

Bioaugmentation for Municipal Sewerage Lagoons

Lagoon systems are one of the most common methods of water treatment around the world. By providing extended hydraulic retention time (HRT), lagoons rely on the native biology in raw sewage to degrade organic matter. However, relying on native biological action and natural settling as a form of treatment is typically only partially successful at achieving desired effluent quality. Lagoon systems provide low operational cost alternatives but face many challenges such as malodor generation, inefficient degradation capabilities, excessive sludge accumulation and ground and surface water contamination risks (among many others). Addressing these issues may require costly investments in the long term.

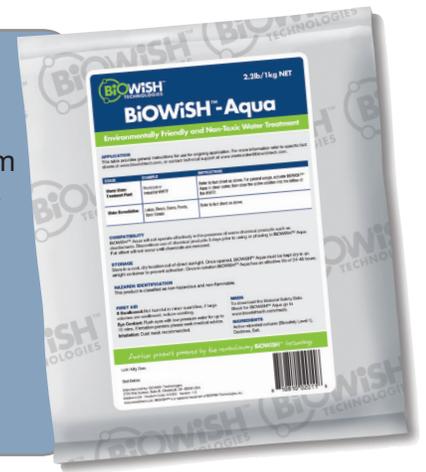
BiOWiSH™ Aqua bioaugmentation programs deliver cost-effective, easy-to-implement solutions to most of the problems these systems face.

What is BiOWiSH™ Aqua?

BiOWiSH™ Aqua is a proprietary composite biocatalyst that enhances a broad range of hydrolytic, oxidative and reductive biochemical reactions. BiOWiSH™ contains a novel consortium of metabolically cooperative microorganisms, with endogenous and exogenous enzymes and small molecule metabolic co-factors. BiOWiSH™ products are composed of all natural materials and are non-genetically modified.

Benefits

- Accelerates the decomposition of organic waste
- Promotes solids degradation which reduces the accumulation of bottom sludge over time and increases system retention time and performance
- Reduces odors
- Improves final discharge water quality
- Operates in anaerobic and aerated lagoons
- Specially formulated BiOWiSH™ Aqua FOG provides additional natural degradation capabilities to reduce fats, oils and grease contaminants



How safe is BiOWiSH™ Aqua?

BiOWiSH™ Aqua has no detrimental effects on the environment, humans, plants or animals. The core technology behind BiOWiSH™ products is also used in human ingestible supplements, animal feed additives and crop enhancement products also produced by BiOWiSH Technologies. Environmental toxicology studies have shown no adverse effects from the use of BiOWiSH™ products. Aquatic toxicity testing has shown that BiOWiSH™ is non-toxic at recommended dosage levels.

Does BiOWiSH™ Aqua build up in the plant or discharge locations?

No. Unlike some other water quality conditioning agents BiOWiSH™ will not build-up over time. BiOWiSH™ is 100% biodegradable which prevents any long-term build up.

Dosing Recommendations

The following recommendations are based on rudimentary systems using one or more sequential lagoons (or other units of advanced treatment). For different system setups please contact wastewater@biowishtech.com.

Dose	BiOWiSH™ Aqua	Basis used for calculation	Target concentration	Notes
Shock dosing	0.5 kg/1,000 cubic meters of lagoon capacity	Total system volume	0.5 ppm	Shock dosing is a single dosing event and is meant to bring the entire system to an even initial product concentration.
Maintenance Dosing	0.2 – 0.5 kg/ 1,000 cubic meters of inlet flow	Total daily flow	0.2 – 0.5 ppm	Up to 14 days of product can be prepared and the active solution can be drip-dosed into the system's inlet.

Systems with significant solids build-up will require increased initial dosing concentrations of 0.5 – 1.0 ppm for the first month. If Fat, Oil and Grease (FOG) levels exceed 100 mg/L use BiOWiSH™ Aqua FOG. BiOWiSH™ Aqua FOG is specially formulated with a natural surfactant to provide additional degradation capabilities to high fats, oil and grease systems

General Application Instructions

Shock Dosing

Product can be applied directly as a solid or dissolved in water for added simplicity (see photos below).



Solid Dosing: Add the BiOWiSH™ powder concentrate to the lagoon's inlet.



Liquid Dosing: Dissolve the BiOWiSH™ powder concentrate in water and apply.

Maintenance Dosing

Product can be added as a solid or dissolved in water for controlled dosing.



Liquid Dosing: Dissolve the BiOWiSH™ powder concentrate in clean water (at a minimum rate of 10 L/kg). Active solution can be drip-dosed directly to the lagoon inflow or for lagoons with HRT > 24 hours, poured into the lagoon on a weekly basis.

Solid Dosing: For systems under 24 hours hydraulic retention time, add the dry product to the lagoon on a daily basis. For HRT above 24 hours, add required amount of product on a weekly basis.

How will I know BiOWiSH™ Aqua is working?

The collection of data is critical to tracking the progress of BiOWiSH™ in meeting key objectives. We recommend that before implementing a dosing program, first establish a detailed baseline of water quality analysis to measure against.

Lagoons should show visible signs of increased biological activity within weeks of initial dosing. Bioaugmentation will always cause a period of high activity and initial measurable instability in the system. Lagoons with large volumes of sludge (especially lagoons with no concrete construction or impermeable lining) can experience a noticeable peak in suspended solids (TSS) during the first month and increased metabolic action in the sludge may contribute to buoyancy and increased odors. This is a positive indication of the acceleration of biological activity in the system.

These initial occurrences will disappear once the system reaches a new and more efficient steady state. This phase normally takes 4 to 8 weeks. In a typical system sludge levels will substantially reduce in 3 to 6 months and optimal retention times and treatment outcomes will be attained from this point with continued maintenance dosing.

Contacts

BiOWiSH Technologies

Tel: +1 312 572 6700

Fax: +1 312 572 6710

Website: www.biowishtech.com

Email: wastewater@biowishtech.com

Biological help for the human race



www.biowishtech.com

BiOWiSH™ is a registered trademark of BiOWiSH Technologies, Inc. v 2.0