

## Case Study

# C.B. Collier, Jr. Water Treatment Plant



### Client

Gadsden Water & Sewer

### Project

24 MGD MIEX® DS System

### Location and Date

Gadsden, AL August, 2013

### Engineers

Goodwyn | Mills | Cawood



Figure 1: The MIEX® System at Gadsden, Alabama

"The MIEX® Process provides us peace of mind. You can't put a value on that."

Mr. Mike Lankford  
Superintendent of Environmental Services - Gadsden Water and Sewer Board (GWWSB)

### Challenge

When the Alabama Department of Environmental Management (ADEM) announced the protocols for compliance with the EPA Stage 2 Disinfection By-Product Rule, they also announced targets to assist systems in optimizing their plants and short and long terms goals for the distribution system.

GWWSB had no doubt that their system would comply with the short term goal; however, it was equally clear that the nine consecutive systems which purchased water would not be able to comply. In addition, GWWSB knew they were unable to meet both the Long Term Goal and the Plant Effluent Targets with their current treatment methods.

### Solution

GWWSB invested in specific lab equipment to allow close monitoring of TOC levels and began the arduous task of experimenting with possible methods to remove the highly reactive TOC. Mike Lankford, Superintendent of Environmental Services, states, "We tried every coagulant there was to remove more TOC but nothing worked any better than what we were using." As suggested by ADEM, the plant began applying a heavy dose of potassium permanganate at the intake with marginal, if any, improvement. In addition, a pilot test of enhanced treatment followed by micro filtration was carried out; however, a substantial portion of the TOC remained in the dissolved state and continued to pass through the microfilters.

While trials were going on at the WTP, the City distribution system was frequently flushed to keep the treated water moving. Consecutive systems were also conducting excessive flushing programs with minimal impact on reducing DBP concentrations, all the while wasting valuable water.





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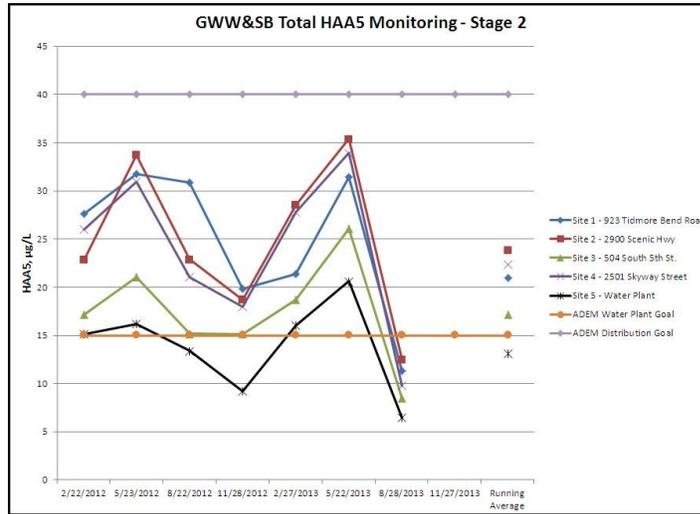


Figure 2: Results of the dramatic reduction in HAA5s during the first quarter of MIEX® operation

“Having heard that ion exchange is effective at removing DOC, we decided to test it in our lab using raw water,” states Lankford. “MIEX® resin was selected due to its ability to be utilized as a pretreatment process. We did not want something that would be post treatment. This is a significant issue for our plant and we want the flexibility of having multiple tools to treat for TOC as well as the additional time that pretreatment affords.”

The plant tested the MIEX® resin 3 times per week for more than a year before deciding to run a small scale pilot. The results from the pilot eventually led to the installation of a 24 MGD Dual Stage MIEX® System. The C.B. Collier, Jr. Water Treatment Plant is the largest MIEX® system in North America. “And we are quite proud of that,” states Lankford.

### Project Outcome

MIEX® pre-treatment alone results in 55% TOC removal. With coagulation the plant achieves a 65% removal rate. GWWSB now meets all of ADEM’s plant effluent targets as seen in these distribution system graphs.

Furthermore, the highest site LRAA (recorded from a consecutive system) is 26 µg/L for TTHM and 12 µg/L for HAA5s putting GWWSB, at less than half the value of ADEM’s Long Term Goal.

Besides removing TOC and lowering DBP’S, additional benefits have been realized, such as:

- Eight different chlorine booster stations have been turned off
- Improved treatment
  - o Coagulant dose reduced by 50%
  - o Less sludge in the basins
  - o Water is easier to coagulate
- A steady and consistent chlorine residual in the distribution system
- Minimal distribution system flushing
- Consistency in the concentration of DBPs in the distribution system – no outliers.
- Improved water quality for our wholesale customers

“The treatment results from the MIEX system have exceeded our expectations, and have given our organization the unquestioned ability to provide excellent water quality to our retail and wholesale customers now and in the future,” stated GWWS&SB General Manager Frank Eskridge. “I give it the highest praise that can be given to a treatment process – IT WORKS” he added.

