

CASE STUDY

Aysir Tourism Resort

Industrial SWRO Systems Turkey



Introduction

In 2004, Pure Aqua successfully supplied an Industrial Seawater Reverse Osmosis (SWRO) system for Aysir Tourism Resort in Turkey consisting of two units with a capacity of 400 m³/day product water.

Systems & Process

Feed water to the system is from beach-well with raw water TDS of about 40,000 PPM. The system design was based on high rejection TFC spiral wound membranes with an energy recovery turbine. The Sea Water Reverse Osmosis systems were selected from our SWI Series, model number SW-53K-3480. Each produces 200 m³/day of drinking water with TDS less than 240 mg/L. The overall plant process is briefly described below.

- Pre-treatment of raw water includes the following:
 - Chlorination to prevent bacterial growth in piping
 - Acid injection to prevent calcium precipitation
 - Filtration using conventional multi-media filters to reduce suspended solids (SS) to 10 microns
 - De-chlorination by addition of sodium bisulfite to remove free chlorine in the feed water
- Seawater Reverse Osmosis (SWRO) units consist of:
 - Feed and backwash pumps
 - 5-micron cartridge filters to reduce feed water Silt Density Index (SDI) and to limit the SS to 5-micron size
 - SWRO membranes feed high pressure pumps with Energy Recovery Turbine (ERT) to recover up to 35% of the energy consumption
 - TFC spiral wound membranes to reduce the dissolved solids from 40,000 mg/L to less than 250 mg/L
- SWRO flushing and cleaning system to maintain the membrane performance
- Touch screen Programmable Logic Control (PLC) based control panel Energy Recovery Turbine and variable frequency drive

Performance

- From a feed TDS of about 40,000 mg/L at a temperature range of 19°C and 27°C, the desalination plant produces 2 x 200 m³/day of drinking water with TDS less than 300mg/L.
- Since the time of its start-up in 2004, the plant has been running smoothly with minimal trouble-shooting.

Plant Design Summary

Location:	Turkey
Project:	Aysir Tourism Resort
Application:	Potable & General Use
Total Plant Design Capacity:	2 Trains, 200 m ³ /Day
Product Flow Rate per Train:	200 m ³ /Day
Start Up Date:	2004
Feed Water Source:	Mediterranean Beach Wells
Membranes:	TFC 8" High Rejection
Energy Recovery:	Turbo charges
Chemical Treatments:	Pre- & Post Chlorination Acid Injection Antiscalant Injection Caustic Injection
Plant Product TDS:	General Use = less than 500 mg/L Potable Use = less than 300 mg/L
Typical Operating Conditions:	
▪ TDS feed:	40,000 mg/L maximum
▪ Maximum Design Pressure:	1000 psi
▪ Overall System Recovery:	40%
▪ Feed SDI:	Less than 3