CASE STUDY

A Sustainable Wastewater Treatment and Reuse Solution for Commercial Properties

MENOGIA IMMIGRATION CENTER, CYPRUS

Problem On the island nation of Cyprus, the Water Development Department needed a wastewater treatment system for an immigration processing center that was in the planning stages. For security reasons, the system would be installed below grade. In addition, both the cost and the footprint of the system had to be minimized.

Solution The department chose an AdvanTex® Wastewater Treatment System because of its low cost of operation and maintenance (O&M). Six AdvanTex AX100s were installed below grade, inside a concrete structure. In addition, a mechanical screening device was installed upstream of the septic tank in order to reduce the overall tankage requirements and project footprint.

AdvanTex® Treatment System Chosen for Overall Low Life-Cycle Costs

Due to its location in the Mediterranean Sea, the Republic of Cyprus is a common stop for immigrants traveling between the Middle East and Europe. In 2011, the Cypriot government was planning a new immigration processing center that could temporarily house up to 600 people. The Water Development Department solicited public bids for the design and construction of the center's wastewater treatment system. All bids had to include a 10-year contract for O&M services.

Because no gravity sewer or central treatment is available in Cyprus, Orenco's AdvanTex Treatment System competed in the bidding process

The AdvanTex® Treatment System is housed in this concrete building located directly above the septic, recirculation, and discharge tanks. Minimizing the footprint of the system was key to the success of this project.

Commercial — Reuse Market

Project Overview

MENOGIA IMMIGRATION CENTER, CYPRUS

Design Parameters
- Immigration processing center for up to 600 temporary residents
- 15,850 gpd (60 m^3/d) average daily flow
- 21,925 gpd (83 m^3/d) peak design flow

Treatment Requirements
- 10 mg/L BOD_5
- 10 mg/L TSS
- 5 CFU/100 mL E. coli

Mean Effluent Quality*
- 6 mg/L BOD_5
- 3 mg/L TSS
- 0 CFU/100 mL E. coli

Start-Up Date
- February 2013

Total Project Cost
- Approximately $615,000 (€430,000), including shipping, installation, and 10-year operation and maintenance contract

Primary Treatment
- 35,665-gallon (135-m^3) septic tank with self-cleaning bar screen at the inlet
- 17,435-gallon (66-m^3) recirculation tank
- 27,475-gallon (104-m^3) discharge tank

** Samples collected and analyzed by a third party between October 7, 2015 and August 30, 2016.*

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Following secondary treatment by six AX100s (pictured here), effluent flows through a sand filter for polishing and a chlorination unit for disinfection. It's then used for landscape irrigation.

against alternative technologies. After considering all bids, the department chose AdvanTex due to its low life-cycle cost, including both up-front capital expenses and ongoing operating expenses. The treatment system would be installed and operated by Dialynas SA, an Orenco distributor based in Greece.

The bid included the cost of six AdvanTex AX100 pods, shipping, installation, and the requisite decade of operation and maintenance services. Dr. Emmanuel Dialynas, a chemical engineer and CEO of the company, said "AdvanTex technology won the bid for us due to its very low cost for O&M."

Arriving in Cyprus by boat, the AdvanTex units were ready for start-up well in advance of the immigration center's completion. For security reasons, the entire treatment system was installed below grade and housed in a concrete building. The treatment units are located directly above the septic, recirculation, and discharge tanks. A mechanical screening device is installed upstream of the tanks, reducing their overall loading and volume requirements. This was key to minimizing the total footprint of the wastewater treatment system.

Following secondary treatment, effluent flows through a sand filter for polishing, followed by a chlorination unit for disinfection. It's then used to water the trees around the immigration center. Additional treated, disinfected effluent is supplied to local farmers for irrigation.

According to Dr. Dialynas, "The client considers this project the most successful of the many small and decentralized systems installed under its supervision."

Data used by Orenco to derive the representations and conclusions contained within this Case Study were current as of January, 2017.

Commercial — Reuse Market

Secondary Treatment
- Six AdvanTex® AX100 pods

Tertiary Treatment
- Sand filter for polishing

Disinfection
- Chlorination

Reuse Application
- Landscape and agricultural irrigation

Equipment Supplier
- Dialynas S.A.

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~ Dr. Emmanuel Dialynas, Dialynas S.A.

For more information about effluent sewers, Orenco Sewers™ and AdvanTex® Treatment Systems, contact Orenco Systems®, Inc.

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