

Water Supply Division

<b>Title:</b>	Fire Hydrants on PWS with insufficient storage capacity and/or undersized lines
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*Problem:* Fire Hydrants that are on a Public Water System (PWS) distribution system that has 1) insufficient storage capacity and/or 2) undersized distribution lines, and/or 3) pose a public health risk from Appendix A Requirements.

*Solutions:* Short term solutions for each situation can be identical; the first thing that the Water System must do is submit a written notice to the local fire department clearly establishing that the fire hydrant shall NOT be directly connected to a pump of any type (including fire trucks) because the distribution system is not designed for fire-fighting. The notice must be signed by the water system owner(s) or the designated Administrative Contact. A copy of the notice must be submitted to the Water Supply Division (the Division) with the original being placed in the Water System’s Operation & Maintenance Manual.

Additional short-term solutions subsequent to the written agreement include: color-coding the hydrants to further help distinguish them from fire-fighting hydrants (the color-coding shall comply with AWWA and/or ISO standards, which necessarily implies ISO testing shall be completed to adequately assign maximum flow-rates); “bagging” the hydrants as being out-of-service; and/or permanently welding the steamer nozzle closed so that a pumper truck may not directly connect to the hydrant. This may not be an all-inclusive list of potential short-term solutions; additional options may be available at the request of the PWS and should be directed to the Division for review and possible approval.

***Long-term solutions must be preceded by a written improvements plan/description that clearly identifies the activities that are to be completed as well as a timeline and cost analysis for these improvements to occur.***<sup>(1)</sup> Long-term solutions are more prescriptive for each problem situation, but clearly fall under one of several simple categories: remove, replace or upgrade/modify the Water System.

The first option is to simply **remove** the fire hydrant from the distribution system. Although straight-forward, the Water System must provide a hydraulic analysis of the distribution system and ensure that the removal of the hydrant will not adversely affect water system maintenance (i.e. loss of a flushing point may negatively affect water quality in the distribution system).

If system maintenance demands it, **replacement** of the standard fire hydrants with flushing hydrants that do not have a 4” connection (e.g. a 2” blow-off hydrant) may maintain water quality in the distribution system while still achieving compliance with the Water Supply Rule (WSR).

**Upgrade or modification** of the Water System is dependent upon the exact situation that is prohibiting the PWS from meeting the requirements of the WSR, with the most common being lack of sufficient storage and undersized water mains.

Situation #1 (insufficient storage capacity): the Water System may build additional storage (enough to provide 500 gpm of fire flow for 2 hours - 60,000 gallons) while still maintaining sufficient pressure (20 psi) at all locations within the distribution system, and quantity (Average Day Demand (ADD)), to the remainder of the system. The second modification to the storage/distribution system to address situation #1, is to connect the fire hydrants to the undersized storage tank via a separate line(s) that enters the tank at an elevation that will make depletion of the storage tank to a volume less than the ADD impossible, or otherwise permitted by the division. In other words, the pipe(s) that provide water to the fire hydrants will exit the storage tank at an elevation that is higher than the domestic supply distribution lines, thereby assuring that all water in the storage tank that is lower than the fire suppression pipes will be available only to normal distribution system flow.

Situation #2 (undersized lines): the Water System may again choose to remove/replace the hydrants or they may undertake a line replacement program that will be designed to replace all undersized lines in the distribution system to achieve compliance with the WSR. The main lines that have fire hydrants must be replaced with lines that are at least 8-inches in diameter, or hydraulically demonstrate through hydrant flow testing that they meet the technical standards in Appendix A of the WSR. The Water System may be able to demonstrate that some smaller lines (e.g. 6-inch) are capable of producing adequate fire-fighting flows (500 gpm for 2 hours while maintaining adequate pressure at all other points in the distribution system) in their particular system. In this situation, the hydrants would need to be ISO-tested annually (as is typically required from a fire-fighting perspective anyway) to ensure that no degradation in flow has occurred from changes in distribution system hydraulics. Additionally, any system that is able to demonstrate adequate flow in smaller than required lines must submit all documentation necessary to obtain an exemption from the WSR technical standards.

- (1) In instances where a long-term solution and written improvements plan/description has not been approved by the Division, the fire hydrants located on the system not meeting WSR construction and Design Standards must be removed from the distribution system.



Approved by: \_\_\_\_\_

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Revision/Review Date	Reason for Revision

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