

***Package and Containerized Effluent Treatment Plant  
 based on MBR Technology 100 m<sup>3</sup>/day and 65 m<sup>3</sup>/day RO  
 Plant for Al Ain Juice National Refreshment Factory, U.A.E***



**DAF System with Dosing Pumps**



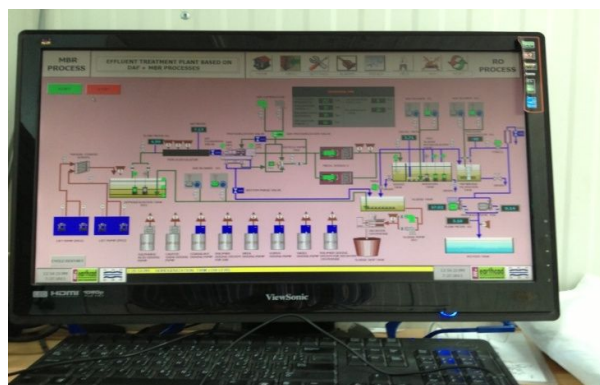
**Fine Screen with Grit Removal System**



**MBR Tank with Degassing Vessel**



**RO Plant Filtration System**



**STP SCADA System with Desktop Computer**



**Aeration Positive Displacement Blowers**

## Project Name

The Containerized Effluent Treatment Plant (ETP) of 100 m<sup>3</sup>/Day based on MBR Technology and 65 m<sup>3</sup>/day RO Plant is located at the Al Ain Juice National Refreshment Factory in AL Ain and caters to the wastewater treatment requirements of the Factory.

## Client

Al Ain Juice National Refreshment Factory in Al Ain, U.A.E

## Project Joint Venture

Celar Water Equipment Co., LLC, Sharjah, UAE  
EarthCAD Environment FZ-LLC, RAK, UAE

## Scope of Services

**Scope of Work under this project includes:**

- Design, Engineering, Supply of Package Sewage Treatment Plant of 100 m<sup>3</sup>/Day based on MBR Technology and 65 m<sup>3</sup>/day RO Plant including all Electrical & Mechanical and Civil Works, for all equipments and storage tanks
- Construction of Civil Items, Installation, Testing, Start-up and Commissioning of ETP
- Operation and Maintenance of STP including Supply of Consumables and Chemicals for 1 years.

## Treatment Technology

State of the art, revolutionary, economical and sustainable MBR technology uses Ultra-filtration Membrane for filtration.

The MBR process is a suspended growth activated sludge process system that utilizes microporous membranes for solid/liquid separation in lieu of secondary clarifiers

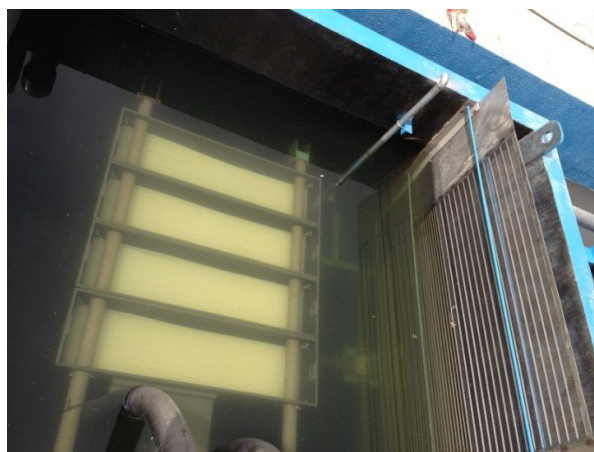
The typical arrangement of MBR System includes submerged membranes in the aerated portion of the bioreactor, an anoxic zone and internal mixed liquor recycle.

## Design Basis

The Package MBR ETP + RO has been designed taking into consideration the wastewater flow (100 m<sup>3</sup>/day) and characteristics as given below.

### Inlet Wastewater Characteristics

Parameters	Designed (Maximum)
BOD	4000 mg/L
COD (Total)	8000 mg/L
TSS	250 mg/L
Temperature	20 °C- 35 °C
pH	7-8



Submerged MBR Module with MCP

## Design and Process Flow Scheme

The Design and Process Flow Scheme of the 100 m<sup>3</sup> per day MBR ETP + 65 m<sup>3</sup>/day RO Plant is as follows:

- Effluent Li ft Station 1 with Cutter Impeller Pumps
- Effluent Li ft Station 2 with Cutter Impeller Pumps
- Screen Chamber with Manual Screen (10 mm)
- Balancing/Equalization Tank (RCC)
- Equalization/Sludge Tank Positive Displacement Blowers
- Raw Sewage Submersible Pumps to Pump Sewage from Balancing Tank to Aeration Tank
- Electromagnetic Flow Meter
- pH Correction System

- Dissolved Air Floatation Unit with compressor and recirculation pumps
- Coagulant and Polymer Dosing System for DAF
- MBR Anoxic Tank with Submersible Mixer
- MBR Aeration/Nitrification Tank with Disk Type Fine Bubble Diffuser
- Aeration Tank Positive Displacement Blowers
- Submersible Sludge Recirculation/Waste Pumps with Vortex Impeller
- Sludge Motorized Valve
- MBR Tank with 1 BC 400 Ultrafiltration Module of flux rate 10.8 LMH
- Membrane Cleaning System MCP with SS Sieve, PP Granules and Tube Type Fine Bubble Diffuser
- Rotary Lobe type Permeate Removal/Backwash Pump with reverse rotation
- Sludge Holding Tank (GRP)
- Coarse Bubble Diffusers in Sludge Tank
- Progressive Cavitate Sludge Pumps
- Sludge Dewatering Centrifuge with Polymer Dosing System
- Permeate Tank in GRP
- Hypochlorite based Chlorination System
- RO Feed Tank in GRP
- 65 m3/day RO Plant
- Reject Water Tank in GRP
- Interconnecting Piping, Valves, Fittings
- Electrical Cables and accessories
- Electrical Control Panel with Desktop Based SCADA SYSTEM in 20 feet container
- Civil Works for Placement of Equipments and Tanks



ETP Inlet, DAF Outlet and MBR Outlet Samples

## STP Performance and Treatment Efficiencies

The Plant was started in April 2013 and the performance data is given below;

### Results of Lab Analysis (16th<sup>th</sup> April 2013)

Parameters	Inlet of STP	Outlet of STP
pH at 25 <sup>o</sup> Temp.	6.9	7.2
Total Suspended Solids (TSS)	1320	<5
Biochemical Oxygen Demand	1040	7
Chemical Oxygen Demand	4270	13



Dried Sludge from Decanter Centrifuge



Rotary Lobe Type Permeate/Backwash Pump