UNISOL
Membrane Technology

MYTEX
CASE STUDY

Successful Technology Transition: Major North American Waste Water Treatment Plant Adopts Modern MBR Technology

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Initial Situation

A major wastewater treatment plant in North America faced the challenge of comprehensively upgrading its existing treatment system. The primary objective was to meet increasingly stringent environmental regulations and thereby protect the environment. As part of this upgrade, the plant significantly increased its hydraulic capacity to accommodate higher inflow volumes during heavy rainfall events. This also helped reduce the discharge of combined sewage and stormwater at the stormwater overflow.

The transition from conventional treatment technology to a membrane bioreactor (MBR) system began promisingly in mid-2024. However, with only half the plant initially converted to an MBR, the colder season presented unforeseen difficulties: lower process temperatures during winter and spring led to overloading of the biological treatment stage. Inflow concentrations exceeded design capacities by up to 135% for total suspended solids (TSS) and 48% for carbonaceous biochemical oxygen demand (CBOD). The limitation imposed by the existing sludge retention time (SRT) became increasingly apparent. The system has now been fully upgraded and is reliably meeting treatment goals.

Solution Approach: MBR Technology

The decision was made in favour of M|MBR systems and for MYTEX MBR units, known for their outstanding effluent quality, compact design, and high resilience to peak load conditions.

Key system features include:

- 4 process trains, 8 membrane basins, 144 MYTEX H5L6 membrane units with a total membrane area of 114,048 m^2
- Complete treatment of 99.9% of the plant's influent
- Compact, modular tank layout (5 meters deep)
- Preassembled MYTEX modules from Germany for time-efficient installation
- On-site commissioning support by experienced specialists

Despite having no prior experience with MBR technologies, the plant operator was able to successfully and rapidly transition into stable operation, thanks to targeted training and technical support.

Results & Evaluation

Following successful commissioning in summer 2024, the new system demonstrated strong performance - even under challenging conditions. Membrane inspections revealed no significant fouling or damage, only an expected accumulation of operational residues.

The MYTEX membranes impressed with their mechanical durability, and the operator especially praised the system's high operational stability and excellent effluent quality.

Economic and Technical Benefits

- ✓ $6 million in construction cost savings
- ✓ Outstanding effluent quality:
  - TSS and BOD: non-detectable
  - NH_3: < 1 mg/L
  - Fecal coliforms: < 1 CFU/100 mL
- ✓ Initially elevated energy and chemical consumption is expected to decrease through ongoing optimization
- ✓ High employee motivation was a key success factor
- ✓ Feedback remained consistently positive despite limited prior experience with MBR technology
- ✓ Additional performance data will be published once full plant operations are underway

Project Partner

- **Clairton** – MBR System Supplier and Integrator
- **M | MBR Systems**

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