

Startup of a Moving Bed Biofilm Reactor

National parks attract millions of visitors each year. Increased seasonal traffic at these locations can overload wastewater treatment infrastructure, leading to treatment inefficiency and, eventually, the need for structural replacement. When starting up a new plant, seeding with healthy biomass is vital for establishing long-term treatment efficiency. The following case study outlines the startup of a moving bed biofilm reactor (MBBR) using ProBiotic Scrubber® II (PBII) and small amounts of activated sludge.



Figure 1. Fully installed and operating Kubota MBR system.
<https://www.kubota.com/products/solutions/>

A national park in Wyoming was installing a new 0.06 MGD Kubota-manufactured MBBR system (Figure 1) to replace its old, overloaded conventional activated sludge (CAS) plant. The quantity of wastewater processed by the CAS plant continually increased during each tourist season, from May to October. The high flows generated by the transient population at the park frequently overwhelmed the facility. Specifically, during the summer, the mechanical plant received flows that far exceeded the small system's treatment capacity. Because the volume of influent delivered to the CAS facility was beyond design specifications, effluent quality was declining, and facility operators were concerned about meeting NPDES permit limits.

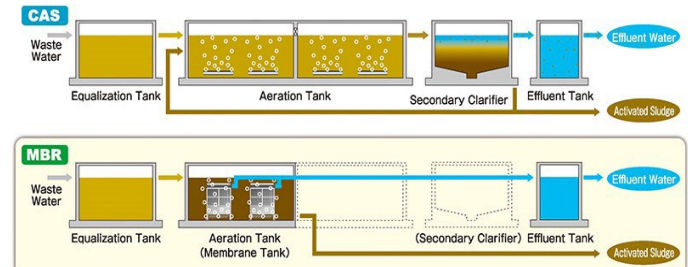


Figure 2. System diagrams comparing the treatment components of CAS and MBR systems. The Kubota MBR does not require a secondary clarifier. MBR systems have greater treatment capacities with much smaller footprints. <https://www.kubota.com/products/solutions/>

Plant management decided that the infrastructure needed to be replaced with a system that could handle higher flows (Figure 2). Designing and building the new MBBR facility would take a minimum of two years. During that time, the existing plant was required to meet permit limits. The Utilities Supervisor at the park contacted BioLynceus® to design a bioaugmentation plan to improve the biological treatment efficiency of the existing system. The park used PBII at the facility while the new MBBR was being constructed. PBII provided the biology needed to process high flows and keep the plant in compliance with its permit.

When the time came to start up the MBBR facility, plant management decided to use a combination of PBII and activated sludge to seed the reactor. Maintaining high treatment efficiency was essential when starting up the new plant, so they opted to add PBII to the system from the beginning. By adding the BioLynceus® product, the plant reduced its sludge-hauling costs because less activated sludge was needed to start the reactor. From startup, the MBBR system properly processed influent wastewater. Seeding the reactor with PBII was financially beneficial for the park and helped establish a biomass that promoted efficient treatment in the new system.

BioLynceus® ProBiotic Scrubber® II provides an effective biomass for MBR startup.

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