State Water Resources Control Board

TO: PUBLIC WATER SYSTEMS AND
LOCAL ENVIRONMENTAL HEALTH PROGRAMS

FROM: Cross-Connection Control Committee
DIVISION OF DRINKING WATER

DATE: September 17, 2025

SUBJECT: GUIDANCE ON CROSS-CONNECTION CONTROL POLICY HANDBOOK REQUIREMENTS FOR FIRE PROTECTION SYSTEMS

Introduction

On December 19, 2023, the Cross-Connection Control Policy Handbook (CCCPH) was adopted by the State Water Resources Control Board (State Water Board) with an effective date of July 1, 2024. The CCCPH replaced the regulations on backflow and cross-connection control that were in Title 17 of the California Code of Regulations. (Health & Saf. Code, § 116407, subd. (c).) Public water systems (PWSs) must comply with the CCCPH. (Health & Saf. Code, § 116555.5.) Amendments to the CCCPH were adopted in March 2025 and June 2025. Backflow protection requirements on fire protection systems were not impacted by these amendments.

The CCCPH includes specific backflow protection requirements for PWSs serving water to users with fire protection systems such as fire sprinklers. The purpose of this memorandum is to provide guidance on how PWSs can best comply with the CCCPH's backflow protection requirements applicable to fire protection systems.

Background

Before the CCCPH took effect, PWSs were subject to the backflow protection requirements in Title 17 of the California Code of Regulations. Section 7604 of title 17 of the California Code of Regulations required double check valve backflow preventers (DC), reduced pressure principle backflow preventers (RP), or air gaps for fire sprinklers depending on if the premises (use site) had auxiliary water or recycled water or if there were elevated tanks or pumps. The regulations did not have specific requirements for use sites without auxiliary water, recycled water, elevated tanks, or pumps.

Some PWSs serving water to users with fire sprinkler systems did not need to comply with the applicable Title 17 backflow protection requirements because they were statutorily exempt pursuant to Health and Safety Code section 13114.7, subdivision (b). The statute exempts backflow preventer installation in AWWA-defined Class 1 and Class 2 fire sprinkler systems. Class 1 and Class 2 fire sprinkler systems were described in in the 1st and 2nd Editions of the AWWA M-14 Manuals when classes were used to classify fire sprinkler systems based on water source and arrangement of supplies (AWWA, 1973; AWWA, 1989; USC, 1993). The AWWA classification system for fire sprinklers is no longer in use, as some Class 1 or 2 fire sprinkler installations pose cross-connection risks and should have backflow protection (AWWA, 2004; Cal Fire, 2009; USC-FCCHR, 1993). Class 1 fire sprinkler systems were automatic fire sprinklers with direct connections from public water mains only, i.e. no pumps, tanks, or reservoirs, no physical connection from other water supplies, no antifreeze or additives of any kind, and all sprinkler drains discharged to atmosphere or other safe outlets. (Health & Saf. Code, § 13114.7.) Class 2 fire sprinklers were similar to Class 1 fire sprinklers, except that booster pumps may be installed in the connections from the street mains. (Health & Saf. Code, § 13114.7.) The statute is still in effect, therefore it is possible that a PWS serving water to users with fire protection systems falls under the exemption. This is discussed in more detail below.

How to determine whether a PWS serving water to users with fire sprinkler systems is statutorily exempt under Health and Safety Code section 13114.7 from the CCCPH's backflow protection requirements?

If a PWS believes that a water user's fire sprinkler system is statutorily exempt from the CCCPH's backflow protection requirements for fire sprinkler systems pursuant to Health and Safety Code section 13114.7, then the State Water Board recommends the PWS reach out to its local fire authorities to determine whether it falls within the exemption. If the local fire authorities determine that the exemption applies, then the PWS should provide this documentation to the State Water Board.

What are the Sanitary Concerns of Fire Sprinklers?

Generally, the concerns with fire sprinkler installations include stagnant water and associated water quality impacts, pipe materials that may leach into the water, and use of chemical additives such as antifreeze. Use of antifreeze or other chemical additives in fire sprinklers systems have long been recognized as a contamination hazard that requires installation of an RP for containment. During backflow events, there is a risk that stagnant water and/or chemicals in the fire sprinkler piping may enter the distribution system and impair the drinking water supply.

Stagnant water in fire sprinkler systems that backflows into drinking water may cause the PWS to violate drinking water standards. Stagnant water is a pollutant (i.e. aesthetic

concern) but in some cases may also be a health concern due to the potential for heavy metal leaching and/or microbial growth (as discussed below).

The AWWA Research Foundation describes studies that show black steel pipe can leach heavy metals, including lead, into the water contained within a fire sprinkler system. (Duranceau et al.,1998.) While the volume of water that can backflow from a fire sprinkler system could be limited to a small area of the distribution system, there is a risk that customers receive water with elevated lead concentrations. The US EPA determined that there is no safe level of lead exposure and requires PWSs to take necessary steps for the protection of public health when the concentration of lead in drinking water reaches the US EPA action level of 15 ppb (US EPA, 2021). Additionally, in compliance with the California Safe Drinking Water Act (Health & Saf. Code, division 104, part 12, chapter 4, commencing with section 116270), PWSs have a duty to deliver water to customers that is pure, wholesome, healthful and potable and to ensure that its system will not be subject to backflow (Health & Saf. Code, § 116555, subd. (a)(2)-(3)). Backflow protection for PWSs with fire sprinkler systems is therefore necessary for the protection of public health.

What are the requirements in the CCCPH for PWSs serving water to users with fire sprinkler systems*?*

The CCCPH requires that PWSs address fire sprinkler backflow risks and provides PWSs with various means of compliance. The fire sprinkler requirements in the CCCPH apply to both new and existing fire sprinkler installations. (CCCPH, § 3.2.2(e).)

The CCCPH requires a minimum of DC for fire protection systems within 10 years of the effective date of the CCCPH, or July 1, 2034. (CCCPH, § 3.2.2(e).) This is the default requirement unless a PWS has residential service connections that meet specific criteria to not require a DC, a PWS has documented an alternative date for compliance, or the PWS has documented an alternative method of backflow protection in its Cross-Connection Control Plan (CCC Plan) (CCCPH, § 3.2.2(e)(2)).

In summary, PWSs that are subject to the CCCPH fire sprinkler requirements have five options for compliance with fire sprinkler backflow protection:

1. Meet the criteria in section 3.2.2(e)(3) of the CCCPH (residential only).
2. Require RP (minimum for high hazards) (CCCPH, § 3.2.2(e)(1)).
3. Require DC within 10 years (low hazard only) (CCCPH, § 3.2.2(e)).
4. Propose an alternative to DC protection via its CCC Plan (low hazard only) (CCCPH, § 3.2.2(e)(2)(B)).
5. Propose a compliance date extension via its CCC Plan (low hazard only)(CCCPH, § 3.2.2(e)(2)(A)).

A Note on CCC Plan Requirements

The CCC Plan is a living document and is expected to be updated as PWS information and conditions change. The CCC Plan may include a preliminary approach for addressing backflow protection on fire sprinkler systems that must be updated by the PWS as more information is available. (CCCPH, § 3.1.4(d).) When a PWS substantively updates its CCC Plan, the PWS must submit the revised CCC Plan to the State Water Board's Division of Drinking Water for review. (*CCCPH, § 3.1.4(d).)*

Recommendations for New Fire Sprinkler Installations

For new installations, the State Water Board recommends that the PWS coordinate with their local planning or building permit entities and the local fire authority to ensure new construction for residential is designed to meet the CCCPH's backflow protection requirements.

Recommendations for Existing Fire Sprinkler Installations

The State Water Board recognizes that fire sprinklers are critical safety features, and that retrofitting existing fire sprinkler installations for backflow protection may pose a challenge due to engineering constraints and costs of retrofit. Any modifications to fire sprinklers will likely require a hydraulic study and possibly necessitate costly modifications to install a backflow preventer.

One suggested approach is to consider risk management and prioritization. Generally, risk management involves assessing the likelihood of exposure to hazards (i.e. risk) and then abating, managing, monitoring, or accepting risk. Fire sprinklers that are considered a higher risk for backflow should be prioritized for evaluation. For low-risk fire sprinklers, a PWS can assess the nature of the risk and propose an alternative to DC protection or a compliance date extension. (CCCPH, § 3.2.2(e)(2).) To determine the level of risk, the first step is to complete a hazard assessment of the water user's premises and fire sprinkler system, which will provide the basis for any following actions.

To determine if a fire sprinkler system poses a high or low hazard and the appropriate backflow protection, the PWS must assess fire sprinkler systems to determine the degree of hazard. (CCCPH, § 3.2.2(e)(1).) How a PWS completes an assessment of a fire sprinkler system may vary based on the type of water user. Industrial or commercial user premises with fire sprinkler systems may require a more involved assessment than residential users with fire sprinkler systems. A customer can often provide relevant information to facilitate the fire sprinkler system hazard assessment. If the customer cannot provide the information, the PWS may conduct a visual inspection and/or review plans or building permits, construction year, and if unavailable, a best estimate by the PWS of any hazards present. The cross-connection control specialist will need to document if the fire sprinkler system is low or high hazard. A fire sprinkler system is

considered high hazard if it utilizes chemical addition (e.g., wetting agents, foam, anti-freeze, corrosion inhibitor, etc.) or an auxiliary water supply. (CCCPH, § 3.2.2(e)(1).) To determine if chemicals may be used in the fire sprinkler system, the PWS may need to consult with its local fire authorities.

Alternative proposals should consider the likelihood of backflow and water supply impairment, include a mechanism that reduces the likelihood of backflow and verification that the mechanism is operational, such as testing or inspection. For example, the AWWA Manual M14, Fifth Edition (2024) describes a possible alternative for an existing low hazard fire system equipped with a modern Underwriters' Laboratories (UL)-listed alarm check valve that contains no lead and is maintained in accordance with NFPA standard 25 (p. 93).

In addition, DDW recommends that the assessment of a fire sprinkler system should include the following considerations when proposing an alternative to DC backflow protection:

- What is the pipe material and hazard?
- What is the age of the fire protection system? Older installations may have components containing lead.
- Were installation standards followed when the fire sprinklers were installed?
- How severe is the risk of backflow? In the event of a distribution system backsiphonage event, is the backflow limited to a single connection or are multiple connections impacted?
- What is the building and fire protection system elevation relative to the PWS distribution system (i.e. are there significant pressure differentials)?
- Is the fire protection system already equipped with a backflow prevention device, such as a functioning single check valve?
- Does the PWS employ other potentially mitigating measures?
- What is the fire sprinkler system size? A larger fire sprinkler system probably contains a larger amount of water that can backflow.
- Maintenance and inspection frequency and history of the fire sprinklers.
- Any other factors that could impact the potential for the fire sprinkler system to backflow or degrade the water quality.

Any exemptions or alternatives to DC protection for residential fire sprinklers that are low hazard must be documented as part of the hazard assessment for the premises. (CCCPH, § 3.5.1(a).) Some fire systems may be found to be at higher risk of backflow and should be addressed as soon as possible. A PWS should not wait ten years to install necessary backflow prevention assemblies for fire sprinklers where a higher risk of backflow exists.

Conclusion

In complying with low hazard fire sprinkler system requirements outlined in the CCCPH, PWSs are required to comply with the default requirement of minimum DC protection unless (1) the PWS is subject to the statutory exemption under Health and Safety Code section 13114.7, (2) the criteria in section 3.2.2(e)(3) of the CCCPH are satisfied, or (3) the PWS has an alternative described in its CCC Plan. High hazard fire systems are required to have RP or AG backflow protection. A PWS that believes it has a fire sprinkler system that is statutorily exempt should reach out to their local fire authorities and notify the State Water Board of this determination. Any substantive changes to a PWS fire sprinkler system backflow protection must be reflected in its CCC Plan and submitted to DDW for review. PWSs should develop and maintain an inventory of fire sprinkler systems within its service area, as well as the degree of hazard associated with each fire system and any exemption or alternative applied to the fire system.

Industry guidance noted in references below provides additional information on assessing fire sprinklers.

References and Further Reading

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