

# 150 MLD SWRO DESALINATION PLANT

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## BACKGROUND:

The 150 MLD capacity desalination plant was intended to be set up in the vacant land available within the existing 100 MLD Desalination Plant at Nemmeli to meet the additional requirement of water for the expanded Chennai city. The 150 MLD SWRO Desalination Plant will be the largest desalination plant in the South Asia built in the smallest footprint of 10.5 acres to supply potable water. The project is being funded by KfW (German Funding Agency) and AMRUT (2015-16 & 2016-17).

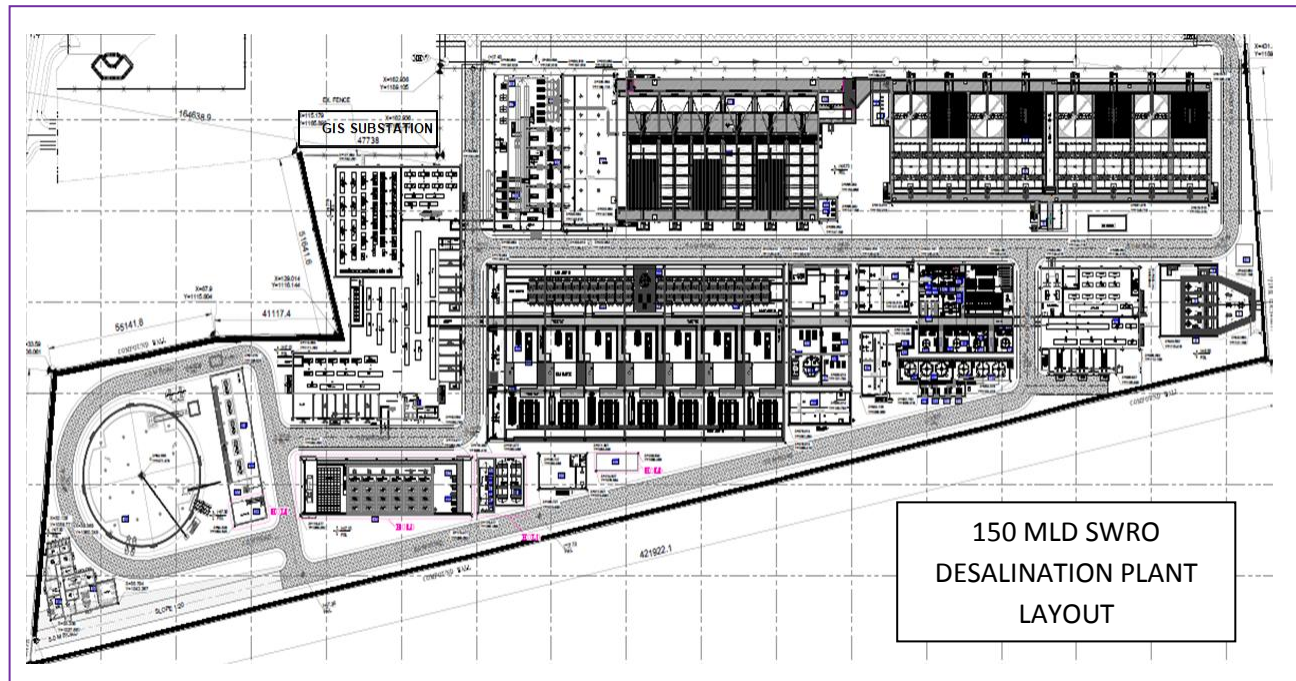
All the clearances including the clearances from MOEFF & CC (CRZ Clearance), TamilNadu Pollution Control Board, TamilNadu Maritime Board are in place for the project. The Environmental and Social Management Plan approved by the KfW (German Funding Agency) is being implemented by both Plant and Pipeline contractors and is being monitored by CMWSSB, Project Management Consultant and Independent Monitoring Consultant.

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The project consists of the following four components of work:

1. [Design, Build 150 MLD Capacity Desalination Plant based on SWRO at Nemmeli, East Coast Road Chennai, Tamil Nadu and Operation & Maintenance for 20 years.](#)

Work order was issued to the firm M/s.CobraInstalaciones Y Servicios S.A., Spain in JV with M/s.Tecton Engineering & Construction LLC., UAE. At present, the construction and erection (Mechanical, Electrical and Instrumentation) activities are in progress and 67% of the total works are completed.

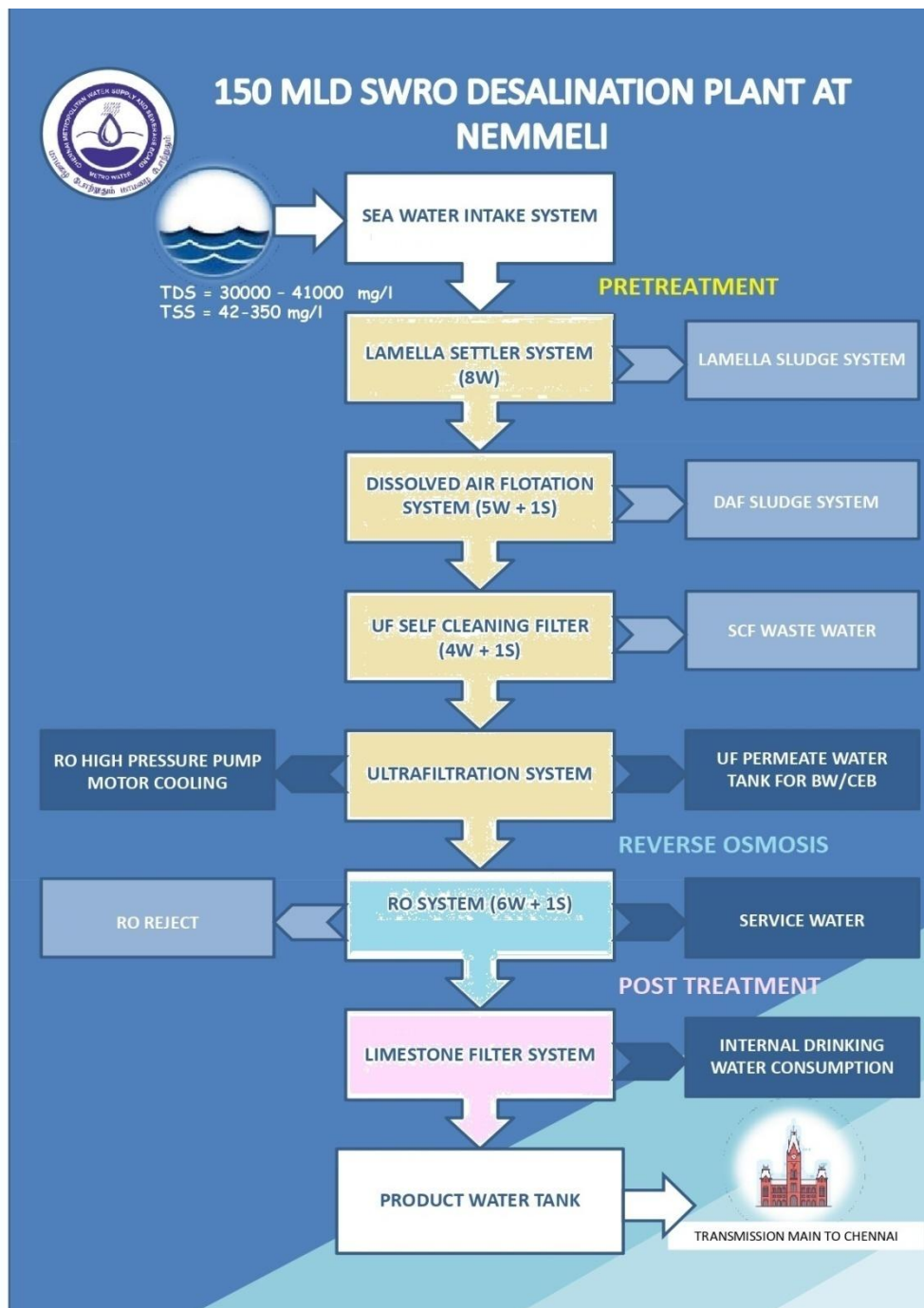


This work involves Seawater intake system, Pre-treatment units, RO plant with energy recovery system, post treatment units, reject disposal system, Product water tank and connected Pump House for transferring the Product Water. Sea Water Quality considered for the design of the facility

- TDS : 30,000-41,000 mg/l
- COD: 250 mg/l
- TOC: 20 mg/l
- Temperature : 25-32OC
- Suspended solids : 350 mg/l
- Oil and grease : 10 mg/l
- Algae cells count : 10,000,000 cells/l
- Hydrocarbons : 0.5 mg/l

Sea water drawn into the plant using 2250 mm OD High Density Polyethylene (HDPE) pipe through gravity. The pre-treatment consist of a three stage process in order to ensure sufficient safety in case of adverse seawater conditions and qualities.

- Lamella Clarifier
- DAF (Dissolved Air Flootation) system
- Ultra Filtration



Lamella clarifier is designed for clarification of water to reduce the TSS content to permissible limit. The seawater flows up in the direction opposite to gravity through the lamella plates after the coagulation and flocculation stages. The heavier floc settles on the inclined plates and gets collected in the bottom hopper. Flotation is a process of liquid-solid separation by upward displacement of particles insoluble in water, under the action of the field of gravity. Membrane filtration

involves passing the water to be treated through a thin polymer film called the “membrane”. The UF membrane filters the particles of size greater than 0.05 micron.

The Reverse Osmosis plant consists of seven (6W+1S) reverse osmosis independent trains with a daily gross unitary production of 25 MLD per skid. The flow of seawater reaching each skid, works with a recovery rate of 45%. The RO membrane has a pore size of 0.001 micron and hence the TDS of the sea water of range 30000 – 40000 ppm gets reduced to around 350 ppm. With the purpose of reducing the energy consumption in the high-pressure system, Energy Recovery Device is being installed to recover energy from the rejection due to their high efficiency. The treated water is discharged to the city transmission line after adjusting the RO permeate to drinking standards during post treatment.

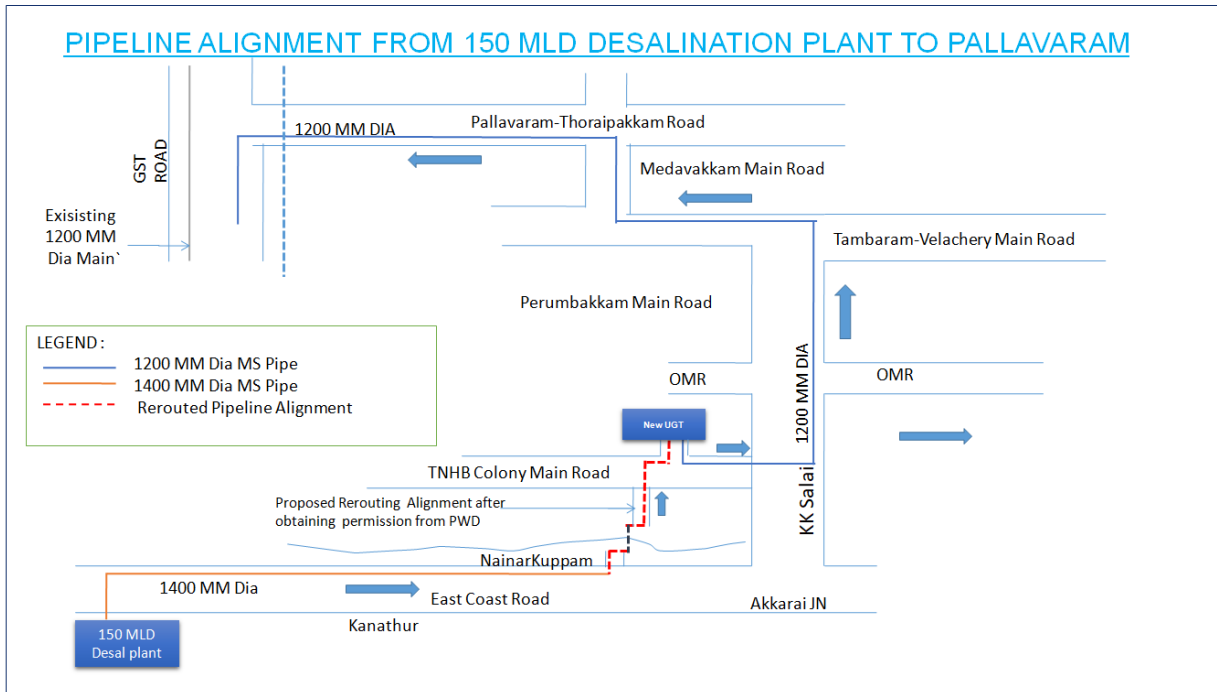
<b>TREATED WATER QUALITY</b>			
<b>S.NO</b>	<b>DESCRIPTION</b>	<b>UNIT</b>	<b>WATER QUALITY</b>
1	True color	Hazen	≤ 5.0
2	pH	-	6.5 – 8.5
3	Turbidity	NTU	≤ 1.0
4	TDS	mg/l	≤ 500
5	Chloride	mg/l	≤ 250
6	Free chlorine	mg/l	≤ 0.5
7	Boron	mg/l	≤ 1
8	LSI		Positive

All other parameters compliant with IS 10500 / 2012

## **2. Conveyance of 150 MLD of product water through from the Desalination Plant at Nemmeli and upto Pallavaram& all allied works including O&M for 20 years**

This work involves laying of 1400mm dia MS pipeline from Desal Plant to Shollinganallur Intermediate Pumping Station for a length of 21.95 km, laying of 1200mm dia MS pipeline from Akkarai Intermediate Pumping Station to link with existing 1200mm dia pipeline at Pallavaram GST Road for a length of 16.67 km, providing service line with 300mm dia DI pipeline along ECR for a length of 9.00 km and construction of UGT of 6.85ML capacity with pumping machineries and all

allied works. Work order was issued to M/s. JWIL Infra Ltd on 19.12.2019 with a contract period of 24 months and the contractor commenced the work on 20.07.2020.



Out of 47.63km, at present 47.35 Kms of pipes (1400 mm dia MS, 1200 mm dia MS and 300 mm dia DI pipes) were supplied at site and pipe laying has been completed for 43.26 Kms. In the intermediate pumping station at Shollinganallur, Civil works has been completed for UGT, Pumphouse, Control Room and Guard room. Erection of pumps, suction pipes, valves, delivery pipes and header pipe has been completed in the Pumphouse. As of now, 94.30% of the total works in Intermediate Pumping Station are completed.

The Kovalam and Muttukadu backwater Pipe Carrying Bridges are complete in all aspects. For the PCB at B-canal, fixing of handrails, clamps and painting works are in progress. As of now, 97.10% of the total works in the pipe carrying bridge component, are completed.

The overall physical progress of Pipeline package is 95.40%. The entire scheme is expected to be completed and commissioned by July 2023 and totally 9 lakh people in the South Chennai will be benefitted from the project.

### 3. Consultancy Services:

As part of the above works, the following consultancy services have been engaged:

Project Management Consultancy (PMC) services for “Construction Management and supervision including third party inspection” for the proposed construction of 150 MLD capacity SWRO Desalination Plant at Nemmeli and its Product Water Conveyance pipeline from the Plant and upto Pallavaram and all allied works“. Work order was issued to M/s. Tamil Nadu Water Investment Company Limited (TWIC). M/s.TWIC is scrutinizing the documents/drawings submitted and monitoring & supervising the day to day activities of both plant & pipeline works.

Independent Monitoring Consultancy (IMC) for ”Monitoring the Environmental and Social Impact during implementation of construction of 150 MLD capacity SWRO Desalination Plant at Nemmeli and its Product Water Conveyance pipeline from the Plant and up to Pallavaram“. M/s Lifeshell Labs is monitoring the implementation of the Environmental Social Management plans and is preparing the quarterly monitoring reports which is being submitted to KfW (German Funding Agency) and CMWSSB.