



AQUA-AEROBIC SYSTEMS, INC.
A Metawater Company

SUCCESS STORIES

PLANT NAME AND LOCATION
SPRINGFIELD WWTP - SPRINGFIELD, KY

DESIGN DAILY FLOW / PEAK FLOW
0.88 MGD (3331 M³/DAY) / 1.70 MGD (6435 M³/DAY)

AQUA-AEROBIC SOLUTION
DUAL-BASIN AquaSBR® SYSTEM

AquaSBR® SYSTEM REPLACES OXIDATION DITCH AND SOLVES SPRINGFIELD'S OPERATION AND MAINTENANCE PROBLEMS

The Springfield, KY wastewater treatment plant treats domestic and industrial waste. The plant receives industrial waste from apartment houses, schools, and other local businesses. Two of the industrial businesses provide 18% of the plant's total flow.

The original plant, built in 1939, utilized a trickling filter for its secondary treatment process. When upgrading took place in 1987, the trickling filter was replaced with two oxidation ditches. Shortly following the installation of the ditches, the plant began experiencing repeated operation and maintenance problems with the mixing and aeration equipment. Specifically, the oxidation basins had to be drained and the diffuser stones had to be replaced often.

In 1989, a diagnostic evaluation was done on the plant by the Kentucky Division of Water. It concluded that the plant needed to find a solution to its operation and maintenance problems in order to run efficiently. To find a possible solution, an engineer was hired to investigate other treatment technologies. The options he presented included retrofitting the existing basins or keeping the oxidation ditches. Both of these options were too costly so the plant made a preliminary decision to build a large lagoon instead. The lagoon was never built, however, because a new option that was not previously investigated was brought to Springfield's attention.



One of the retrofitted concrete basins at Springfield WWTP.

The new option was an AquaSBR system which was presented by Aqua-Aerobic personnel and its representative. Interested, Springfield operators decided to visit other plants that were already utilizing an AquaSBR system. In doing so, they learned that AquaSBR equipment was easily retrievable, only one man was needed to maintain it, and that Aqua-Aerobic had an outstanding reputation for equipment quality and strong customer service. The fact that the system could be retrofitted into their existing concrete basins (one of the basins is shown in the photo above) at a lower cost was an added advantage. The plant decided to purchase a dual-basin AquaSBR system in 1997.

AquaSBR® SYSTEM PROCESS

The AquaSBR system operates on a simple concept of introducing a quantity of waste to a reactor, treating the waste in an adequate time period, and subsequently discharging a volume of effluent plus waste sludge that is equal to the original volume of waste introduced to the reactor. This "Fill and Draw" principle of operation involves the basic steps of Fill, React, Settle, Decant, and Sludge Waste. The system may be designed to include seven individual phases of operation but the inclusion or duration of any individual phase is based upon specific waste characteristics and effluent objectives.

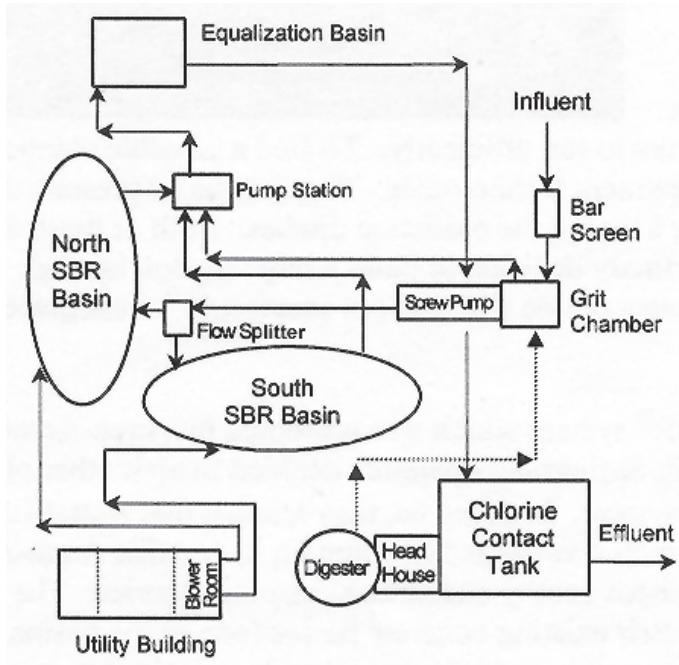
Where nutrient removal is required, a simple adjustment to the SBR's operating strategies permits nitrification, denitrification, and biological phosphorus removal. Optimum performance is attained when two or more reactors are utilized in a predetermined sequence of operation.

DESIGN CHARACTERISTICS

The plant's average design daily flow is 0.88 mgd (3331.19 m³/day) and the peak daily flow is 1.7 mgd (6435.25 m³/day).

The dual-basin AquaSBR system allows Springfield, KY to meet or exceed KPDES permit limits.

CURRENT PROCESS FLOW



AVERAGE OPERATING DATA (2002)

LOADING	DESIGN INFLUENT	AVG INFLUENT	DESIGN EFFLUENT	AVG EFFLUENT
AVG Flow mgd	0.88	0.65	----	----
Peak Flow mgd	1.70	1.70	----	----
BOD mg/l	255	131.8	30	3.5
TSS mg/l	350	207.8	30	4.4
NH ₃ mg/l	----	17.0	4	.82

AquaSBR® SYSTEM ADVANTAGES

- All components retrievable and accessible
- Tolerates variable hydraulic loads
- Controls filamentous growth
- Tolerates variable organic loads
- Provides quiescent settling
- Separation of aeration and mixing
- Lower installation costs
- Return activated sludge pumping eliminated
- Small footprint
- Simple to expand or upgrade
- One company accountability