



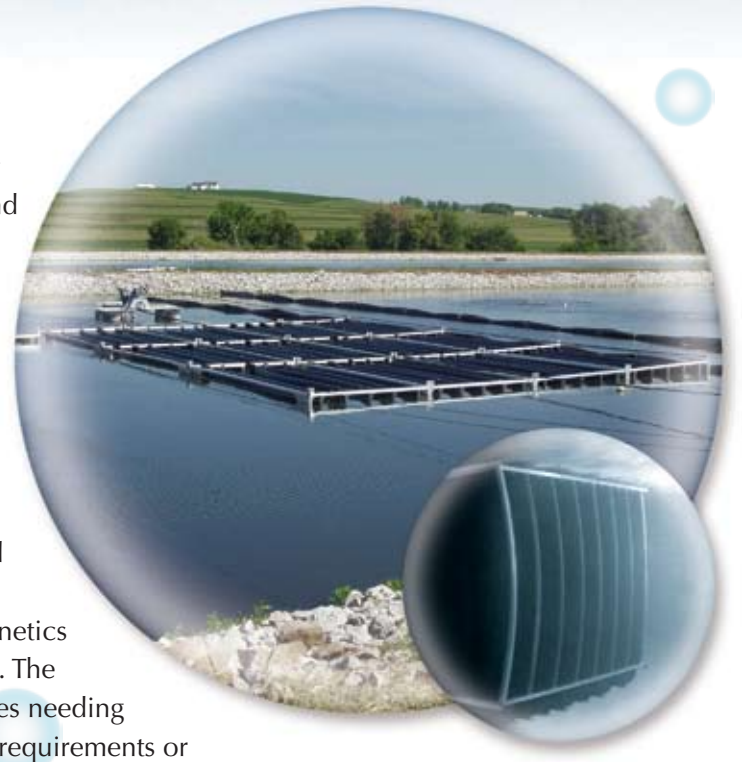
**Aeration  
Industries®**

## **Aire-O<sub>2</sub> Bio-ffilm™** Fixed Film Media System

### **Achieve Year-Round Ammonia Removal Using In-Situ Fixed Film Media**

Aeration Industries' Aire-O<sub>2</sub> Bio-ffilm™ fixed film media system offers a cost-effective wastewater treatment facility upgrade that increases plant performance and capacity and facilitates year-round nitrification. The Bio-ffilm system is a submerged attached-growth media process using proprietary geotextile technology with a high effective surface area.

Our engineers have integrated the media into a treatment system using Aire-O<sub>2</sub> Triton® aerators to establish and maintain biological growth on the media. The aerators are sized and oriented relative to the media arrangement to provide the proper amounts of mixing and aeration for solids suspension, nutrient treatment, and oxygen diffusion. The aerators also maximize treatment kinetics by maintaining higher basin temperatures in cold weather. The system is ideal for municipal wastewater treatment facilities needing advanced treatment upgrades to meet more stringent EPA requirements or capacity increases.

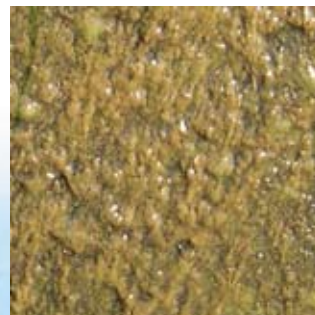


### **Aire-O<sub>2</sub> Bio-ffilm™ Fixed Film Media Benefits:**

- The concentrated biomass creates conditions for a high degree of nitrification year-round.
- All necessary equipment is float-mounted and easy to install directly in existing lagoons. No new construction is required.
- Process is self-regulating and requires no maintenance.
- Dense biomass communities on the fixed film increase Solids Retention Time (SRT) in the system.
- Media can also be added to enhance BOD removal.
- Adding Bio-ffilm media decreases F/M ratio which allows for possibility of applying higher influent loadings to the process.
- Circulation of wastewater horizontally in multiple passes through fixed film media channels using Aire-O<sub>2</sub>® aerators maximizes treatment efficiency.
- Fixed film processes are inherently stable and resistant to organic, toxic, and hydraulic shock loadings.
- Lagoons can be divided into discrete cells using floating baffles to further optimize process treatment.
- Optional modular insulated cover system insures treatment kinetics are maximized year-round in cold environments.



*Before: Bio-ffilm media surface.*



*After: Bio-ffilm media with established biomass growth.*

# Aire-O<sub>2</sub> Bio-ffilm™ Fixed Film Media System

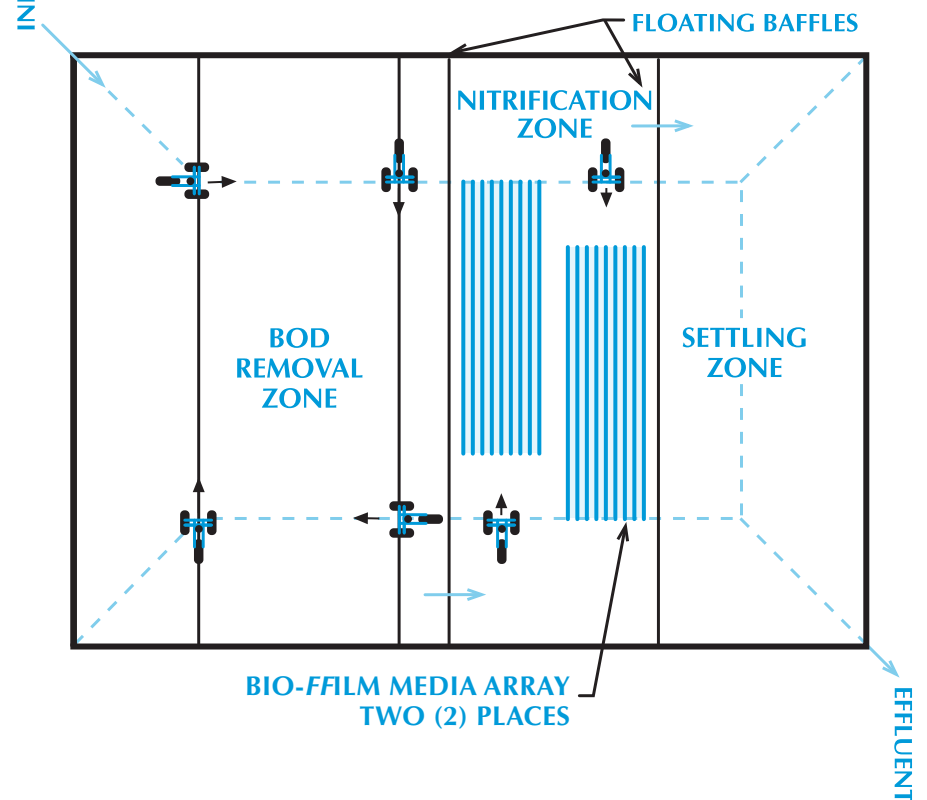
**Data:** A typical Bio-ffilm design involves separating the lagoon into three main treatment zones.

**BOD Removal Zone:** Treatment zones are established in the lagoon using floating baffle walls to improve the treatment efficiency of the process. The majority of BOD removal occurs in the first cell through standard suspended growth treatment mechanisms. Aire-O<sub>2</sub> Triton® aerator/mixers are installed to provide complete mix conditions in this treatment cell. A high mixing intensity is used to insure a maximum degree of BOD removal. With an approximate effluent BOD of 20 mg/l, flow progresses through a submerged opening in the baffle wall into the nitrification zone.

**Nitrification Zone:** Since the heterotrophic BOD removing bacteria inhibit the growth of nitrifiers, there is minimal nitrification in the first cell. The majority of nitrification occurs in the second cell with the help of Aire-O<sub>2</sub> Triton® aerator/mixers paired with fixed film media arrays. The fixed film in combination with the aerators creates the perfect environment for the nitrifiers, which favor attached growth treatment mechanisms. The aerator and the media array combinations are arranged to facilitate multiple passes of the wastewater through the Bio-ffilm channels, maximizing treatment efficiency. Flow progresses through a submerged opening in the baffle wall into the settling zone.

**Settling Zone:** The third cell is used for settling the TSS and biological solids prior to effluent discharge. This cell can be covered to prevent the growth of algae and duckweed, which can negatively impact the effluent quality. The result is a high quality effluent achievable on a year-round basis.

## Typical Lagoon Design Upgraded with Bio-ffilm System



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