



AQUA-AEROBIC SYSTEMS, INC.  
A Metawater Company

# APPLICATION PROFILE

APPLICATION  
COAL ASH / COAL FINES TREATMENT

INDUSTRY  
POWER AND ENERGY

AQUA-AEROBIC SOLUTION  
Aqua-Aerobic® CLOTH MEDIA FILTRATION

## CLOTH MEDIA FILTRATION REMOVES COAL ASH AND COAL FINES AT POWER PLANTS

### The Challenge

Coal-fired power plants generate coal fines and coal ash from a number of sources, including coal combustion residuals (CCR), particularly fly and bottom ash from coal furnaces, and coal pile runoff during rain events. The impact of coal ash and coal fines to the environment and public health are well-documented, potentially through contamination of surface and ground waters, or by air pollution.

Wet handling systems mix fly and bottom ash with water, known as “sluicing”, and this transport water must be treated. Coal ash transport water and coal pile run-off can be treated separately or combined (even with Flue Gas Desulphurization (FGD) residual solids). Coal fines and residual ash are small particle-size solids, typically accumulated and later removed through a multi-step settling process in large area, surface impoundments known as coal ash ponds. The dewatered solid waste of coal ash and fines must be disposed of appropriately, in accordance with state and federal requirements.

### The Solution

In support of an industry-wide effort to reduce, improve, and remove coal ash ponds, a variety of technologies have been tested and employed. In these applications, aqueous streams containing coal

ash and coal fines are filtered to a suitable effluent quality, either after or instead of a coal ash pond.



Industrial Power Plant Skyline

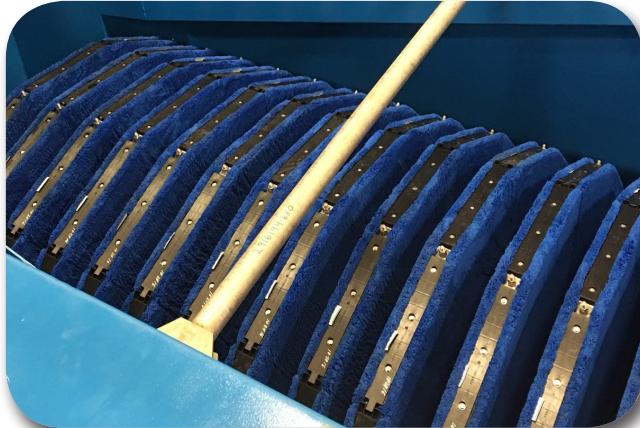
### The Proven Result

Aqua-Aerobic tested and operated its pile cloth media filter featuring OptiFiber® media to remove coal ash and coal fines from power plant coal pile runoff and effluent wastewater streams. Field testing after a coal ash settling pond (without chemical addition) showed average TSS removal of 75%. Excluding a peak event, the influent TSS range was 20 - 50 mg/L and effluent 1 - 20 mg/L. The peak event went over 150 mg/L influent, and had an effluent of 35 mg/L.

Including the peak event, average influent, effluent, and removal were 43 mg/L, 10 mg/L and 76%, respectively (see Table 1).

The installed full scale system, currently in operation, was designed to treat a maximum flow rate of 18,000 gpm (26 MGD) using three Aqua MegaDisk® package units. Additional valves and controls provide the flexibility to manage variable hydraulic and solids loading conditions.

Aqua-Aerobic pile cloth media filters are available in a number of configurations, including the AquaDisk® and Aqua MegaDisk®. The equipment designs are highly effective methods of removing coal ash and coal fines prior to discharge. These systems offer a compact footprint, simple operation, and extremely low maintenance with minimal moving parts.



Internal View of Aqua MegaDisk® Cloth Media Filters with OptiFiber PES-14® Cloth Filtration Media

The recommended design will meet the hydraulic conditions, loadings, and available footprint. Retrofit options can be evaluated utilizing existing basins and tanks. While this particular application does not typically require chemical addition, chemical feed options can be tested and considered. The most suitable technology will be optimized for the application and unique process characteristics. Final designs can integrate preferred components, controls and materials of construction.

#### OptiFiber PES-14® TSS Removal Performance

Normal Influent TSS	20 - 50 mg/L
Peak Influent TSS	150 mg/L
Normal Effluent TSS	1 - 20 mg/L
Peak Effluent TSS	35 mg/L
Average TSS Removal	76%

Table 1: TSS Removal Performance of OptiFiber PES-14® Cloth Filtration Media Treating Coal Ash Settling Pond Effluent

#### Aqua MegaDisk® FILTER ADVANTAGES

- Fewer filters required, resulting in a smaller footprint and lower capital and operating costs
- Lightweight, removable disk segments for ease of maintenance
- Low energy consumption since disks are stationary, except when backwashing
- Fewer pumps and valves needed means lower maintenance costs
- Higher solids and hydraulic loading rates
- Utilizes engineered OptiFiber® cloth filtration media
- Produces consistent, reuse-quality effluent
- Backwash system fluidizes fibers for efficient release of stored solids
- Tolerates extreme variations in load
- Vertically oriented disks reduce required footprint
- Low backwash volume results in water savings and energy reduction
- Available in painted steel, stainless steel or concrete tanks
- Eliminates sand media and underdrains