Freese and Nichols understands water distribution systems and how to respond to water quality challenges such as low chlorine residuals, high water age, high disinfection by-product levels, nitrification and source water chemistry. When challenges arise, we can provide a number of solutions to improve water quality.

We have comprehensive experience in distribution system water quality. Our team of professionals, specializing in water system planning, design, and treatment, can customize an approach for your unique system. From achieving regulatory compliance to proactive system maintenance, FNI works with clients to understand their goals and meet expectations for long-term system results.

How FNI Can Help You

FNI can determine the best action plan for maintaining and optimizing your distribution system’s water quality. We provide:

- Water quality modeling
- Unidirectional flushing (UDF) programs
- Regulatory assistance
- Water quality capital improvements planning
Project Highlight: Water Quality Action Plan, Town of Addison

Background

- Distribution system serving 15,000 residents and significant commercial development
- Average day demand of approximately 6 MGD
- Wholesale customer of Dallas Water Utilities with two delivery points in the southern portion of town
- History of isolated areas with low chlorine residuals

Project Highlights

- Reviewed historical water quality data
- Developed recommended enhanced water quality sampling plan
- Investigated several alternatives to improve water quality, including operational modifications, tank mixing systems, booster chlorination, pipeline replacement program and UDF
- Provided operational and capital recommendations in a Water Quality Capital Improvement Plan with cost estimates and project phasing
- Summarized results in a Water Quality Action Plan Report

SERVICES

WATER QUALITY MODELING

Distribution system water quality modeling can be used as a tool to evaluate water age, supply sources and constituent concentrations. FNI’s modeling services include:

- **Operational modifications**, such as tank deep cycling, pump on and off controls, pressure plane transfers, and flushing times, to determine the impact on water age
- **Source trace modeling** to determine how water travels through the distribution system and to identify mixing zones of multiple supply sources
- **Constituent modeling** to evaluate chlorine residual and other water quality parameters

UNIDIRECTIONAL FLUSHING (UDF) PROGRAMS

A UDF program consists of proactively displacing poor quality water with high quality water through a scouring and cleaning process to remove sediments and biofilms within the distribution system. FNI’s approach includes:

- Utilizing a hydraulic model
- Creating flush groups and sequences
- Providing detailed map books for field crews

REGULATORY ASSISTANCE

FNI can coordinate with the Texas Commission on Environmental Quality, assist with reporting requirements, or provide public education, in addition to recommending strategies for maintaining compliance. Regulations include:

- Stage 2 Disinfectants and Disinfection Byproducts Rule
- Groundwater Rule
- Total Coliform Rule

WATER QUALITY CAPITAL IMPROVEMENTS PLANNING

FNI can assist with development of a Water Quality Capital Improvements Plan to identify and prioritize projects to help improve distribution system water quality. Improvements include:

- Tank mixing systems
- Booster chlorination equipment
- Water main replacement/ rehabilitation
- Remote chemical analyzers
- SCADA improvements
- Automated flushers
- Transfer valves

Freese and Nichols has provided innovative engineering solutions for Texas since 1894, when founder John Hawley became one of the state’s first independent water and sewer engineers. We are a multi-discipline engineering, architecture, environmental science, construction services and master planning firm with offices across Texas to better serve our clients.