

CASE STUDY: Monroe, North Carolina PAC Contactor Upgrade

Application:	Powdered Activated Carbon (PAC) Contactor
Design Flow (ADF):	11 MGD
Mixing Efficiency:	0.16 HP/1000 ft ³
Compressors:	Two (2) 7.5 HP Scroll Compressors
Nozzles:	24
Installers:	City of Monroe, NC

AquaBlend Potable Water Mixing System Selected for WTP Upgrade

The City of Monroe John Glenn Water Treatment Plant (WTP) has a capacity of 11 million gallons per day and provides drinking water to over 25,000 customers. The WTP draws its raw water from nearby Lake Twitty. As is often the case, this raw water occasionally contains compounds that produce unpleasant taste and odor in the drinking water.

Powdered activated carbon (PAC) is widely used in the treatment of drinking water to remove and control undesirable taste and odor compounds. The city formerly added PAC to the raw water intake upstream of the flocculation basins, but the contact time was too brief for the taste and odor compounds to adsorb to the PAC. The plant already had a PAC contactor basin, but it had been out of service for some time. In 2020, the City upgraded the WTP to address this issue.

EnviroMix's AquaBlend Potable Water Mixing System was evaluated versus mechanical mixing technology.

AquaBlend required only one-third the O&M expenditure of the alternative mechanical mixing system, offering the city savings of greater than 60%.



AquaBlend provides efficient and effective mixing in the PAC contactor



ENERGY EFFICIENCY

< 40% of the energy consumption of mechanical mixing



STRAIGHTFORWARD OPERATION

Duty and standby compressor deliver mixing air versus eight mechanical mixers



PROCESS OPTIMIZATION

Variable mixing intensity capable of producing the optimal mixing regime at the minimum energy input



UNPARALLELED FLEXIBILITY

Firing parameters of duration and frequency are operator adjustable



The Zombie valve control module optimally controls mixing regime through operator adjustable settings for duration and frequency of nozzle firing



The serpentine flow pattern of the PAC contactor would have required eight mechanical mixers versus two scroll compressors (one duty, one standby)

With one-third the O&M costs of the mechanical mixing systems, AquaBlend creates savings of greater than 60%.

To maximize the removal of the taste and odor causing compounds, various mixing technologies were evaluated to ensure the PAC was well-mixed and did not settle out and deposit in the contactor. EnviroMix's AquaBlend Potable Water Mixing System was evaluated versus traditional vertical entry and submersible mechanical mixing technology.

The serpentine, baffled flow pattern within Monroe's PAC contactor would have required eight mechanical mixers, resulting in substantially higher operations and maintenance costs and requiring significant modifications to the WTP's existing structure.

AquaBlend was selected to provide mixing of PAC with the raw surface water in a PAC contactor based on:

- Custom-designed, **maintenance-free, in-basin nozzle header system**
- Straightforward Zombie valve module controller
- Scroll compressors, eliminating oil lubrication in the air compression chamber
- Proven **uniform, bottom-up mixing using high-pressure air** that is 100% oil free
- **Savings of greater than 60%** versus mechanical mixing alternatives

EnviroMix worked directly with the City to design the AquaBlend system for the PAC contactor. Utilizing their own staff, the City was able to install the system and construct the necessary support components, demonstrating the straightforward implementation of AquaBlend.



Contact sales@enviro-mix.com today to discuss the ways EnviroMix can optimize your mixing solutions.