Headworks Bio™ Inc.

CleanSea®

Case Study

British Columbia Ferry Services, Inc. British Columbia, Canada

Commissioned in 2003, BC ferries' Motor Vessel Mayne Queen continues to operate a Headworks Bio CleanSea® Oxidation system designed for the challenging application of shipboard wastewater treatment. Well maintained and operated, the vessel consistently produces high quality effluent for discharge to the sensitive and protected waters of British Columbia's Southern Gulf Islands. Assembled on a skid and delivered to the ship for commissioning, the compact build of the CleanSea components handle high volumes (up to 4 m^3/d) aboard this busy route without taking up limited void space.

Black water is passed through a macerator pump into an equalization (EQ) tank, making the loading even and consistent. The grinder also greatly increases the surface area exposed to treatment, improving the degree of processing.

The volume in the tank is monitored with an ultrasonic level switch that relays to the PLC in another void space containing the process tanks. A variable speed drive adjusts the progressive cavity feed pump according tot the tank level.

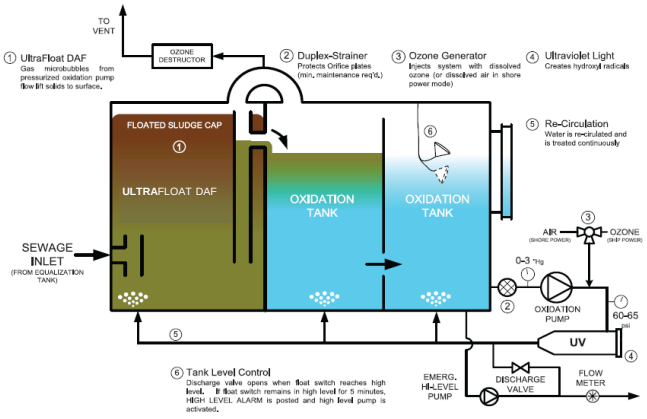
Upon entering the process tanks, solids separation is performed by Dissolved Air Floatation (DAF). Suspended solids, organics and immiscibles adsorb to micro bubbles injected by diffusers. Inorganics settle tot the tank bottoms and are pumped out periodically with the solids atop the water column. Continuous reduction of mass occurs by residual ozonation in the tank head space, mitigating solids handling costs.

Process water gravitates forward, while more dissolved gas is injected under pressure and re-circulated to increase retention time and the degree of processing.

Advanced oxidation is achieved with ultraviolet light, generated in a wave length that photo-dissociates oxygen bearing molecules to create a highly reactive molecular species, the hydroxyl radical. Although UV is used for photolysis, to the degree that there is transmittance, there is also disinfection.

In a small space and short time, these systems are able to exceed stringent discharge requirements in the range of 50 mg/L BOD, 50 mg/L TSS, 14 MPN/100 ml fecal coli form.

Optimally, by using fresh water for cooling and make-up volume, the system avoids pitting and crevice corrosion caused by salt water chlorides. This, combined with a simple maintenance regime, should enable the Mayne Queen to sail on for many years to come, protecting British Columbia's environmentally sensitive coastal waters.



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