Eliminating Odors Using BioHaven® Technology

Project Location: Marton, New Zealand

This case study summarizes results of a unique configuration of Floating Island International's (FII) patented BioHaven® floating treatment wetland (FTW) technology to mitigate wastewater odor. This was the first application of FTWs specifically to reduce/eliminate wastewater odors, which also removed biochemical oxygen demand (BOD) at a high rate. BioHavens have now been utilized to reduce odors, remove nutrients and metals, provide wildlife and fish habitat, and improve aesthetics.

Overview

An existing anaerobic pond was receiving municipal wastewater from the City of Marton, plus landfill leachate and other industrial waste streams from a nearby malting company; the odor from this mixture created a major problem. The Rangitikei District Council attempted to mitigate the odor by operating six 10-kW aerators 24/7. In addition to high costs, the community still had to contend with extremely unpleasant odors when the aerators frequently required maintenance.

BioHaven serving as wastewater lagoon blanket

FII licensee Waterclean Technologies offered to provide a guaranteed solution. After thoroughly surveying the pond to accurately map the concrete wave band around the edge of the pond, Waterclean designed and manufactured a BioHaven system to fit tightly over the pond like a blanket, to "seal in" the odor. The FTW was planted with native sedge, *Carex virgata*, a resilient species to cope with the harsh environment.

Installation Data

Location	Marton, New Zealand
Parameters Studied	Biochemical Oxygen Demand (BOD)
Environment	Lagoon
FTW Size	2,770 m^2 (29,800 ft^2)
Water Source	Municipal wastewater, landfill leachate and industrial wastewater
Installation Date	March 2010
Flow Rate	3,000 m^3/day (550 gpm)
Hydraulic Retention Time	3 – 3.5 days

Results

The "floating blanket" has been an outstanding success, reducing BOD from about 450 mg/L to 85 mg/L, an 81% decrease. This removal rate of 395 g BOD/m^2/day has greatly improved effluent quality. Waterclean believes that all wastewater treatment is occurring beneath the island, as the root zones do not penetrate far into the wastewater. The water temperature is a constant 27^{o}C.

Most importantly, all objectionable odors have been eliminated from the facility and shutting off the aerators has saved approximately $150,000/yr in energy costs.

Special Features

The project is a leading-edge application, as it was the first in the world to use FTWs in this manner. The Rangitikei Council wanted a no-risk situation, which required the Waterclean solution to be successful. The wastewater blanket concept was initially presented to scientists, who agreed that it would work in principle.

Conclusion

The Marton wastewater blanket has essentially formed a low-rate anaerobic digestor. It has provided a unique solution by eliminating odor, improving effluent quality (primarily BOD) and reducing operating costs. As of September 2013 (after more than three years in operation), the system is still performing optimally.