

SUCCESS STORIES

AQUA-AEROBIC SYSTEMS, INC.



FROM PRETREATMENT... TO REUSE

TYPE OF PLANT: Industrial/Chicken Processing

DESIGN DAILY FLOW: 1.3 MGD (4920 m³/day)

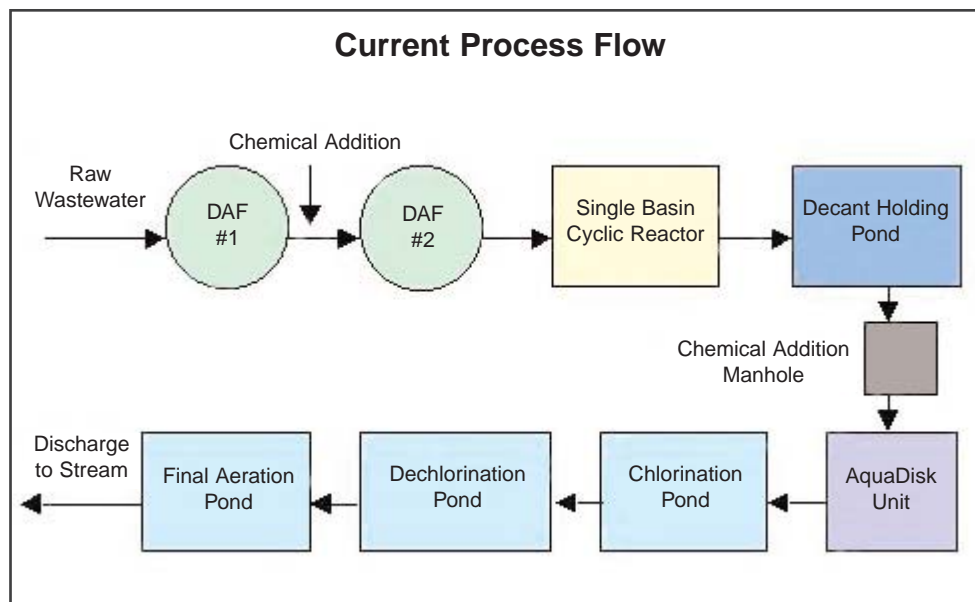
AQUA-AEROBIC PRODUCTS: 1 AquaDisk[®] Filter (6-disk)

AQUADISK[®] FILTER MEETS REQUIREMENTS FOR PHOSPHORUS AND TSS REMOVAL IN CHICKEN PROCESSING PLANT

A chicken processing plant located in Berlin, MD has been in operation since the 1960s and currently processes about one million birds a week, generating 1.0 mgd of process wastewater. Its original wastewater treatment system consisted of aerated lagoons followed by a facultative lagoon system as its primary treatment. Gradually, the plant expanded the system by adding two DAF (Dissolved Air Flotation) units to the front of the primary treatment system.

In 1991, the plant received a NPDES permit with a five-year compliance plan defining stricter limits on the discharge of soluble organics and nutrients during summer months. As an interim alternative to conform, the company constructed a spray irrigation system.

Aware that the next permit issued in 1996 would require a year-round limit of 0.5 mg/l on phosphorus levels, the plant decided to seek out cost-effective secondary and tertiary treatment systems. The innovative AquaDisk cloth media filter and conventional sand media filters were investigated for possible tertiary treatment methods in 1994. At this time, the plant's wastewater treatment



system consisted of two DAF units, a primary aerated lagoon, a secondary facultative lagoon, and a chlorination pond followed by a final aeration pond.



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

THE PILOT STUDY

The plant conducted a pilot study with a single-disk AquaDisk filter in the spring of 1994 to test its performance of phosphorus removal in combination with four different coagulants; ferric chloride, ferric sulfate, aluminum chloride, and aluminum sulfate.



The results confirmed the filter's ability to meet the effluent phosphorus requirement of 0.5 mg/l so the plant purchased a 6-disk AquaDisk filter.

The filter was to be part of their upgraded treatment system which was completed in 1995 and still exists. The new system consists of two DAF units, a Single Basin Cyclic Reactor, a Decant Holding Pond, an AquaDisk Filter, a Chlorination Pond, a Dechlorination Pond and a Final Aeration Pond (see schematic on front page).

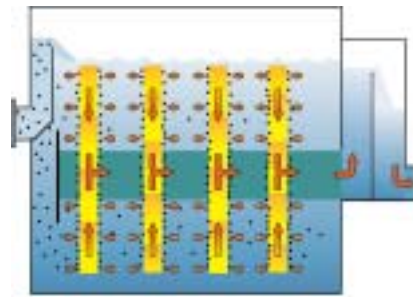
DESIGN CHARACTERISTICS/OPERATION

The 6-disk filter (9.2' wide x 10.6' long x 10.83' deep) (2.8m x 3.23m x 3.3 m) has a design daily flow of 1.30 mgd (4,921 m³/day) and solids loading of 1.9 lbs/ft²/day (9.28 kg/m² /day) of TSS. The filter receives the daily flow at a rate of 0.79 mgd (2,990 m³/day). Approximately 0.30 mgd (1,136 m³/day) of its treated water is recycled prior to filter treatment for nonpotable uses in its protein conversion plant.

The AquaDisk filter reduces total phosphorus to effluent levels of 0.5 mg/l or less and TSS to levels of 10 mg/l or less.

AQUADISK® FILTER PROCESS

Clarified effluent flows by gravity through the cloth media of the stationary hollow disks. The filtrate exits through the hollow shaft which supports the individual disks. The operation of the AquaDisk filter is depicted in the illustration below.



As solids accumulate on the surface of the media, the water level surrounding the disks rises. Once a predetermined level is reached, the disks rotate and the media surface is automatically vacuum backwashed clean. Solids settle to the bottom of the tank and are then pumped to a digester or to the plant headworks.

AQUADISK® FILTER ADVANTAGES:

- Higher quality effluent
- Lower backwash rates
- Tolerates extreme variations in loads
- Reuse quality effluent
- Continuous filtration during backwash
- Small footprint
- Eliminates sand media and underdrains