

CASE STUDY MICRODYN BIO-CEL® MBR

Konacik Municipal Wastewater Treatment Plant



MICRODYN
NADIR

ADVANCED SEPARATION TECHNOLOGIES



Objective

A municipal Wastewater Treatment Plant (WWTP) in the Konacik district of Bodrum, Turkey sought to upgrade their existing 1500 m³/d (0.4 MGD) Membrane Bioreactor (MBR) plant, where the effluent is used for irrigation. MICRODYN BIO-CEL® MBR was selected for the project and 12 BIO-CEL 400 modules were installed in two separate filtration tanks.

Table 1. Plant BIO-CEL MBR Operational Parameters

Parameter	Value
Date Commissioned	October 2013
Number of BIO-CEL 400 Modules	12
Total Membrane Area	4800 m ² (51,667 ft ²)
Daily Average Flow	1500 m ³ /d (0.4 MGD)
Peak Flow	87.5 m ³ /h (385 gpm)
Mixed Liquor Suspended Solids (MLSS)	8-10 g/L
Solids Retention Time (SRT)	20 Days
Average Flux	13 LMH (7.6 GFD)
Average Transmembrane Pressure (TMP)	60 mbar (0.87 psi)
Average Energy Consumption (MBR)	0.4-0.5 kWh/m ³
pH	7 - 7.5
Minimum Temperature	15°C (59°F)

Project Goal

Provide membrane units capable of producing quality effluent for irrigation.

Feed

Municipal wastewater

Membranes

12 MICRODYN BIO-CEL®
400 Modules

MBR Pollutant Removal

- BOD: 98.3%
- COD: 93.4%
- TKN: 87.5%
- TP: 87.5%
- TSS: 95.8%

Results

Table 2. MICRODYN BIO-CEL MBR performance

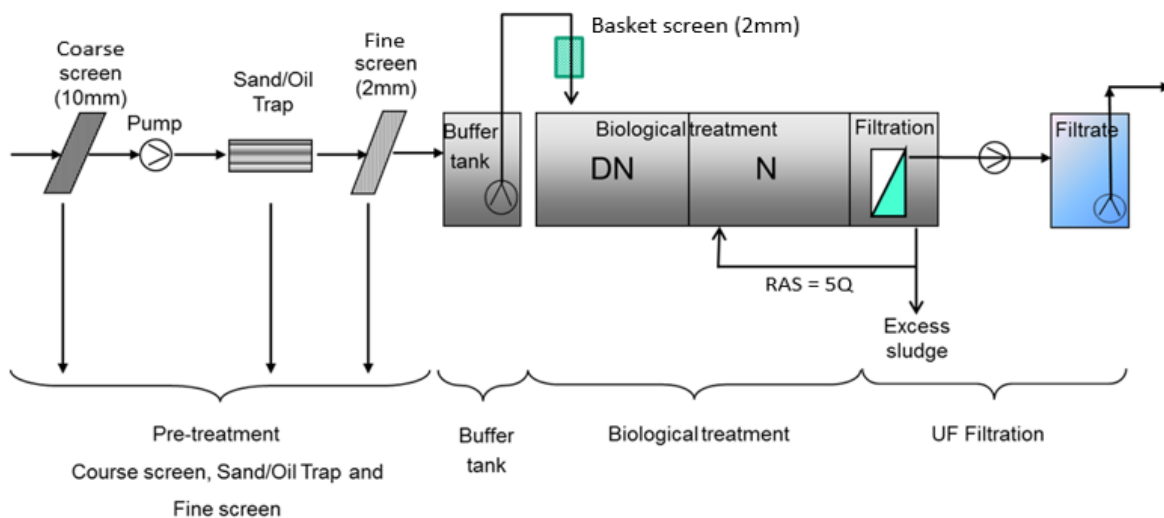
	BOD (mg/L)	COD (mg/L)	TKN (mg/L)	TP (mg/L)	TSS (mg/L)	Ammonia (mg/L)
Raw Influent	290	380	80	8	120	-
BIO-CEL MBR Effluent	<5	<25	<10	<1	<5	<1

Materials & Methods

12 BIO-CEL® 400 membrane modules were installed at the plant. Unit operations for the WWTP are as follows:

- Equalization tank
- Coarse screen (10mm)
- Fine screen (2mm)
- Basket screen (2mm)
- Denitrification tank
- Nitrification tank

Figure 1: Configuration of biological and MBR process in Konacik.



Conclusion

Since the project's completion, plant performance has been stable and is reliably producing high quality effluent suitable for irrigation. The BIO-CEL 400 modules have demonstrated positive performance in terms of lower energy demand due to crossflow aeration via fine air bubble diffusers, easier maintenance due to BIO-CEL's membrane laminate that combines the advantages of flat sheet and hollow fiber membranes allowing for backwash capability and increased durability, and a decreased risk of down time for the plant in case of membrane damage due to BIO-CEL's self-healing effect.