

Eastman Chemical Chooses Two-Stage Anaerobic Hybrid to Pretreat Ethylene Glycol Wastewater in Malaysia

In November 1998, Eastman Chemical Company of Kingsport, Tennessee, invited ADI Systems Inc. to submit a proposal for a high-rate anaerobic treatment system to pretreat several wastewater streams at its chemical plant in Kuantan, Malaysia.

The new anaerobic system would be part of an expansion of the existing wastewater treatment plant and would replace a problematic and underachieving anaerobic reactor currently on site.

ADI's bid was accepted, and the project was awarded in December 1998. The project was on a fast-track schedule; construction of the anaerobic system began in April 1999, and system start-up took place in August 1999.

ADISystems Inc. supplied a technology package for this project, including a detailed process design, construction inspection, and start-up and follow-up services. The technology selected was a hybrid of two popular anaerobic technologies--the upflow anaerobic sludge bed (UASB) and upflow anaerobic filter processes. ADI has employed this technology in nearly a dozen installations for the treatment of complex chemical wastewaters similar to Eastman Chemical's.

The raw wastewater to be treated consists primarily of ethylene glycol, with trace amounts of several other complex organic chemicals. The wastewater is highly variable in both flow and composition, with design flows ranging from 27-41 m³/d and design COD concentrations ranging from 6450-7250 mg/l.

Preliminary treatment includes mixing and equalization of the various wastewater streams, followed by pH adjustment and fine screening prior



to treatment in the anaerobic reactors. The two anaerobic hybrid reactors are each 33 m³ in volume. The reactors are designed to operate in a lead-lag series mode of operation in which the lead and lag reactor designations are periodically switched. This process has proven to give superior performance for the treatment of complex wastewaters.

The ADI-Hybrid reactors remove the majority of the biodegradable organics in the wastewater and converts them into biogas. The biogas is collected and disposed of. The pretreated wastewater discharges to an existing activated sludge system for final polishing prior to final discharge to the ocean.

The new anaerobic system helps ensure that Eastman Chemical meets environmental regulations at the Malaysian operation; it will provide efficient, reliable treatment of this difficult-to-treat wastewater.

ADI Systems Inc.