

# SUCCESS STORIES

AQUA-AEROBIC SYSTEMS, INC.



**PLANT NAME/LOCATION:** Millville WWTP/ Panama City, FL

**TYPE OF PLANT:** Municipal/Domestic

**DESIGN DAILY FLOW:** 5 MGD (18,928 m<sup>3</sup>/day) **PEAK FLOW:** 12.5 MGD (47,320 m<sup>3</sup>/day)

**AQUA-AEROBIC PRODUCTS:** 3-basin AquaSBR<sup>®</sup> System, (4) AquaABF<sup>®</sup> Filters

## AQUASBR<sup>®</sup> SYSTEM ACCOMODATES MILLVILLE'S LIMITED LAND SPACE

Millville WWTP located in Panama City, Florida first went online in 1948 with a trickling filter system and had an average daily design flow of 3.0 MGD. By the 1990s, the system could not meet the tightened effluent requirements for denitrification and phosphorus removal as required for discharge into the bay. To bring the plant back into compliance, an upgrade was in order. Panama City decided to research alternative treatment technologies and consulted a local engineer. The City compared a 5-stage continuous flow system and an AquaSBR<sup>®</sup> sequencing batch reactor system (SBR).

The City ultimately chose a 3-basin AquaSBR<sup>®</sup> system due to its small footprint, which could accommodate the project site's land space, low installation cost, reduced operation and maintenance costs, and capability for future increased flow capacity. The new SBR system provides a design average daily flow of 5.0 MGD and peak flow of 12.5 MGD. Since the permit only allowed for 4.0 MGD, the City decided to purchase just the aeration equipment needed to meet that capacity and would expand in the future. The SBR system started up in June of 1999 and has consistently met effluent requirements for nitrification, denitrification and phosphorus removal.



Millville's 3-basin AquaSBR<sup>®</sup> system is shown on the right and (4) AquaABF<sup>®</sup> sand filters are shown adjacent to the post aeration basins.

Millville also installed (4) AquaABF<sup>®</sup> traveling bridge sand filters and a UV disinfection process as part of the upgrade to meet effluent requirements for total suspended solids (TSS) and phosphorus levels.

Millville WWTP currently serves a population of approximately 37,000, which includes Tyndall Air Force Base, a U.S. navy base, and a community college. The city is also a well-known resort town abundant with retirees and college students on spring break so the plant serves a supplemental population as well.



FROM PRETREATMENT... TO REUSE

## PRODUCTS

*Aeration*

*Mixing*

*Biological Processes*

*Cloth Media Filtration*

*Sand Media Filtration*

*Membrane Systems*

*Controls*

*Aftermarket Products & Services*

## CAPABILITIES

*Research & Development and Engineering*

*Quality Manufacturing*

*Technical Training*

*Financing*

*International Expertise*

## CONTACT US

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## AQUASBR® SYSTEM PROCESS

The AquaSBR® system operates on a simple concept of introducing a quantity of waste to a reactor, treating the waste in a pre-determined time period, and subsequently discharging a volume of clear effluent. This "Fill and Draw" principle of operation involves the basic steps of Fill, React, Settle, Decant, and Sludge Waste. Each system is designed to include these five primary phases of operation, with the duration of each individual phase based upon specific waste characteristics and effluent objectives.

Where nutrient removal is required, a simple adjustment to the SBR's operating strategy permits nitrification, denitrification, and biological phosphorus removal without the need for separate anaerobic or anoxic reactors.

## DESIGN CHARACTERISTICS

Millville's treatment scheme includes: screen and grit removal, AquaSBR® system, post EQ basin, AquaABF® sand filters, post-aeration and UV disinfection. The AquaSBR® system consists of (3) 130' diameter basins and is followed by (4) AquaABF® sand filters (each 12.5' wide x 38' long). The SBR system and sand filters began operation in June 1999 with a design average daily flow of 5.0 MGD and peak flow of 12.5 MGD to accommodate future growth. In spring 2007, the plant requested an increased permit capacity from 4.0 MGD to 5.0 MGD. A minimal addition of treatment equipment will be required to meet this.

Millville's treatment objective is nitrification, denitrification and phosphorus removal. Following biological treatment, effluent is sent to the sand filters to further reduce TSS and phosphorus prior to UV disinfection.

## AquaABF® Filters



## 2006 AVERAGE ANNUAL OPERATING DATA

Loading	Design Influent	Avg Influent	Avg Effluent	Permit Effluent
Avg Flow mgd	5.0	2.5	-----	-----
Peak Flow mgd	10.0	-----	-----	-----
BOD <sub>5</sub> mg/l	175	216	2.5	5
TSS mg/l	200	314	2	5
TKN mg/l	45	25.8	-----	-----
Total N mg/l	-----	-----	1.2	3
Total P mg/l	10	4.5	0.4	1

## AQUASBR® SYSTEM ADVANTAGES:

- Accommodates variable hydraulic and organic loads
- Controls filamentous growth
- Provides quiescent settling
- Conserves energy via separation of aeration and mixing
- Advanced nitrogen and phosphorus removal
- Low installation costs
- Eliminates return activated sludge pumping and secondary clarifiers
- Small footprint
- Simple to expand or upgrade
- One company accountability

## AQUAABF® FILTER ADVANTAGES:

- Continuous filtration, even during backwash
- No backwash or washwater holding tanks
- As little as 6" headloss through filter; will not force solids through media
- Surface mat filtration - no mudball formation
- Continuous static head above media prevents air entrapment under porous plate
- Only 1-2% of daily flow required for backwash
- Low maintenance; no pipe galleries or air blowers
- Lower capital cost and installation cost
- Fully automatic / minimal operator attention