

## ADM Decatur



**Application:** Tertiary treatment of grain processing wastewater for reuse

**Capacity:** 5 MGD (18,925 m<sup>3</sup>/d) Future 6 MGD (22,710 m<sup>3</sup>/d)

**Location:** Decatur, IL, United States

**Commissioned:** March 2004

### Challenge

The Archer Daniels Midland (ADM) Co. Inc. is one of the world's largest processors of oilseeds, soybeans, corn, wheat and cocoa. The Decatur plant processes grains, and produces a variety of products, including corn syrup, ethanol, vegetable oils, dextrose, fructose, gluten, soy flour, soy protein concentrate, soy and corn meal. The wastewater stream generated is high in organic content and nutrients.

The conventional wastewater treatment facility consists of anaerobic and aerobic treatment, followed by dissolved air flotation and settling. A portion of the final effluent is reused as make-up water in the facility's cooling towers and the rest is sent to sewer. The conventional system required large amounts of chemicals for coagulation/flocculation in order to settle out solids and additional chemical

is required to remove phosphorous, making it costly to run their cooling towers.

### The Solution

ADM selected a ZeeWeed\* immersed membrane filtration system from GE Water & Process Technologies, to treat the secondary effluent from the conventional wastewater treatment facility. With a nominal pore size of 0.04µm, ZeeWeed reinforced hollow-fiber membranes act as a physical barrier to suspended solids and colloidal material, resulting in a high quality effluent at all times.

Whereas clarifiers require large amounts of polymers and coagulants to settle solids, ZeeWeed membranes filter out solids and bacteria in wastewater that need only be slightly larger than the pore size of the membrane to be effectively removed without the addition of chemicals. With this high quality effluent, ADM is able to save more than US\$1 million per year in cooling tower chemicals and according to Brad Crookshank, the plant operator, "the cooling towers have never run better".

### Process Overview

The ZeeWeed tertiary system is comprised of six trains for a total flow of 5 MGD (18,925 m<sup>3</sup>/d) with additional space to increase the treatment capacity to 6 MGD (22,710 m<sup>3</sup>/d).

Wastewater from the secondary clarifier is sent to a pond and alum is added to remove phosphorous in the wastewater before being pumped to the ZeeWeed process tanks. Filtration is achieved by a variable-speed permeate pump, which generates a low pressure vacuum drawing treated water to the inside of the membranes.

Part of the effluent from the ZeeWeed tertiary system is reused as cooling tower makeup water and the rest is sent to sewer.

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