Dynatec Provides Reuse Water for Cereals Plant

Dynatec Systems, Inc. has installed a water reuse system in a major cereals plant in Georgia.

The complete treatment system, consisting of a membrane bioreactor (MBR), followed by reverse osmosis (RO), provides a net savings to the plant of more than $3,000 per day in water and sewer charges after deduction of the plant operating costs. The water is reused for cleaning, in scrubbers and in boilers.

Previously, the facility discharged all of the wastewater to a municipal treatment plant at a rate of up to 0.5 mgd, and paid both volume and load charges.

Quality Criteria
Since the plant produces a food product, ultimate water quality is vital. The two-stage membrane system (MBR + RO) and final sterilization with ultraviolet (UV) treatment provides the quality assurance that plant management requires. In addition, the membranes used in the MBR system are external to the aeration basin, and are tubular. This type of membrane is much less susceptible to failure than the immersed type.

System Design
After a review of the available treatment options, the owners of the facility settled on the Dynatec HiRate™ Bioreactor option. This process combines aerated biological treatment with an out-of-basin ultrafiltration (UF) system. In combination with reverse osmosis treatment, Dynatec was able to provide the client with the necessary assurances that the water quality would not be compromised, and that the water would be suitable for process purposes, such as boiler feed water.

Dynatec’s design consisted of the following components:

- Internally-fed rotary screen
- 500,000 gallon above-ground stainless steel equalization tank with jet aeration and duplex PD blowers
- 500,000 gallon above-ground stainless steel aerated biological reactor with jet aeration and triplex PD blowers
- Four membrane skids with a common automated CIP (clean-in-place) system, one skid operates in standby mode
- Reverse Osmosis system
- Final UV (ultraviolet) sterilization
- Sludge dewatering decanter centrifuge
- Completely integrated control system managing all system functions
System Advantages:
- The system provides many advantages for the operators and owners.
- Redundant membrane skids for ease of operation and cleaning.
- Simple automated cleaning operations with membranes in place.
- High mixed liquor concentration ensures lowest possible sludge production, and requires smallest possible footprint.
- Simple, low maintenance system.
- Long-lasting tubular membranes with 0.03 μm membrane, ensuring removal of bacteria and viruses.

Results:
The system has produced high quality water for reuse. Consistently, the water quality from the MBR has been as follows:

<table>
<thead>
<tr>
<th>Analytic</th>
<th>Units</th>
<th>Influent</th>
<th>MBR Effluent</th>
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<tbody>
<tr>
<td>BOD5</td>
<td>mg/L</td>
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<td>&lt;5</td>
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<tr>
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<td>mg/L</td>
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<tr>
<td>TSS</td>
<td>mg/L</td>
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State Award
In 2008, the facility received an award from the State of Georgia Association of Water Professionals presented an award to the facility for Outstanding Operation of a facility in the category of Water Conservation.

Project Conclusion:
The project was completed on time and within budget, and has exceeded the estimates that were initially made for cost savings. The Dynatec system has proved to be reliable and efficient, and has exceeded the customer’s requirements, based on the initial projected performance.