SUCCESS STORIES

AQUA-AEROBIC SYSTEMS, INC.

PLANT NAME/LOCATION: Oak Hill, WV WWTP (Plant #1 & Plant #2)

TYPE OF PLANT: Municipal/Domestic

DESIGN FLOW OF PLANT #1: 0.75 MGD (2839 m^3/day) **PEAK FLOW:** 1.5 MGD (5678 m^3/day)

DESIGN FLOW OF PLANT #2: 0.30 MGD (1136 m^3/day) **PEAK FLOW:** 0.60 MGD (2271 m^3/day)

AQUA-AEROBIC PRODUCTS: Dual-basin AquaSBR® System

OAK HILL CHOSE THE SPACE-EFFICIENT AQUASBR® SYSTEM TO PRESERVE THE BEAUTIFUL TERRAIN OF THE APPALACHIAN MOUNTAINS

In 1948, the wastewater treatment facility of Oak Hill, West Virginia, consisted of an Imhoff tank, trickling filter, and chlorination. After 40 years of use by this growing community, city officials realized it was time to replace the outdated system with a new, state-of-the-art wastewater treatment system that would meet current needs and accommodate Oak Hills' continuing growth.

Oak Hill, being located in the Appalachian Mountains, had several limitations that had to be considered in designing a new plant. Because the mountains divided the city into east and west sections, it was determined that wastewater treatment would have to be met by two separate facilities. Gravity and drainage patterns would dictate where the influent flow would be sent.

In addition, the terrain required Oak Hill's new facilities to be space efficient since there was no room to install aerated stabilization basins or a conventional flow-through activated sludge system. With these facts in mind, City Manager, Tom Oxley and Pentree, Inc. Vice President, Wilbur Smith (consulting engineer) explored various options. Both concluded that an AquaSBR system would best suit Oak Hill's needs.

The installation of the new AquaSBR system was to be completed in two phases, constructing two separate plants. Plant #2, the smaller plant at Loop Creek, was the first to go on-line in November of 1989. Plant #1, (shown in the photo above) at Arbuckle Creek, went on-line in March 1992 and was determined the main plant due to its larger drainage pattern. Even though this plant was harder to construct due to solid rock on that side of the mountain, Oak Hill said it was still less expensive than trying to re-construct the old plant.

FROM PRETREATMENT...TO REUSE

PRODUCTS

Aqua-Jet®
Surface Aerator

Aqua-Jet II®
Contained Flow Aerator

AquaABF®
Automatic Backwash Filter

MixAir®
Aeration System

AquaDDM®
Direct Drive Mixer-Blender

AquaSBR®
Sequencing Batch Reactor

AquaDisk®
Cloth-Media Filter

AquaDiamond™
Cloth-Media Filter

AquaDrum™
Cloth-Media Filter

ThermoFlo®
Spray Cooler

Aqua EnduraDisc®
Fine Bubble Diffuser

Aqua EnduraTube™
Fine Bubble Diffuser

Aqua CB-12™
Coarse Bubble Diffuser

Aqua CB-24®
Coarse Bubble Diffuser

AquaMB Process™
Multiple-Barrier Membrane System

MSBR®
Modified Sequencing Batch Reactor

SERVICES

Process and Mechanical Engineering

Quality Manufacturing

Aftermarket Sales & Service

International Expertise

CONTACT US

Aqua-Aerobic Systems, Inc.
6306 N. Alpine Rd.
Rockford, IL 61111
Phone: 815.654.2501
Fax: 815.654.2508
www.aqua-aerobic.com

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

Plant #1 has an average design daily flow of 0.75 mgd (2839 m3/day) with a peak flow of 1.5 mgd (5678 m3/day). Plant #2, the smaller plant, has an average design daily flow of 0.30 mgd (1136 m3/day) with a peak flow of 0.60 mgd (2271 m3/day). Plant #2 also differs from Plant #1 by having two storm flow basins incorporated into its design so that the system can not be washed out.

Plant #1 Avg. Operating Data 1/97-10/00

Loading	Design Influent	Avg Influent	Avg Effluent	Permit Effluent
Avg Flow mgd	0.75	0.57	--------	--------
Peak Flow mgd	1.50	1.12	--------	--------
BOD_5 mg/l	220	280.25	8.42	20 summer 30 winter
TSS mg/l	220	221.36	16.60	30
NH_3 mg/l	25	--------	4.29	6.5 summer 15 winter

Careful consideration was given to the appearance of the plants in order to ensure their blending inconspicuously into the mountain's beautiful terrain. This was a strong factor for choosing the space-efficient AquaSBR system.

Plant #2 Avg. Operating Data 11/97-10/00

Loading	Design Influent	Avg Influent	Avg Effluent	Permit Effluent
Avg Flow mgd	0.30	0.27	--------	--------
Peak Flow mgd	0.60	0.60	--------	--------
BOD_5 mg/l	200	272.24	15.97	20 summer 30 winter
TSS mg/l	220	210.26	14.02	30
NH_3 mg/l	25	--------	2.38	6.5 summer 15 winter

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

Butch Whitmore, Plant # 2 Superintendent, says *"We wanted to keep maintenance costs as low as possible". "With the AquaSBR system, everything is serviceable from outside the treatment tanks".*