ENVIROGEN TECHNOLOGIES

A Lifecycle Performance Company

A member of The Amplio Group

Case Study

Confidential Client

Challenge

A batch chemical plant that manufactures pharmaceutical intermediates currently discharges its wastewater to the municipal sewer system after pH adjustment and liquid-phase activated carbon adsorption. The treatment system needed to be upgraded to meet new EPA limits for pharmaceutical manufacturing. In addition, the plant expected to reduce sewer surcharges by reducing BOD_5, TSS and TKN levels.

Solution

Envirogen Technologies, Inc. (Envirogen) conducted a treatability program to evaluate the robustness of the membrane biological reactor (MBR) system to fluctuations in wastewater composition. Actual plant wastewater was used for a portion of the test program, while synthetic wastewater was used for the balance. The compounds of interest, in order of the relative concentration, were methanol, tetrahydrofuran, acetone, toluene, methylene chloride, chlorobenzene, isopropanol and isopropyl acetate. Both feed waters were enriched with a representative mixture of the eight compounds to achieve a TOC concentration in excess of 1,000 mg/L, which was the design basis for the full-scale facility. The fluctuations included methanol and acetone spikes, THF and toluene deletions with add-backs, cold weather operation, short-duration (one week) cessation of feed, and overload conditions. The program lasted for 112 days with two lab-pilot MBR systems operating in parallel. The MBR feed flow and composition averaged greater than the design criteria for the entire test program.

The engineering significance of this test work was that the design basis previously used to size equipment and components was sufficient to withstand expected perturbations in the wastewater composition while producing an effluent of suitable quality to meet discharge limitations.

Envirogen designed, fabricated, installed and started-up the full-scale system. The system is operating at greater than the design strength feed of segregated wastewaters from various plant operations.

The client has determined that the system has paid for itself in the first year with the resulting operation and maintenance savings.