CASE STUDY:

Butner, North Carolina
SGWASA Wastewater Treatment Plant

ENVIROMIX

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Application:	Anaerobic, Anoxic, Aerobic, Post Anoxic
Design Flow (ADF):	5.5 MGD
Process Configuration:	5-Stage Bardenpho
Compressors:	Two (2) Atlas Copco GA37+ 50 HP
Nozzles:	284
Design Engineer:	CDM Smith

BioMix replaced the jet-mixing system in the anaerobic and anoxic selectors.

EnviroMix Provides 75% Energy Savings and Stable Biological Phosphorus Removal

The South Granville Water and Sewer Authority (SGWASA) serves several towns in Granville County, North Carolina, including Butner. SGWASA's mission is to provide quality services to customers in a sustainable and environmentally conscious manner.

The SGWASA WWTP was upgraded in 2015 to replace infrastructure that had reached the end of its design life and enable the facility to meet more stringent nitrogen and phosphorus effluent limits. As part of the upgrade, SGWASA replaced the plant's existing jet mixing pumps and headers in the anaerobic and anoxic selectors and converted their oxidation ditch to include post anoxic and reaeration zones as part of a 5-stage Bardenpho nutrient removal process.

EnviroMix's BioMix Compressed Gas Mixing was selected to replace the jet mixing system in the anaerobic and anoxic selectors, providing an estimated 75% energy savings versus jet mixing pumps. BioMix was also easily integrated with fine bubble aeration in the aerobic process, delivering significant energy savings by utilizing two compressors as opposed to more than a dozen mixers. Since the upgrade, the facility has not exceeded any permitted effluent quality limits.

ENERGY EFFICIENCY

75% energy savings with BioMix vs. jet mixing pumps

Additional savings when operating as BioMix-DC

STRAIGHTFORWARD OPERATION

No mechanical or electrical components in the wastewater

Compressor supplies all air needed for many applications

PROCESS OPTIMIZATION

Proven optimized mixed conditions

Maximized VFA production and utilization by PAOs with BioMix-DC

UNPARALLELED FLEXIBILITY

Suitable for a wide variety of applications

Easy upgrade to BioMix-DC

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Local valve modules control nozzle firing.

BioMix-DC's long, deep anaerobic fermentation cycle maximizes VFA formation.

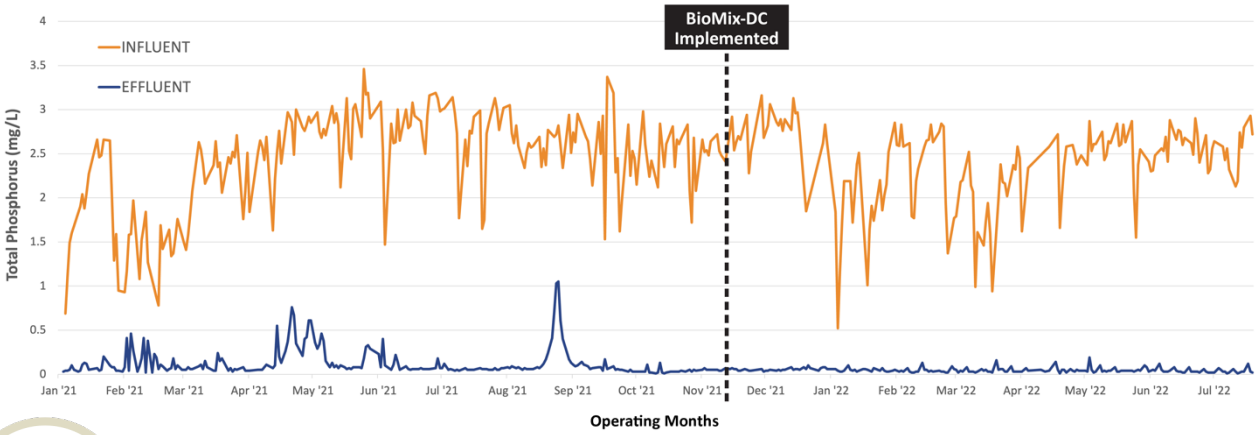
> *"EnviroMix's very good customer service means a lot. We like the whole EnviroMix system, and obviously we've gotten positive results from it."*
>
> *Cody Norwood,*
> *SGWASA Plant Superintendent*

Upon hearing of the early success of BioMix-DC Enhanced Anaerobic Mixing in 2021, the SGWASA plant was eager to upgrade their mixing system in hopes of achieving more stable enhanced biological phosphorus removal (EBPR).

BioMix-DC optimizes EBPR by transforming a traditional anaerobic selector into an intensified fermentation tank by alternating a short mixing cycle with a long deep cycle. The deep cycle increases anaerobic solids retention time (SRT) while creating a fermentation blanket to generate volatile fatty acids (VFA). The presence of additional VFA leads to the proliferation of phosphorus accumulating organisms (PAOs), the microorganisms responsible for EBPR.

After implementing BioMix-DC, testing showed high levels of orthophosphate release in the anaerobic zone — more than three times the influent concentration. The sampling and testing confirmed efficient and effective EBPR. Samples collected in the fermentation blanket also confirmed elevated readily biodegradable COD, which indicates that conditions have been created for PAO growth and optimized EBPR.

The data below shows the plant continues to maintain stable effluent phosphorus levels below their permit limit. As a repeat customer, the SGWASA plant superintendent said, "EnviroMix's very good customer service means a lot. We like the whole EnviroMix system, and obviously we've gotten positive results from it."



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