CASE STUDY

LONGBOAT KEY

Automated Disinfectant Residual Control Technology Saves Millions of Gallons of Water While Maintaining Consistent Chloramine Residual Levels in Longboat Key, Florida

OVERVIEW

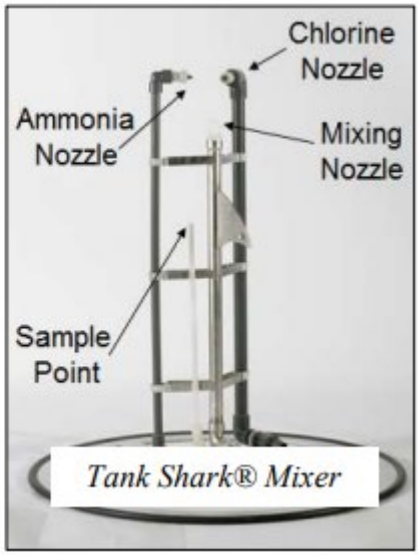
Located along the central west coast of Florida, the beautiful town of Longboat Key occupies a barrier island with over 7,000 residents. As is common with a number of Florida's barrier island communities, water supply is from the mainland. In this case, Longboat Key receives chloraminated potable water from their water wholesaler.

The chloraminated water helps prevent pathogen growth and has generally good longevity in systems. However, a number of issues can create difficulties in maintaining an effective concentration of monochloramine. Warm temperatures, climate seasonality, distance travelled by the water and many dead-ends (increased water age) can exacerbate the degradation of disinfectant levels in the water Longboat Key receives from the water wholesaler. In general, warmer temperatures encourage the disassociation of the monochlormaine molecule resulting in the release of ammonia. Ammonia can become food source for various types of nitrifying bacteria – further accelerating water quality decay.

With only one full-time operator covering water treatment and aiding water distribution and sewer collections as needed, maintaining disinfectant residual levels became a desperate game of "whack-a-mole" as a cycle of testing followed by manual dosing with sodium hypochlorite became the norm during periods of potential nitrification (nitrite and nitrate accumulation). Often having to make corrections in the middle of the night and rely on high volume flushing (up to tens of millions of gallons per year), Rich Walters, Water Treatment Operator, felt that there had to be a better way.

Water Quality Station

Smart Controller PLC



Tank Shark® Mixer

Initially, the utility installed two Tank Shark® eductor style mixers to effectively reduce water age in the two water storage tanks. When it became clear that water quality could not actually be controlled to the level desired, Longboat Key started to examine an automated disinfectant residual boosting solution. In 2021, the town installed two Monoclor® RCS (Residual Control Systems) for the Mid-Key and South Key tanks. The systems consisted of the two original Tank Shark® mixers, Water Quality Stations (measure chloramine, ORP, pH and temperature in realtime), Smart Controllers (house the PLCs that determine the automated real-time dosing solutions), chlorine feed skids for bulk hypochlorite and ammonia feed skids for feeding liquid ammonium sulfate (existing equipment). Once the equipment was installed, integrated with existing equipment and calibrated, a desired residual set-point was programmed into the system. Then the Monoclor® RCS systems continually monitored the existing chloramine residual in the tanks and automatically adjusted the dosing rate to maintain the desired residual set point with daily sample confirmation of water quality. The result has been dramatically more stable residual levels and improved water quality. The data below for April 2021 depicts the stable disinfectant residual maintained in the two tanks between the operator selected upper and lower control limits:

"We now have control over our water quality which was very time consuming and difficult to do manually. I was spending a majority of the week managing the nitrification issues (with some overtime) and now it is automatically controlled and we're saving water due to a lot less flushing."

- Rich Walters - Water Operations Superintendent

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