UPGRADE TO CONFECTIONERY MANUFACTURER'S WASTEWATER TREATMENT PLANT ELIMINATES SURCHARGES

CLIENT

A confectionery manufacturing plant located in Pennsylvania, USA.

Technology
ADI® Anaerobic Membrane Bioreactor (AnMBR)

Sector
Food & Beverage

Location
Pennsylvania, USA

CHALLENGE

An ADI Systems client was equipped with an anaerobic wastewater treatment system that consisted of an equalization tank, three hybrid anaerobic reactors, a degas tower, and a clarifier. This system was not meeting the client's needs, as it was only removing approximately 60% of the BOD. Sludge settleability and odor issues in the open clarifier also presented a problem.

The plant produces a high-strength waste co-product which could not be added to the plant's existing wastewater treatment system. This method of processing the COD load would not allow the plant to meet discharge limits and required the waste co-product to be hauled off-site.

With an increase in production, a requirement for additional hydraulic capacity, and stricter discharge limits coming into effect, the plant's existing wastewater treatment system required an upgrade.

SOLUTION

ADI Systems modified the plant's existing treatment system to an ADI® anaerobic membrane bioreactor (AnMBR) by converting one of the hybrid reactors to a continuous stirred-tank reactor (CSTR) and adding two membrane tanks.

Upgrading the plant's system to an AnMBR provides effective treatment for the process wastewater and high-strength co-product waste, which no longer needs to be hauled off-site.

RESULTS

The new AnMBR eliminated the need for two of the existing hybrid reactors, the degas tower, and the clarifier, thereby simplifying the overall treatment process at the plant. The upgraded system can treat more flow with significantly higher organic load and has eliminated sludge settleability and odor concerns associated with an open clarifier.

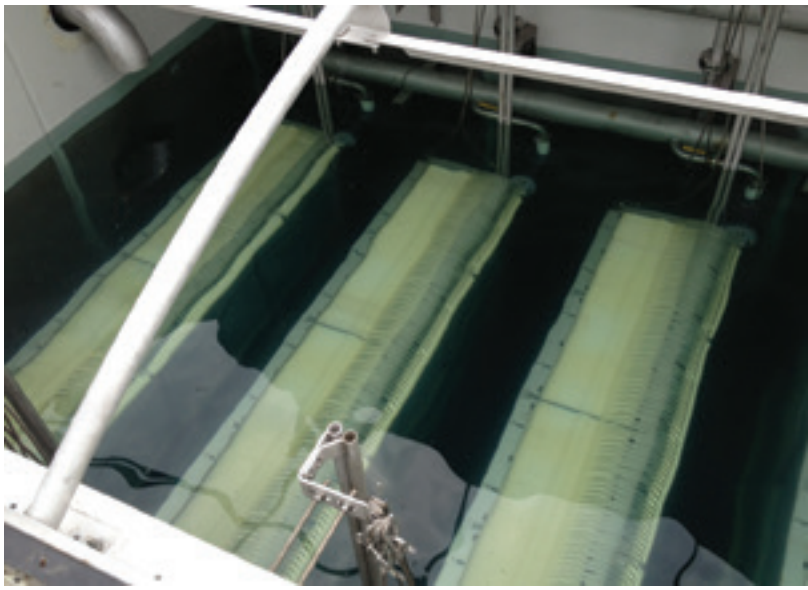
The upgraded system utilizes the remaining 130,000 gal (500 m^3) hybrid reactor (converted to a CSTR) and two membrane tanks (each with a volume of 43,000 gal [160 m^3]) fitted with submerged membrane units.

The AnMBR system is operated at mesophilic conditions; temperature is controlled through existing spiral heat exchangers with heat supplied by a biogas-fueled boiler. The continuously recycled biomass between the CSTR and AnMBR tanks provides a means of maintaining the system temperature at 95°F (35°C). The pH in the AnMBR is regulated at 7.1 ± 0.1 to maintain proper conditions for the anaerobic sludge.

The AnMBR consistently produces a significantly better-quality effluent, which is discharged to the local publicly-owned treatment works (POTW). The client is able to reliably meet the effluent discharge limits set by the POTW, thereby eliminating surcharges.

OPERATING RESULTS:

PARAMETER	INFLUENT	EFFLUENT	REMOVAL
Flow (gpd; m^3/d)	41,000; 155	41,000; 155	–
COD (mg/l)	12,000	350	>97%
BOD (mg/l)	4,400	30	>97%
TSS (mg/l)	1,200	nil	-100%



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