



MEETING THE LIMITS IN EGYPT

Location: Egypt

Owner: Nasr Petroleum Co.

Designer: Genesis Water Technologies Inc.

Contractors: Genesis Water Technologies local consortium

Manufacturers: Vaughn Pumps, Atlas Copco, Primozone

Cost: \$14 million

Size: 3,100 gpm

At a petrochemical refining plant in Egypt, operators sought a means to treat wastewater to improve chemical oxygen demand (COD) and biological oxygen demand (BOD), and to remove free oil, total suspended solids (TSS) and phenols for discharge into the sea.

The massive facility has 3,100 gpm, and the project cost \$14 million to complete. Despite the price tag, the project still had some difficulties and hangups before coming to fruition, as all large projects do. Chief among those issues was maintaining compliance with regulations and meeting discharge limits when the project was complete.

Nick Nicholas, technical sales manager for Genesis Water Technologies, said the design phase was difficult because it revolved around handling the Class I Division I environment.

phenols and recalcitrant organisms, an existing oil separator was optimized for free hydrocarbon and high level TSS removal. Specialized electrocoagulation, micro-bubble technology and advanced oxidation systems were designed and used for phenols removal so the water could be discharged into the Mediterranean Sea (See Table 1, page 17 for discharge specifications).

Nicholas also noted that Capex and Opex costs were a challenge for the project, and that the refinery wished to optimize them.

“Capex and Opex costs were lower than anticipated versus a conventional chemical treatment approach, even with the challenging site requirements including a building enclosure required to house plant components due to the Class I Division I ambient environment outside,” Nicholas said.

“CAPEX AND OPEX COSTS WERE LOWER ... EVEN WITH THE CHALLENGING SITE REQUIREMENTS INCLUDING A BUILDING ENCLOSURE REQUIRED TO HOUSE PLANT COMPONENTS DUE TO THE CLASS I DIVISION I AMBIENT ENVIRONMENT OUTSIDE.” NICK NICHOLAS

“This required the need for a building to house the main electrical and controls, as well as several system components that could not be operated safely in a Class I Division I petrochemical environment,” Nicholas said.

To overcome the challenge of reducing

As of August 2017, the project had finished its design phase. It awaited approvals from the client’s consulting engineer to coordinate with a local construction consortium partner for carrying out civil works. That construction was expected to take several months. **iWWD**

**TABLE 1. REFINERY WASTEWATER DISCHARGE SPECIFICATIONS**

MATERIAL	INLET SPECIFICATION	OUTLET SPECIFICATION
Phenol	combined 10 ppm	0.015 ppm
BOD	270 ppm	<60 ppm
COD	2,700 ppm	<100 ppm
Oil & Grease	20 ppm	15 ppm