



Ontario's First Flexible Submerged Membrane Plant

APPLICATION: Municipal Wastewater

CAPACITY: 183 to 917 GPM
(1,000 - 5,000 m³/d)

LOCATION: Town of Cobden, ON, Canada

COMMISSIONED: Fall 2021

TECHNOLOGY: flexMBR™

CHALLENGE

The Township of Whitewater Region was looking to upgrade its treatment facility at the Town of Cobden due to capacity limitations and stringent effluent criteria being implemented. A membrane bioreactor (MBR) was chosen as the preferred technology given the site constraints and its proven performance. The upgrades consisted of the construction of two new MBR treatment trains to run in parallel with the existing extended aeration system. As part of the project specifications, to gain protection for future membrane replacement pricing and to take advantage of technology evolution, the membrane system supplier was to provide a design that allowed for the interchangeability of the modules with at least three other membrane vendors.

DESIGN SOLUTION

The facility includes typical pre-treatment operations for MBRs: equalization tanks, fine screening, and biological reactors. The biological treatment system was designed to handle an average daily flow rate of 183 GPM (1,000 m³/d) and a hydraulic capacity up to 917 GPM (5,000 m³/d).

The headworks was upgraded to divert flow from the existing grit chamber to the MBR treatment trains while keeping the existing extended aeration system running. The raw wastewater is conveyed to an equalization tank to suppress the flow variation of the facility. From the flow equalization tank, the wastewater is pumped up to the rotary drum fine screens and transferred to the two biological and membrane trains comprised of above grade concrete tanks. Chemical conditioning in the form of ferric chloride was included to remove phosphorus. A centrifuge system was also included to dewater the waste activated sludge.

flexMBR™ SYSTEM

The flexMBR™ system includes a universal platform support system designed to fit most MBR modules covering an acceptable membrane surface area range. The flexible system also includes a robust control system that accommodates a predetermined range of membrane manufacturer operating parameters, including air scour rates, permeation cycles, cleaning frequency, and other process control parameters such as sludge wasting to control mixed liquor suspended solids (MLSS).



Parameter	Influent (mg/L)	Effluent Criteria (mg/L)	Projected Effluent (mg/L)
Biochemical oxygen demand (BOD)	250	< 10	< 5
Total suspended solids (TSS)	250	< 10	< 1
Total Kjeldahl Nitrogen (TKN)	35	N/A	N/A
Ammonia	25	< 3	< 1
Total phosphorus (TP)	10	< 0.1	< 0.1
pH	6 - 8	6 - 8	6 - 8
Temperature	7-40 °C	N/A	N/A