

# BRADENTON

Automated Disinfectant Residual Control System Produces Consistent Residual Levels in Bradenton, Florida Distribution System

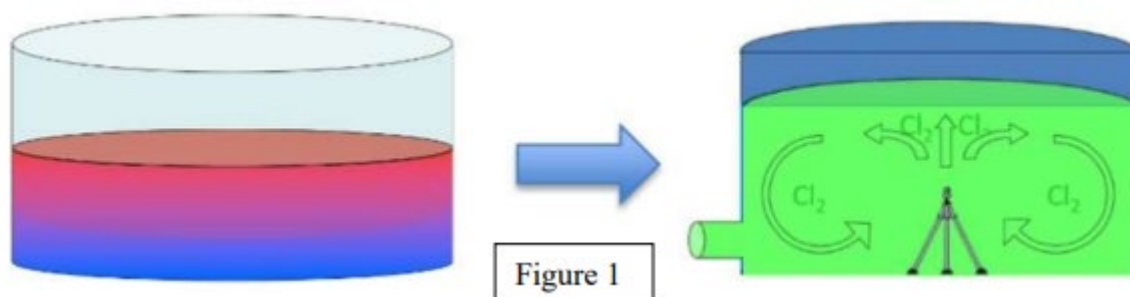


## OVERVIEW

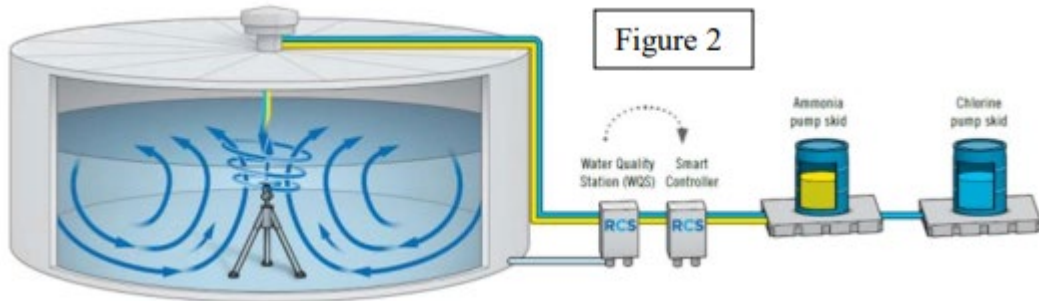
The City of Bradenton is located on the west coast of central Florida and like many Sunbelt cities, it has had to manage extraordinary growth while always striving to improve water quality to its 15,000 customers. With the City's primary source of water being the Bill Evers reservoir, the City's choice of secondary disinfectant is monochloramine which helps minimize the generation of disinfection byproducts. However, Bradenton's warm climate and extensive water distribution and storage system which includes five potable water storage tanks can create water quality management headaches for staff.

While monochloramines are a proven strategy for limiting disinfection byproduct issues, the natural degradation of monochloramine – especially in warm climates – allows for the presence of free-ammonia which can become a food source for various types of nitrifying bacteria. To combat these bacteria and any other potential pathogens, the City would employ a program of tank dumps and flushing to keep "fresh" disinfectant levels in the distribution systems. As with many water utilities who utilize these programs, the constant monitoring, water wastage and unplanned operator callouts to adjust disinfectant levels can become costly for the utility.

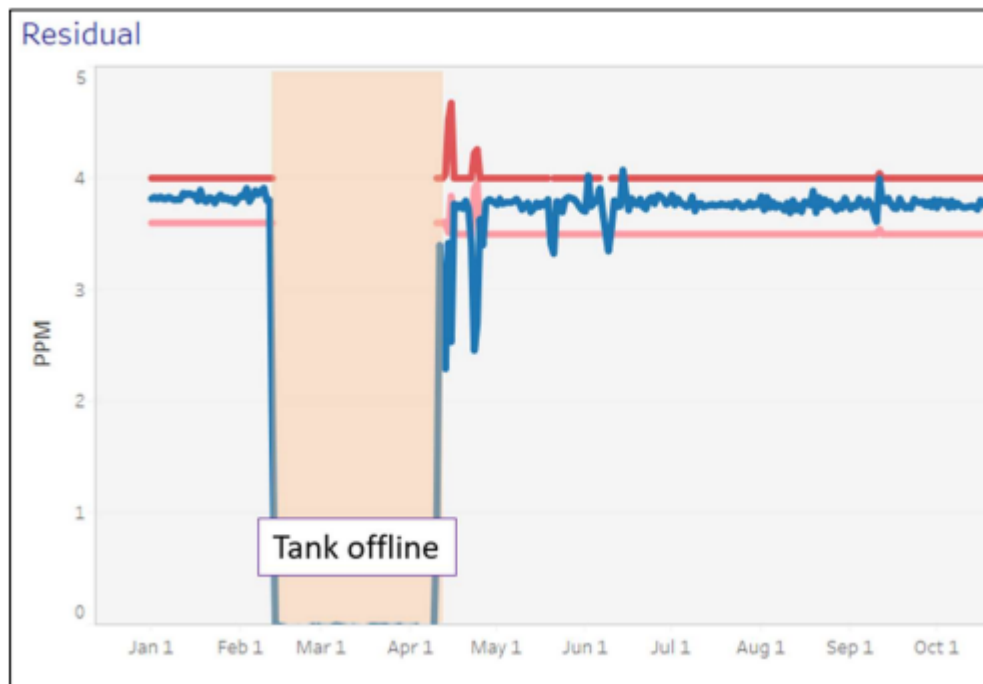
In 2012, the City became an early adopter of tank mixing technology by installing water tank mixers in each of the five water storage tanks. Water tanks can become areas of water quality degradation as the system detention time allows the water in the tanks to form layers or strata of common temperature and disinfectant concentrations. Layers with very high temperature and low chloramine concentration can allow for pathogen growth that initiate a cycle of water quality destruction. The PAX tank mixers that were installed are engineered to destratify the water in the tanks and allow for the incoming more highly chloraminated water to mix with the bulk volume of the tank (Figure 1).



Despite the improvement in water quality management through addition of the PAX mixers, the City staff continued to explore technologies that could give them the next level of improvement in disinfectant residual control. In 2017, staff became aware of the Monoclor® Residual Control System (RCS, Figure 2) designed to fully mix tanks, determine real-time residual levels, and dose the appropriate ratio of ammonia and chlorine (constituents of monochloramine) based upon the tank's actual complex chloramine residual chemistry. The Monoclor® RCS systems were installed in 2018 and 2020 on two 0.5 million-gallon tanks (Tank 6 and the West Tank) with upgraded PAX mixers to provide additional mixing energy that would facilitate the addition of both chlorine and ammonia to form new monochloramine. Operators were then able to dial-in the desired residual setpoint for those tanks and let the systems automatically calculate and dose the tanks to maintain the chosen residual levels.



As shown in Figure 3 below, once the tank and system are brought on-line, the RCS system automatically holds the disinfectant residual level between the upper and lower control limit.



**Tank 6 2019**  
**Figure 3**

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