

CASE STUDY: Manatee County, Florida North Regional WRF



Application:	Influent Flow Equalization
Design Flow (ADF):	7.5 MGD
Mixing Efficiency:	≈ 0.07 HP/1000 FT ³
Compressors:	Two (2) 30 HP Rotary Screw
Nozzles:	240
Design Engineer:	Kimley-Horn & Associates, Inc.



Short duration bursts of compressed air mix an area of the tank 2–3 times per minute.

BioMix™ System Achieves 90% O&M Savings for Florida WRF

Manatee County operates three regional wastewater treatment plants that offer reclaimed water for irrigation to farms, golf courses, and private residences in the region.

In 2017, the county upgraded the North Regional Water Reclamation Facility (NRWRF) located in Palmetto, Florida. Treatment was improved through the construction of three 1-million-gallon influent flow equalization tanks utilizing a BioMix Compressed Gas Mixing System.

In the equalization tank system, return activated sludge is introduced to provide odor control and to facilitate anaerobic selector operation, thereby enhancing biological phosphorus removal. The BioMix system provides efficient mixing without the introduction of measurable oxygen, ensuring optimal anaerobic conditions for biological nutrient removal (BNR). Equalization of flow and loading to the treatment process ensures consistent and efficient nutrient removal, and it guarantees the supply of reclaimed water for reuse.

Manatee County selected BioMix based on its lowest total cost of ownership versus mechanical and diffused air mixing technologies. **Use of the BioMix system in lieu of conventional diffused air mixing has resulted in annual energy cost savings of over \$150,000 for the NRWRF.**



ENERGY EFFICIENCY

Mixing efficiency of 0.07 Hp/1000 FT³

\$150,000 annual energy cost savings versus diffused air mixing



STRAIGHTFORWARD OPERATION

No in-tank moving parts

One duty and one standby compressor serve all three equalization tanks



PROCESS OPTIMIZATION

Efficient mixing without the introduction of measurable oxygen ensures optimal conditions for BNR



UNPARALLELED FLEXIBILITY

Variable mixing intensity based on operating depth

No low-level limitations – ability to mix at any liquid depth



Local control panels distribute the optimal mixing energy.



Compressors under a canopy meet the process mixing air demands of the BioMix system for all three equalization tanks.

The BioMix system enables the NRWRF to realize a **90% reduction in O&M costs** versus conventional diffused air mixing.

With any treatment process, consistency of flow and loading provide the optimal conditions for treatment efficiency. Through the implementation of the flow equalization tanks and BioMix compressed gas mixing system, NRWRF is able to process wastewater more efficiently and at a higher quality.

Offering the lowest total cost of ownership, BioMix Compressed Gas Mixing was selected to provide high efficiency mixing for the equalization tanks. The system also eases the maintenance burden for the facility and offers unparalleled flexibility.

- One duty and one standby 30 HP compressor provide the mixing energy for all three equalization tanks. A traditional diffused aeration mixing system would require ten times the horsepower to provide equivalent mixing.
- A local control panel at each tank controls the mixing air from the compressor system and distributes it uniformly to each tank as necessary.
- Optimal mixing energy for each tank is automatically adjusted for the range of depth operation, ranging from a few feet of liquid depth to a maximum of 23 feet.

Thanks to the efficiency of the BioMix system, the facility's O&M costs will be reduced by 90% versus conventional diffused air mixing. BioMix will save Manatee County millions of dollars over the life the system.



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