

## Wastewater Recycling and Treated Sewage Effluent Plant, Emaar Properties - Downtown Dubai, UAE

### A Case Study



### Key Data

Location	Downtown Dubai, UAE
Plant Type	Wastewater Recycling and Treated Sewage Effluent Plant
Capacity	20,000m <sup>3</sup> /day
Use	Recycle wastewater to reuse as feed water for district cooling purposes
Client	Emaar Properties
End User	Emaar Properties
Contract Type	Design and Build including 5 years Operations and Maintenance

The plant employs a treatment process that makes it possible to recycle and reuse wastewater on-site, thereby efficiently developing a sustainable and readily available water resource serving the feed water requirements of the cooling plants. Prior to feeding the district cooling needs, all Treated Sewage Effluent (TSE) goes through a polishing process that utilizes the Reverse Osmosis (RO) technology.

Compared to otherwise disposing wastewater and incurring higher costs for bringing in costly, fresh/desalinated water, the plant represents a long-term cost saving solution and higher economic and environmental returns to the whole project and the community. To put this into perspective; the cost Emaar now incurs to supply water needed for district cooling is almost a quarter of the cost of desalinating fresh water for the same use.

With a challenging deadline of only six months from design to operation, Metito was able to retrofit a state of the art recycling and polishing plant at the existing district cooling plant DCP3. This is the largest among the three district cooling towers serving the Downtown Dubai district which hosts; residential areas, the Dubai Mall, other retail shops, and the larger community.

Retrofitting was essential as the land value at this particular high end district is one of the most expensive square foots in the UAE, so building the plant within an existing space compared to the traditional solution of building a standalone plant enabled Emaar to save valuable space and significant cost.

This unique project is considered the biggest of its kind in the UAE and possibly in the GCC.

### Introduction

Emaar Properties is one of the world's most valuable and admired real estate development companies. With proven competencies in property development, shopping malls, retail, hospitality and leisure, Emaar shapes new lifestyles with a focus on design excellence, build quality and timely delivery. Their flagship development, Downtown Dubai is the world's most visited lifestyle destination and home to the iconic Burj Khalifa, The Dubai Mall and The Dubai Fountain.

Developing world class projects and fostering strategic partnerships, Emaar strives to preserve the environment through reducing the eco-footprint of its developments. Sharing a commitment to offering sustainable solutions and with 15 years of successful collaboration paving way, Emaar awarded Metito the project to develop a wastewater recycling and treated sewage effluent plant, with the capacity of 20,000m<sup>3</sup>/day. The project aims to secure the feed water needed for district cooling plants DCP1, DCP2 and DCP3 at Mohammed Bin Rashid Boulevard, all of which serve the Downtown Dubai area.







## Scope of Work

The scope of work included complete design, engineering, manufacturing, supply, inspection and testing, installation, commissioning and performance testing of the TSE polishing plant. Metito also supplied the following:

- Ultra-filtration unit consisting of 8 streams producing net filtered water of 26,880m<sup>3</sup>/day. The Ultra-filtration system removes suspended solids and reduces Chemical Oxygen Demand (COD) level before feeding the RO units
- Two Stage RO system with 75% recovery rate. The RO system includes four working trains producing 20,000m<sup>3</sup>/day of TSE polished water to supply three different district cooling plants, located at distinct locations
- Clean-in-place for ultra-filtration and RO unit
- Fully automated plant with Program Logic Controller (PLC)

## Key Benefits

### Environmental Benefits

- Reduction of the carbon footprint in excess of 36.85 tons of CO<sub>2</sub>/day as opposed to using desalinated seawater for the same application
- Turning waste to wealth by recycling wastewater and reusing it efficiently as a readily available water resource rather than disposing of it and desalinating, precious and costly, fresh water

### Financial Benefits

- Saving on the cost of land that would have been required to build a standalone plant
- The cost of securing makeup water to feed the cooling towers is reduced to almost one fourth (1/4) as compared to desalinating fresh water for the same application