

BioMix™ Success Story — 60%+ Energy Reduction

F. Wayne Hill WRC, 60 MGD, Gwinnett County GA

Project Details

- BioMix™ system provides *60%+ power savings* versus leading submersible mixer
- Compressed air mixing system fires short bursts of gas through engineered nozzles affixed to tank floor
- Eliminates costly maintenance associated with mechanical mixers
- Maximum efficiency through multiple basin application
- No mechanical or electrical components in the wastewater



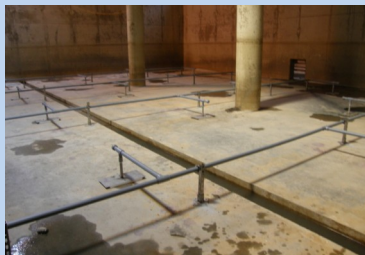
Continued operation of a BioMix™ installation at the 60 MGD F. Wayne Hill Water Resources Center (WRC) in Gwinnett County, Georgia, provides comparable mixing to a submersible mechanical mixer, but uses significantly less power and requires less maintenance.

In 2009, BioMix was installed in multiple biological treatment cells within Train 10 of the facility's modified Bardenpho process. The innovative BioMix system provides mixing in liquids by firing short bursts of compressed air through engineered nozzles affixed to the floor of the tank. Standard firing parameters of 0.5 second duration at 4.0 to 5.0 second intervals provide proven, effective mixing. Virtually all power consumption is limited to the compressed air source (which may be used across multiple process tanks).

Within anaerobic selector Cell A1 (41'6" x 55' x 24' deep), BioMix was compared directly against the previously-installed 15 HP submersible mixer with controls. The BioMix system consisted of an Ingersoll Rand 15 HP rotary-screw compressor, thirty floor-mounted nozzles, piping, and controls. Within Cell A1, mixing results were comparable; however, the BioMix system used *46% less power*.

Power readings were also observed when mixing three Train 10 process cells. Each tank had similar BioMix configurations but utilized the same 15 HP compressor. As a result, the system showed *even greater power reduction (60%+)* when compared to three submersible mixers. See the following table:

	Submersible Mixer (x3)	BioMix
Amps	66.15	15.14
Volts	472.2	483.0
Power Factor	0.56	0.93
Horsepower	40.62	15.79
HP/1000 ft ³	0.247	0.097
Kilowatts	30.30	11.78
\$/Yr @ \$0.06/kW-Hr	\$15,926	\$6,192
\$/Yr @ \$0.09/kW-Hr	\$23,889	\$9,287
\$/Yr @ \$0.12/kW-Hr	\$31,851	\$12,383



BioMix tank installation at F. Wayne Hill WRC

Facility Summary

- Treatment process includes ten parallel trains of modified Bardenpho process, each with anaerobic, anoxic, and oxic cells with recycles for biological nutrient removal
- Discharges to Lake Lanier, the primary drinking water reservoir for Metro Atlanta

Demonstrated Results

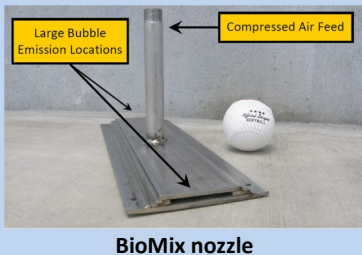
BioMix systems provides significant power savings as compared to mechanical mixer installations. Mechanical mixers, which are typically sized by volume (HP/1000 ft³), require at least one unit per basin, and the total installed power is commonly increased to accommodate standard motor sizes. However, BioMix system power utilization is efficiently applied across multiple tank systems, by using a single, optimally-sized and easily-maintained compressor.

BioMix™ Success Story — Anaerobic Selector Mixing

F. Wayne Hill WRC, 60 MGD, Gwinnett County GA

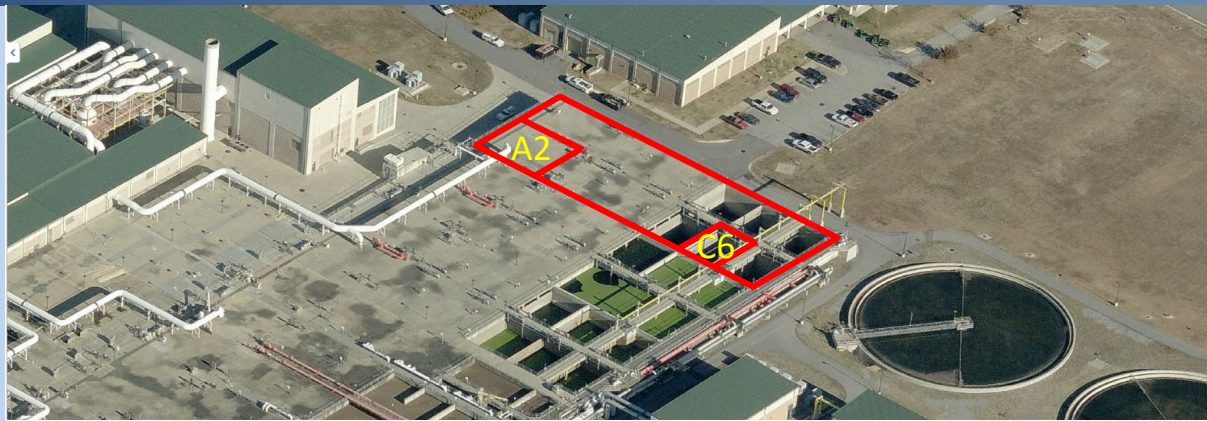
Project Details

- Modified Bardenpho anaerobic selector reactor mixing
- BioMix system fires short bursts of compressed air through engineered nozzles affixed to tank floor
- Gas volumes (or “large bubbles”) transfer insignificant amount of oxygen into wastewater
- Similar orthophosphate release at fraction of installed power



About EnviroMix

Headquartered in Charleston, SC, EnviroMix is a privately held corporation, which designs and manufactures treatment systems to reduce energy and maintenance costs while helping facilities meet nutrient removal limits. Utilizing patented and proprietary technology, the Company provides both equipment and process control solutions to enhance plant performance in the water and wastewater markets. For additional information please visit www.enviro-mix.com.



Continued operation of a BioMix installation at the F. Wayne Hill WRC in Gwinnett County, Georgia, provides energy-efficient anaerobic selector reactor mixing with effective orthophosphate release and subsequent uptake.

In 2009, BioMix was installed in multiple biological treatment cells of the facility’s modified Bardenpho process. BioMix, installed in anaerobic selector Cell A2 in Train 10, was compared directly against the respective biological phosphorus removal performance in parallel Trains 5 and 7, both with submersible mixers. Within each train, Cell A2 is the second of two anaerobic selector cells, and Cell C6 is the final oxic cell of aerobic treatment.

Demonstrated Results

The variance in data collected between trains for the respective process tanks is insignificant. Orthophosphate release rates are similar utilizing either mixing technology, as are the luxury uptake rates within the aerobic sections at the end of the biological treatment processes. This data verifies the ORP data previously examined by Dr. Clifford Randall of Virginia Tech, confirms the insignificant oxygen transfer of BioMix, and validates BioMix usage in anaerobic wastewater treatment processes.

Ortho-P (as P) for Respective Anaerobic Selector Cells
Parallel Process Trains, Cells A2

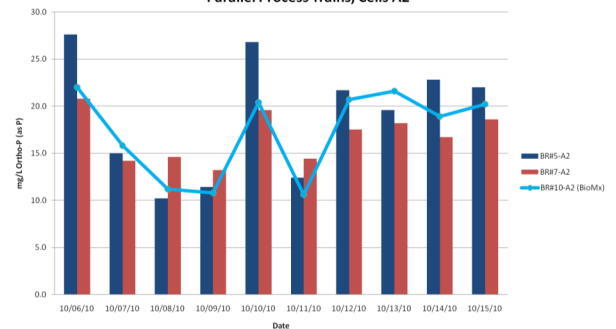


Figure 1

Figures 1 and 2 present data collected by laboratory personnel at the F. Wayne Hill WRC. Train 10, utilizing BioMix, is represented by a light blue line. Trains 5 and 7, employing submersible mechanical mixers, are represented by vertical bars.

Ortho-P (as P) for Respective Final Oxic Modified Bardenpho Cells
Parallel Process Trains, Cells C6

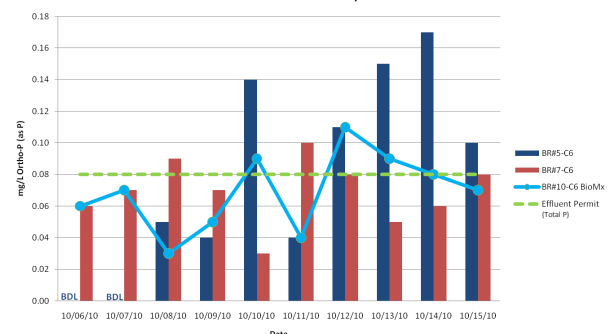


Figure 2