

CASE STUDY

Milton Roy Entirely Fits Out The Keppel Marina East Desalination Plant (KMEDP)

“Using Milton Roy, a premium brand in the industry, has proven that product quality and performance are one of our important successes of water production to serve our nation. We are glad to have Milton Roy as our valued partner, consistently providing good support throughout the project lifecycle. We look forward to working together on future projects again.”

Customer

Keppel Seghers Pte Ltd

Location

Keppel Marina East Desalination Plant (KMEDP) at Marina East – Singapore

Application

Scale Control, Polymer, Water Disinfection, Chlorination, Strainer backwash, Shock Chlorination, De-chlorination, Fluoridation, Neutralization, pH adjustment

Products

100% Milton Roy equipment: mRoy, MaxRoy, Primeroyal L, Primeroyal N, Series G pumps, LMI, and Mixers (Total 56 API, 3 non API, 2 solenoids and 6 mixers)

Challenge

To build the Singapore’s first dual-flow mode desalination plant capable of treating sea water or reservoir water to produce 30 million gallons of drinking water per day.

Depending on the changing weather conditions, the facility will switch between water sources as needed.

Project Background

The KMEDP, Singapore’s fourth desalination plant, is a Public Private Partnership (PPP) between Keppel Infrastructure and Singapore’s national water agency (PUB). Built and operated by Keppel Infrastructure Holdings under the Design, Build, Own and Operate (DBOO) model, the plant can produce up to 30 million gallons of fresh drinking water daily. Keppel Infrastructure will supply product water to PUB over a 25-year concession period from 2020 to 2045. The KMEDP is an innovative large-scale desalination facility and Singapore’s first dual-mode desalination plant, which is able to treat both reservoir water and sea water, depending on weather conditions, and with overall land area of approximately 2.8 hectares, it is the most compact desalination plant in the country.

Expertise to Tackle Demanding Water Treatment Challenges

As well as providing ISO-certified facilities, Milton Roy has a long-standing experience in manufacturing highly-efficient pumps, mixers, and systems in compliance with international standards, such as API, NACE, ATEX, to name a few. With a strong working relationship already established between Milton Roy and Keppel Seghers, our highly-competent engineers were keen on taking part in such a high-profile project and provide a sustainable solution for the chemical system design used in desalination plant treatment processes. In addition, our engineers were keenly aware that the solution should include added value to our customer, such as maintaining an optimum footprint design and providing low energy consumption.

Milton Roy’s Helping Hand

With the demands clearly defined, Milton Roy started quickly analyzing the system specifications and put their effort into resolving key issues in the chemical system’s operation.

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Milton Roy's Helping Hand (Cont.)

After a careful analysis of applications, such as scale control, water disinfection, chlorination, fluoridation, and pH adjustment, our team of engineers selected and configured pumps and mixers from our arsenal to fit the requirements perfectly.

To get the chemical system up and running, Milton Roy comprehensively equipped Keppel Marina East Water Treatment Plant with:

- mROY® Series Metering Pumps
- MAXROY® Series Metering Pumps
- PRIMEROYAL® Metering Pumps
- G Series Metering Pumps
- LMI Series Metering Pumps
- Mixers

As our company was the one to fully equip the facility, Milton Roy provided in total 56 API pumps, three non-API pumps, two solenoid pumps, and six mixers, and moreover, brought in a fair amount of local value, such as integrating the pumps onto a module that included additional accessories and a tank.



Overwhelmingly Positive Results

Well-known in the market for its high-quality and reliability, Milton Roy provided a tailor-engineered solution for the chemical side of this high-profile project. Operators at the Singapore plant are highly appreciative of having Milton Roy as a partner. With multiple OEMs able to supply our metering pumps, the availability and ease of maintenance can comfort the customer. Plus, the availability of Milton Roy Authorized Service Center support in the case of an unlikely event, as well as a local support provided by I M Kinetic Asia PTE LTD have brought extra value to the project.

Boosting water supply

Singapore's first large-scale desalination plant capable of treating both seawater and reservoir water has officially opened. It can produce about 30 million gallons of fresh drinking water per day, accounting for up to 7 per cent of the nation's total water needs. Integrated with the surrounding greenery, the plant also has nearly 20,000 sq m of open green rooftop space for cyclists and runners. **CLARA CHONG** and **NG KENG GENE** take a closer look at this infrastructural feat.

EXTERNAL FACILITIES



- ✓ A Park Connector Network
- ✓ B Pavilion
- ✓ C Green roof
- ✓ D Water feature and security barrier
- ✓ E Bioretention basins (plants)
- ✓ F Promenade



THE PROCESS

Seawater

Around 3.3% salt content

Reservoir water

Around 0.05% salt content



1 Dual flow chamber

The Keppel Marina East Desalination Plant (KMEDP) is the only desalination plant in Singapore that can treat both saltwater and freshwater. It takes in reservoir water during rainy periods when water levels are high, and can also desalinate seawater during dry weather.



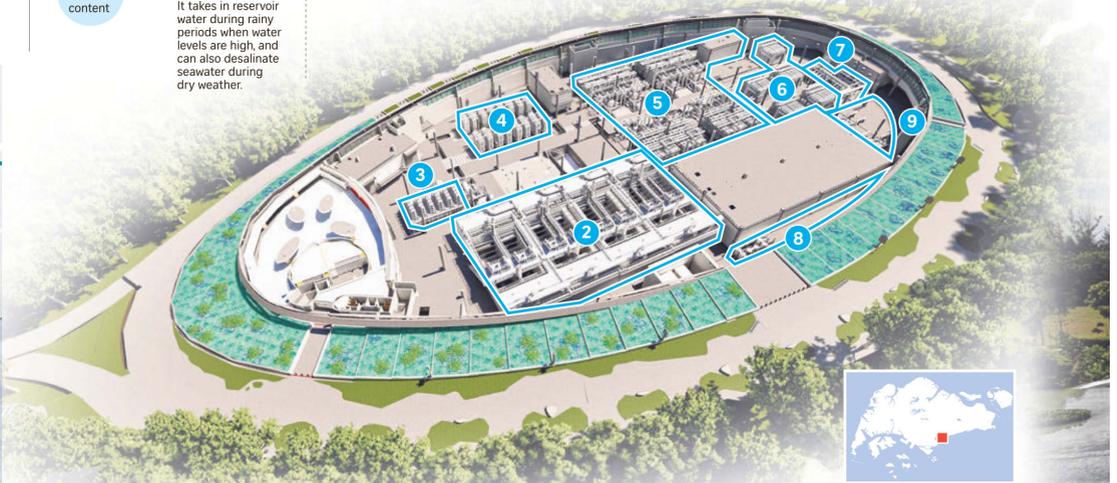
2 Dissolved air flotation

Removal of contaminants such as oil, algae and suspended solids.



3 Microstrainer system

Removes particles larger than 100 micrometres in size.



BY THE NUMBERS

KMEDP is Singapore's **4th** desalination plant

The plant can produce up to **30 million gallons** of fresh drinking water daily

1st water treatment plant to use ultraviolet rays in the primary disinfection process
Equipment and processes occupy an area of **2.4ha**

Will supply drinking water to PUB over a **25-year** concession period from 2020 to 2045

The auto strainer is an automatic self-cleaning disc filter that removes particles greater than **100 micrometres** in size, which is the diameter of a strand of hair

Uses the Ultraviolet-C system which renders **99.99%** of all viruses harmless in a fraction of a second

Energy saved every hour using the Energy Recovery Device is sufficient to power **28** 4-room HDB flats for a month

