



Arkansas Department of Health

Engineering Section

DESIGN AND OPERATIONS POLICY CONCERNING FLUORIDE FEED SYSTEMS July 2012

This policy designates general requirements for the design and operation of fluoride feed facilities for public water systems:

- The fluoride feeder systems must be properly designed, sized and installed, including appropriate cross-connection as well as primary and secondary overfeed protection. Redundant fluoride feeders are not required.
- Two diaphragm-type, antisiphon devices must be installed in the fluoride feed line when a metering pump is used, one on the discharge side of the pump and one near the injection point. If a peristaltic pump is used, an antisiphon device is required only on the discharge side of the pump.
- The fluoride chemical should be fed into the main flow of the water being treated to ensure proper mixing and reduce the potential of corrosion. For fluoride feed into pipes, the injection nozzle shall be at a 45° angle on the bottom half of the pipe and extend 1/3 of the pipe diameter into the receiving pipe. See Figure 4-4 in 'Water Fluoridation – A Manual for Water Plant Operators', Centers for Disease Control.
- All fluoride chemicals must conform to the appropriate American Water Works Association (AWWA) standards and be certified as being in compliance with ANSI/NSF Standard 60.
- All fluoride feed systems must have a means of measuring the amount of chemical being fed and a means of measuring the amount of water being treated.
- No more than a 7-day supply of hydrofluorosilicic acid should be connected to the feed pump. All bulk storage tanks with more than a 7-day supply must have a day tank, which usually contains a 1 to 2 day supply of acid.
- Fluoridation chemicals should be separated from other water treatment chemicals. This does not necessarily require a separate building. Adequate containment and/or separation should be provided to effectively prevent contamination and chemical interactions.
- Dust control provisions must be provided for systems transferring dry fluoride chemicals from shipping containers to storage bins or feed hoppers.

- Bulk storage tanks for hydrofluorosilicic acid must be provided with secondary containment. Secondary containment is recommended for day tanks and appurtenances.
- Hydrofluorosilicic acid systems using bulk tanks should utilize a manually controlled transfer pump for the day tank with the pipe connections located at or near the top of the tanks to reduce the potential for significant chemical overfeeds, overflows and spills.
- The fluoride feed system must be installed so that it cannot operate unless water is being pumped. The metering pump or dry feeder must be wired in series with the main well pump or a high service pump via a non-standard electrical outlet and receptacle. Controlling the fluoride feed via flow pacing with the plant flow may be allowed but controlling via an in-line analyzer is not.
- Appropriate personal protective gear shall be provided. This varies depending upon the fluoridation chemical used. Emergency shower and eyewash devices shall be provided for hydrofluorosilicic acid systems, if not already provided for existing chemicals.
- The water system must have an analyzer to monitor (by grab samples) each fluoridation point at least 5 times a week per Standard Method 4500-FI⁻ B, C, or D. Monthly split samples must be taken for each fluoridation point and submitted to the ADH laboratory for analysis.
- In-line fluoride analyzers are allowed, but not required. If used, daily grab samples are still required and must be analyzed using a bench top instrument for official reporting.
- Antisiphon devices must be dismantled and inspected annually and tested semi-annually to ensure they are functioning properly. All other components of the fluoride feed system must be inspected annually.
- Public notice shall be provided to water customers prior to the start-up of the fluoride feed system.
- Please refer to 'Ten States Standards — Recommended Standards for Water Works' by Health Research Inc., the 'Engineering and Administrative Recommendations for Water Fluoridation' and the 'Water Fluoridation – A Manual for Water Plant Operators' by the Centers for Disease Control and Prevention for more detailed information on the design and operational requirements for fluoride feed systems.