

SUCCESS STORIES

AQUA-AEROBIC SYSTEMS, INC.



PLANT NAME/LOCATION: Abbottstown-Paradise Joint Sewer Authority/Abbottstown, PA

TYPE OF PLANT: Municipal/Domestic

DESIGN DAILY FLOW: 0.35 MGD (1325 m³/day) **PEAK FLOW:** 0.79 MGD (2990 m³/day)

AQUA-AEROBIC PRODUCTS: Dual-basin AquaSBR[®] System, Aqua SCADA System

ABBOTTSTOWN RETROFITTED A CONTINUOUS FLOW THROUGH SYSTEM WITH AN AQUASBR[®] SYSTEM TO MEET STRINGENT EFFLUENT REQUIREMENTS

The Abbottstown-Paradise Joint Sewer Authority was incorporated in 1973 and utilized a continuous flow activated sludge system with an average daily design flow of 0.21 MGD. At that time the plant was only required to reduce total suspended solids (TSS) and effluent ammonia to required levels to serve the area population of about 2000. Due to urban growth and increased storm flow runoffs, the plant was in need of an expansion and upgrade by the late 1990s. The existing plant had reached its hydraulic capacity and was subject to solids carryover during high flows. The plant was also having difficulty in meeting its ammonia limits. To find a solution to its problem, Abbottstown turned to the local consultant, C.S. Davidson, Inc. to perform an evaluation on upgrade and expansion options and provide a recommendation.

C.S. Davidson considered several options in their evaluation. These options included the expansion of the existing flow-through system, installation of a new AquaSBR[®] sequencing batch reactor system, and installation of a flow-through activated sludge process with sequenced anoxic and aerobic phases. C.S. Davidson visited numerous installations utilizing the alternative technologies and completed an appraisal of Abbottstown before presenting their recommendation. The ultimate solution was to purchase a dual-basin AquaSBR[®] system, which was to be retrofitted into the existing continuous flow-through system. The AquaSBR[®] system was the most cost-effective alternative and the system would accommodate the future stringent effluent requirements for ammonia and phosphorus.



Abbottstown's dual-basin AquaSBR system is shown on the right.

Design for the plant upgrade was initiated in 2000 and construction began in 2002. The new AquaSBR[®] system went into operation in 2003 and has consistently produced effluent quality well below Abbottstown's permit limits. To optimize process control and plan for future nutrient removal requirements, expected to be mandated by the state within five years after startup, an Aqua SCADA control system was also incorporated into the design.



FROM PRETREATMENT... TO REUSE

PRODUCTS

Aeration

Mixing

Biological Processes

Cloth Media Filtration

Sand Media Filtration

Membranes

Controls

Aftermarket Products & Services

CAPABILITIES

Research & Development and Engineering

Quality Manufacturing

Technical Training

Financing

International Expertise

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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.

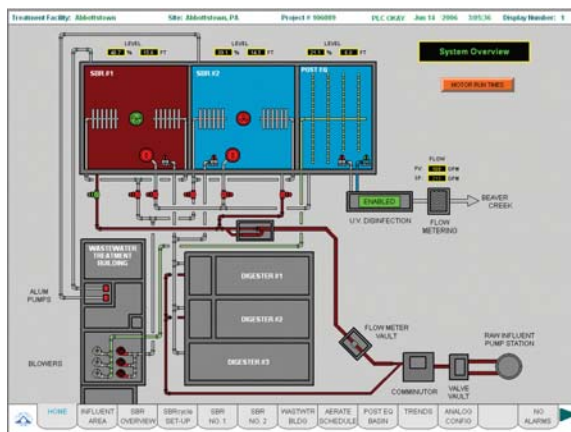
Where nutrient removal is required, a simple adjustment to the SBR's operating strategy permits nitrification, denitrification, and biological phosphorus removal without the need for separate anaerobic or anoxic reactors.

DESIGN CHARACTERISTICS

The dual-basin AquaSBR® system was designed to treat an average daily flow of 0.35 MGD and peak flow of 0.79 MGD. The upgraded SBR system allows the plant to meet the state's stringent effluent requirements for ammonia and phosphorus and to handle the storm flows experienced by the plant.

To optimize the plant's process control with the upgraded system, an Aqua SCADA control system was also incorporated into the design. The system allows for data trending and provides additional process control functions such as on-line analyzers for key process control parameters.

SCADA Screen for AquaSBR System Overview



2005 AVERAGE ANNUAL OPERATING DATA

Loading	Design Influent	Avg Influent	Avg Effluent	Permit Effluent
Avg Flow mgd	0.35	0.15	-----	-----
Peak Flow mgd	0.79	-----	-----	-----
BOD₅ mg/l	265	322	1.49	15 (May - Oct) 25 (Nov -Apr)
TSS mg/l	250	251	3.8	30
NH₃-N mg/l	40	-----	0.28	1.5 (May - Oct) 4.5 (Nov -Apr)
Total P mg/l	8	-----	1.34	2.0

Chief Operator, John Scrivens says, "The AquaSBR® system works great and is user-friendly."

AQUASBR® SYSTEM ADVANTAGES:

- Accommodates variable hydraulic and organic loads
- Controls filamentous growth
- Provides quiescent settling
- Conserves energy via separation of aeration and mixing
- Capable of 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

AQUA SCADA SYSTEM ADVANTAGES:

- Plant optimization
- Single point of control for plant-wide monitoring
- Detailed, dynamic graphics depicting equipment status and PLC command status
- Simple, intuitive navigation between screens
- Historical trending and logging of data
- Consolidated alarming of all SCADA accessed areas
- Remote access for operations personnel and/or Aqua-Aerobic support
- Optional electronic O&M Manual
- Upgrade capabilities for existing controls

