415) 551-3000. Information will then be updated in CCAMS by the following Monday morning.
- Customers can provide WQD with preferred contact information that is different from their billing contact information by contacting WQD at backflow@sfwater.org.
- Customers can change a test date to another month or synchronize multiple accounts by contacting WQD.

12 Submitting Test Information

- Test results must be entered into CCAMS within five business days of the test date **unless** an assembly fails testing and cannot be repaired the same day. In that case, test results must be entered into CCAMS **the day of the test** so that the Cross-Connection Control Program is informed of the failure.
- After entering test results into CCAMS, testers have a five-day window for modifying the results. If modifications need to be made after five business days, a tester must contact WQD to have the test canceled. The tester may then reenter the test information. Note that a “fail” result causes an assembly to be automatically routed to SFDPH-EHB for enforcement action. However, entering a subsequent “pass” result returns an assembly to normal status. Once a “pass” result is entered for an assembly, the test’s PIC number can no longer be used to access that assembly in CCAMS.

13 Reporting Problems Observed in the Field

- If a backflow prevention assembly fails a test, record the test results in the “Initial Test” results area of the test form. Then contact the customer and request authorization to repair the assembly or recommend that it be replaced. If the assembly cannot be repaired or replaced the same day, test results must be entered into CCAMS **the day of the test** so that the Cross-Connection Control Program is informed of the failure.
- Unable to test: If an assembly cannot be tested, for example, because it is temporarily inaccessible or has no water supply, inform the customer and enter the cause on the Test Management/PIC Search/Unable to Test screen. As of 2024, new option “Untestable” is available with a dropdown menu of reasons: No Access Provided, No Water, Unable to Locate.

- Unable to test: If a backflow prevention assembly has been modified or incorrectly installed (e.g., illegal by-pass, relocated shut-off valve, or wrong orientation), take pictures of the assembly showing the violation and report the violation in CCAMS **on the day of the inspection** by checking “Unable to Test” and then “In Violation.” Select all relevant violation types, click “Submit,” and upload pictures on the “Assembly File Upload” screen that appears. The assembly will be locked in CCAMS so that only the CCAMS Administrator can access the assembly’s record. Test results cannot be entered until the Cross-Connection Control Program receives evidence that the violation has been corrected.
- After the violation has been corrected, take at least two pictures of the assembly, one closeup with make, model, and serial number and a second one showing the correction. Upload the pictures to CCAMS by clicking “Requests” in the second column of the Test Management/PIC Search screen and then selecting “Unlock–Correction Photos.” After an unlocking request has been approved, if the assembly needs to be tested, CCAMS will generate an email to the tester with a PIC number.

After the correct installation has been verified, the tester will receive a notice via CCAMS with a PIC number for the unlocked assembly and will be able to submit test reports.

- Unable to Test: If an assembly is in violation because of a missing or expired plumbing permit, the tester can enter the permit number by clicking “Requests” in the second column of the Test Management/PIC Search screen and then selecting “Unlock–Permit Violations Only.” Alternatively, the contractor or customer must email a valid permit number or copy of a valid plumbing permit to *backflow@sfwater.org* to have the assembly unlocked.
- If a tester finds a cross-connection hazard that is unprotected, that is, with no backflow prevention assembly or the wrong type of assembly, the tester must inform the customer of the hazard and the potential health risk associated with it. Email *backflow@sfwater.org* or, if the hazard has no protection at all, call (650) 652-3199. An assembly that is the wrong type for the hazard should not be tested.
- If a tester finds an existing backflow prevention assembly that is not tagged, follow the procedures described in Section 6, New Installations.
- Contacting Cross-Connection Control Program staff from the field can save you time and resources; often, questions can be answered or issues rectified on the spot. In addition, vital information that you might not otherwise know to record might be needed from the site.

14 Consequences of Late Entry of Test Results

If test results for a given month are not entered into CCAMS by the 6th of the following month, the database automatically generates a second notice of testing due, and the customer might receive this notice after having paid for testing. If this happens, testers should confirm that the test results were submitted to CCAMS and explain the situation to the customer. Customers can

call Cross-Connection Control Program staff at (650) 652-3199 to check on the compliance status of their accounts.

15 Violations and Enforcement

Testers must fulfill all their responsibilities described in these instructions. Tester permits to operate may be suspended or revoked for violations including, but not limited to:

- Failure to maintain valid certification as a “Backflow Prevention Assembly Tester” from a recognized testing organization.
- Failure to maintain required liability insurance.
- Failure to provide proof of use of a calibrated test kit.
- Failure to pay annual license fee.
- Late entry of test results (more than five business days after test).
- Failure to submit accurate test reports.
- Failure to attend annual meetings or complete online training.
- Failure to follow testing procedures in the USC Foundation for Cross-Connection Control and Hydraulic Research *Manual of Cross-Connection Control*, 10th edition (or latest edition), for example, testing an assembly that has been modified or installed in an incorrect orientation.
- Falsification of test results, for example, entering the wrong date so as to appear to be submitting results within five business days of testing.

Enforcement may include warning letters, notices of violation, citations to conferences or administrative hearings, or permit revocation.

16 Contact Information

Water Quality Division	
Cross-Connection Control Program Water Quality Division San Francisco Water, Power and Sewer 1657 Rollins Road Burlingame, CA 94010 (650) 652-3199 Utility Services Representative backflow@sfgwater.org (650) 652-3214 or (650) 652-3108	• Plumbing permit submission (if not submitted in CCAMS) • Photos/correspondence for assemblies that have been modified or whose records are locked in CCAMS • CCAMS technical issues • PIC number(s) or preprinted test forms • Changing/synchronizing test months (customers) • Questions about testing notices or other general cross-connection control issues • Questions about backflow tags
CCAMS website: https://ccams.sfpuc.org/ WQD Cross-Connection Control Program website: sfpuc.gov/backflow or sfpuc.gov/backflow-testers SFPUC's main website with consumer information and Water Quality Reports: sfpuc.gov/	

Department of Public Health, Environmental Health Branch	
Cross-Connection Control Program Environmental Health Branch San Francisco Department of Public Health 49 South Van Ness Avenue, Suite 600 San Francisco CA 94103 Arthur Duque, Senior Environmental Health Inspector Cross.Connection@sfdph.org (415) 252-3966	• Permits to operate (obtaining and cancelling) • Tester certification updates • Certificate of liability insurance • Test kit calibration documentation • Updating test company and tester contact information • Test company registration/renewal • Questions about notices of violation
SFDPH Cross-Connection Control Program website: https://www.sf.gov/information/test-your-backflow-prevention-assembly-protect-drinking-water SFDPH Authorized Backflow Tester List: https://www.sf.gov/backflow	

Department of Building Inspection, Plumbing Inspection Division	
San Francisco Department of Building Inspection 49 South Van Ness Avenue, Suite 400 San Francisco, CA 94103 (628) 652-3400 ext. 1 https://sf.gov/departments/departments-building-inspection Automated Inspection Scheduling: (628) 652-3401	• Plumbing permit assistance and scheduling • Exceptions: Facilities that fall under the Port of San Francisco, California Department of Health Care Access and Information, Division of the State Architect, or the State Fire Marshal
SFDBI-PID Instant Online Permit website: https://sfdbi.org/onlinepermit SFDBI-PID Permit tracking website: http://dbiweb.sfgov.org/dbipts/	

APPENDIX J

SFPUC's Approved Swivel-Elbow Sites

To be prepared.

APPENDIX K

Requirements for Documenting Cross-Connection Tests

WQD Requirements for Documenting Cross-Connection Tests

Site Information

- Location/site name
- Address
- Property owner and contact information
- SPID number(s)
- Number of floors
- Square footage
- Types of water use, current and future (post-CCC test), e.g., potable water and municipally supplied recycled water/onsite treated water. For onsite treated water, source of water to be treated.
- Proposed uses of recycled or onsite treated water (e.g., irrigation, toilets/urinals, cooling tower makeup water)

Test Results

- Test date(s)
- Name and certification of Cross-Connection Control Specialist responsible for the test
- Name of site supervisor and attestation that he or she was present during the test
- Signatures of Cross-Connection Control Specialist and site supervisor
- Name of WQD Inspector, if present
- Type of test: shutdown, dynamic pressure differential, static pressure differential
- For shutdown tests, for each system (potable/non-potable):
 - Number and type of fixtures
 - Schematic of each floor or area
 - Start time for draining system
 - Start time of fixture verification
 - End time
 - Results for each area tested: pass or fail
- For pressure differential tests:
 - Locations of pressure gauges/pressure recorders and areas tested
 - For each test area:
 - Start and end time
 - Initial pressure
 - Test pressure
 - Opposite system pressure
 - Results for each area tested: pass or fail

APPENDIX L

Details of SFPUC's Enforcement Process

Enforcement Procedures for Property Owners

L.1 Introduction

Article 12A of the San Francisco Health Code requires that property owners have their BPAs tested annually. Testing is also required after installation, relocation, repair, or whenever an owner is notified by the SFPUC to test a BPA. In addition, upon written notification by SFPUC or SFPD-PH-EB, a property owner must eliminate unprotected cross-connections within seven days of receipt of the notification, unless an alternate deadline for remediation is specified.

L.2 Enforcement Options

If a property owner does not comply with cross-connection control requirements, Article 12A of the San Francisco Health Code authorizes SFPUC to take any of the following measures:

- Install a flow restrictor, with applicable fees, on all non-fire service lines until the cross-connection has been eliminated.
- Disconnect a noncompliant water service(s) until the cross-connection has been eliminated (for domestic water services only).
- If the noncompliant water service is a fire service, disconnect the associated domestic water service until the cross-connection on the fire service has been eliminated.
- Any other action deemed necessary by WQD and/or SFPD-PH-EH to protect the public water system.

In addition to the measures above, property owners who violate any provisions of Article 12A of the San Francisco Health Code or any rule or regulation pursuant to Article 12A are subject to enforcement in accordance with Chapter 100 of the San Francisco Administrative Code with respect to administrative penalties and any other available legal remedies. Each day a violation is committed or allowed to continue constitutes a separate violation, and the amount of the fine may be up to \$1,000 per violation per day.

If SFPUC determines that an existing or potential unprotected cross-connection poses an imminent risk of hazard to the public water system and requires immediate abatement, the SFPUC will immediately shut off water service to the property at the meter until the cross-connection has been eliminated, as described above.

L.3 Enforcement Process

SFPUC works with customers to achieve compliance before pursuing service shutoff or installing a flow restrictor on the water line. However, if deemed necessary, SFPUC will take all appropriate measures to protect the public water supply. The process for ensuring compliance with testing requirements is described below and illustrated in Figure L-1.

- 30 days before testing is due for a BPA, SFPUC sends the property owner a notice.

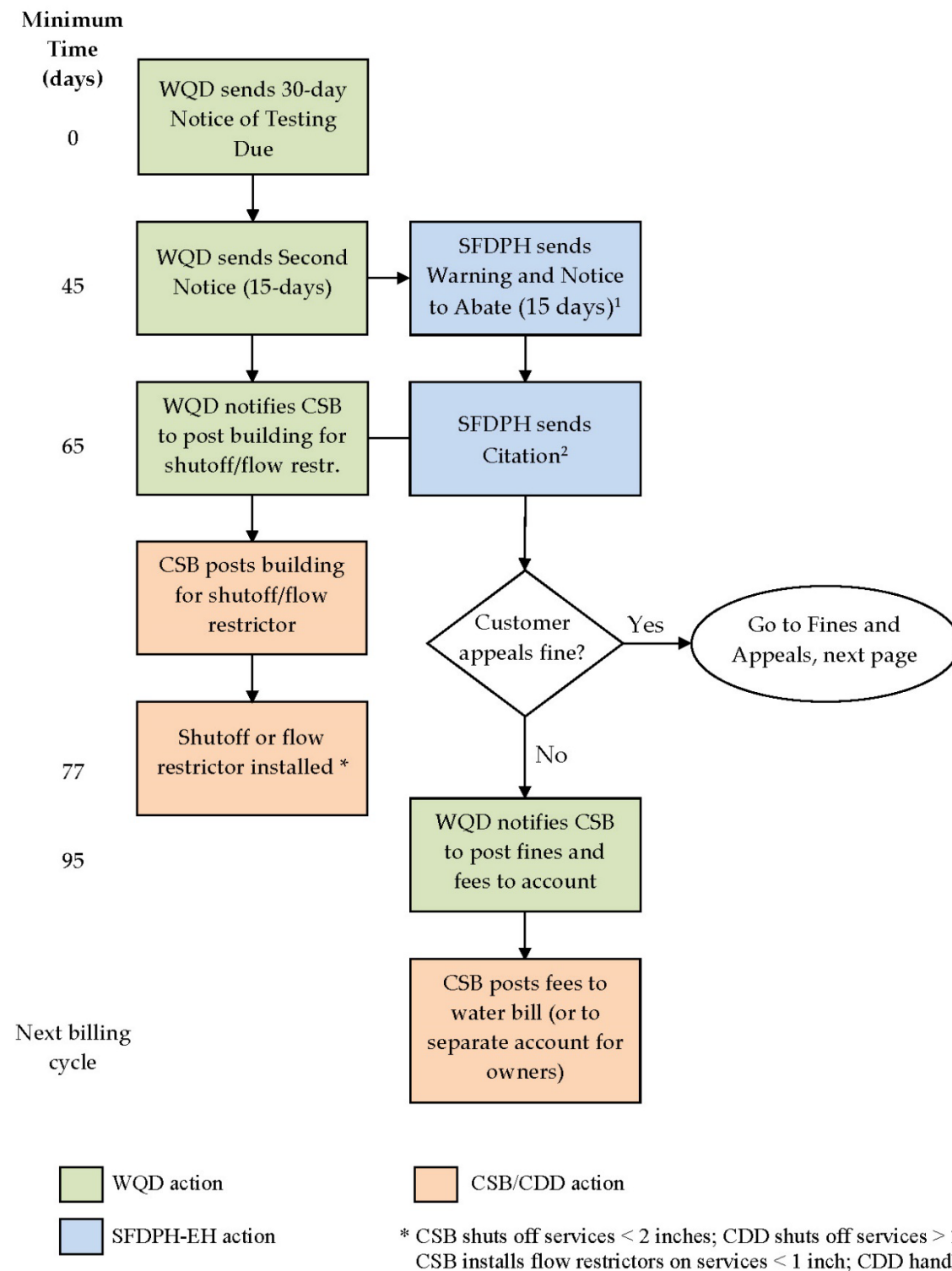
- If SFPUC has not received test results by the due date, SFPUC sends a second notice indicating that test results are due within 15 days, and the case is referred to SFDPH-EH.
- Upon referral, SFDPH-EH sends the property owner a Notice to Abate.
- If testing results are not received by the date specified in the Final Notice, SFDPH-EH issues the property owner an Administrative Citation, which indicates fines for which the property owner is liable. Depending on the risk to the water system posed by the violation, fines may be up to \$1,000 per day that a BPA is in violation.
 - In usual circumstances, the fine for RPs, RPDAs, RPDA-IIs, PVBs, and SVBs is \$200 per day per BPA that is out of compliance (i.e., each day a BPA is not tested after the date noted on the SFDPH-EH Final Notice).
 - In usual circumstances, the fine for DCs, DCDAs, and DCDA_IIs is \$100 per day per BPA that is out of compliance.
 - Fines may be paid by check made out to the San Francisco Water Department. Fines unpaid after 30 days are posted to the water customer's water bill. If the water customer is not the property owner, then the fines are posted to a separate account for billing to the property owner.
- Payment of fines does not exempt a property owner from complying with the testing requirements. If a property owner does not comply with testing requirements by the date specified in the Final Notice, SFPUC initiates the process for service shutoff or installation of a flow restrictor, as applicable.
 - Buildings associated with the noncompliant BPA(s) are posted with a 10-day Notice of Shutoff.
 - If SFPUC does not receive proof of testing by the date on the Notice of Shutoff, water service is shut off or a flow restrictor installed, as applicable. Full water service will not be restored until test results have been received.

L.4 Due Process

If a property owner does not agree with the fines set forth in the Administrative Citation, the property owner may elect to schedule a Voluntary Conference with the SFDPH-EH Senior Inspector to provide additional information about the case.

If, after a Voluntary Conference, the property owner does not agree with the resolution or penalties proposed in the Voluntary Conference, the case may be appealed at an Administrative Hearing. At the hearing, the Hearing Officer accepts information from the enforcement agencies as well as the property owner. The Hearing Officer makes a determination about whether the violation exists or existed and may uphold, waive, or modify the penalties proposed by SFDPH-EH.

Decisions regarding fines and penalties made at an Administrative Hearing are further appealable to the San Francisco Superior Court. The appeals process is illustrated in Figure L-2.

**Figure L-1. Enforcement Process**

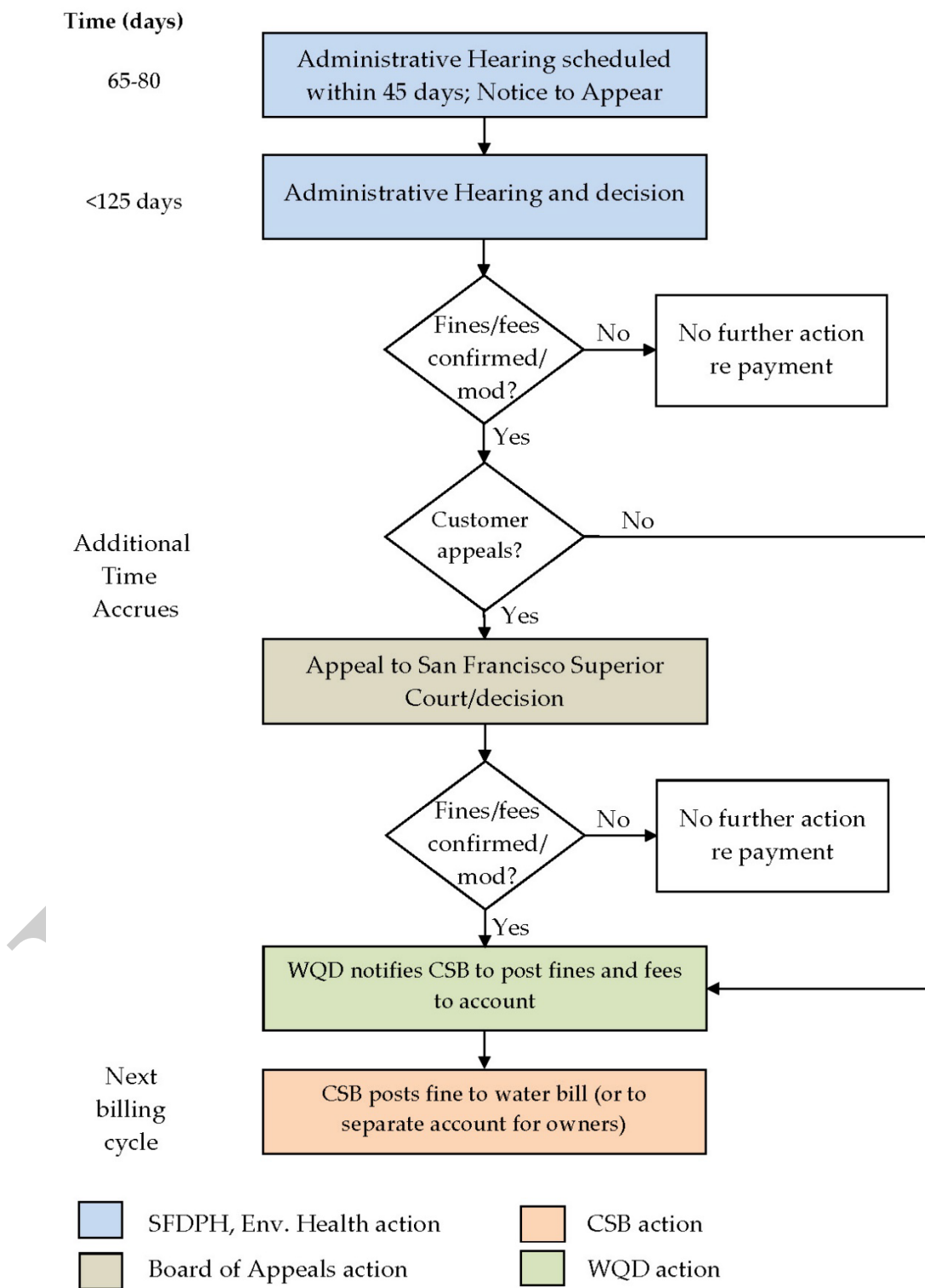


Figure L-2. Appeals Process