Floating wetland versus constructed wetland

Fact sheet

Permitting criteria to meet water quality standards and to protect aquatic ecosystems are becoming increasingly stringent. However, available space, capital and operational spending can't always be increased.

frog environmental are the UK and EU licensee for BioHaven Floating Treatment Wetland (FTW) technology.

We are using our experience of ecological engineering and water treatment processes to design more versatile, efficient and effective reed bed technology, with reference projects from around the world.

BioHaven FTW installations can lead to a reduction in operational costs as well as more consistent treatment efficacy.

Landfill leachate treatment. McLeans Pit, Greymouth, NZ

Wastewater treatment lagoon. Kerepehi, NZ

BioHaven is a unique product with a patented design.

BioHaven is set apart from other floating islands and reed raft products by several fundamental points:

Very high surface area matrix. BioHaven is made from a high surface area non-woven recycled plastic. The thick layers of matrix and high reactive area encourage the formation of biofilms and allow biogeochemical processes to take place.

Plant success rates. The non-woven base materials protects and supports the rhizome, allowing roots to intertwine with the base and provide a strong reliable support for plant establishment and long term success.

Internal buoyancy. Internal buoyancy eliminates the need for an external frame that other floating islands rely upon. The frames of conventionally designed islands can lead to structural failure.

Flexible structure. BioHaven has the ability to absorb and dissipate shocks and wave energy. The system can be manufactured to meet site specific requirements.

Long design life. The construction process and materials use has been proven to deliver a long product design life, with the first BioHavens installed soon reaching their 20th anniversary.

Research & Development. BioHaven FTWs have been the subject of over 15 years of R&D and field tests. Much of the peer-reviewed literature around FTWs is specific to BioHaven and not deemed transferable.

frog environmental are EU licensee for BioHaven technology, chartered environmental professionals and experts in aquatic ecology and water quality with wastewater treatment design capabilities.

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A BioHaven FTW system has several key advantages over a conventional constructed wetland.

BioHaven FTWs use and improve on the naturally occurring phenomenon of fixed film treatment. Offering the advantage of symbiosis, the extensive plant root system increases the available oxygen, which promotes a higher rate of microbial activity.

Sediment overloading of a constructed wetland can cause surface tracking to occur and therefore loss of treatment area. BioHaven FTW design for sediments to be accreted in the basin of the pond where they may be removed without taking the treatment offline.

Longer retention times and higher biodiversity levels within the BioHaven FTW allow for more complete biological treatment of contaminants and pathogens.

Baffles and cascades can be utilised to process flow and improve treatment efficiency working to improve treatment performance within a smaller footprint.

Operational failures can be avoided with respect to plant die off as a result of water level management with a BioHaven FTW as the system responds to the changing water levels to ensure that there is always sufficient water without ever becoming inundated.

Dead plant litter does not impair the treatment process by clogging the surface gravels, oxidising more rapidly on the surface of the FTW and providing additional treatment capacity. A FTW system will provide consistent performance.

Less onerous and lower costs associated with maintenance.

BioHaven FTWs are constructed from a recycled plastic. There is no requirement for any other filter media during construction and refurbishment reducing the embodied energy and associated carbon.

There is less hazardous waste produced, reducing costs associated with gravel extraction, cleaning and disposal to landfill. The waste sludge is organic and in many cases suitable for anaerobic digestion and biogasification.

Odour management and BOD reduction in an anaerobic pond. Marton, NZ

Key facts

73-92% reduction in BOD

69-99% reduction in Nitrate

38-69% reduction in Phosphorus

Trials show reductions in propylene glycol as well as the endocrine disruptor Bisphenol-A

The approach to design using FTW is grounded in solid, peer reviewed science and multiple reference projects from around the world. Whilst BioHaven is deemed new and innovative by some, it is a proven approach and utilises the fundamental biological basics of wastewater treatment.

A BioHaven FTW represents a future proofed system that will be able to fulfill the evolving objectives of WFD whilst ensuring a low cost and zero energy approach to effective water treatment.

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