

Doha West wastewater treatment reuse plant



In a context of tremendous economic and water expansion of Doha City, the management and protection of water resources has long been a major issue for the PWA (Ashghal).

As part of its global wastewater management plan for Doha City, Ashghal has planned and contracted the construction of several wastewater plants, including a phased expansion of Doha West Waste Water Treatment Plant, which is today the country's largest operating wastewater treatment plant.

The first contract was signed in 2005 (stage 3) to design, build and operate a new plant of 135,000 m³/d with SUEZ. The expansion (stage 3 annexure 1) comes under a contract signed in 2010, raising the new plant capacity up to 175,500 m³/d.

Taking into account the former plant (70,000 m³/d), the global capacity of Doha West site reaches 245,500 m³/d.

These contracts have been implemented by a Joint Venture between SUEZ and its Japanese partner, Marubeni Corporation.

Equipped with a state-of-the-art membrane ultrafiltration system, the facility allows 100% of treated wastewater to be recycled. The water thus recycled is reused to agriculture, irrigation of green areas, market gardens and to aquifers recharge.

Doha West, stage 3

Under the first contract signed in 2005, SUEZ-Marubeni has designed, built and operated a new and complete sewage treatment facility of 135,000 m³/day.



water line

degrémont® process is based on several stages of treatment in order to deliver high quality effluent standard :

- Primary treatment by StepScreen and grit removal
- Activated sludge secondary treatment,
- Gravity sand filtration associated to Ultrafiltration membranes (Ultrablue™ ZW1000) allowing an excellent sanitary barrier for reuse.
- Chlorination

sludge line

Sludge is also extensively treated by :

- Gravity Belt Thickeners
- Aerobic Digestion
- Dewatering on centrifuges



air treatment

Biological odour removal with physico-chemical treatment on Azurair™ C (acids, bleach, sodium hydroxide, thiosulphate or bisulphite) combined with Azurair™ B (biological process on Biolite®) to reduce the cost of reagents.



Ultrablue™ ZW1000

a membrane filtration system incorporating membranes manufactured by General Electric (formerly Zenon).

The membranes consist of hollow fibers with a nominal pore size – the size of the smallest particles filtered out – of 0.02 µm. The membrane filtration uses an outside-in flow path. The membranes are clustered into modules, each with the capacity to provide either ≈42 or ≈51 m² of filtering surface area.

The Ultrablue™ ZW1000 system is made up of modules assembled inside cassettes positioned alongside one another immersed in a gravity-feed tank.



Doha West, expansion 3, annexure 1



Few times after the beginning of the operation of stage 3, in 2010, the needs for the inhabitants of the urban area exceeded the capacity of the plant. The facilities had to handle volumes superior to the initial requirements and nevertheless maintained the quality of the recycled water.

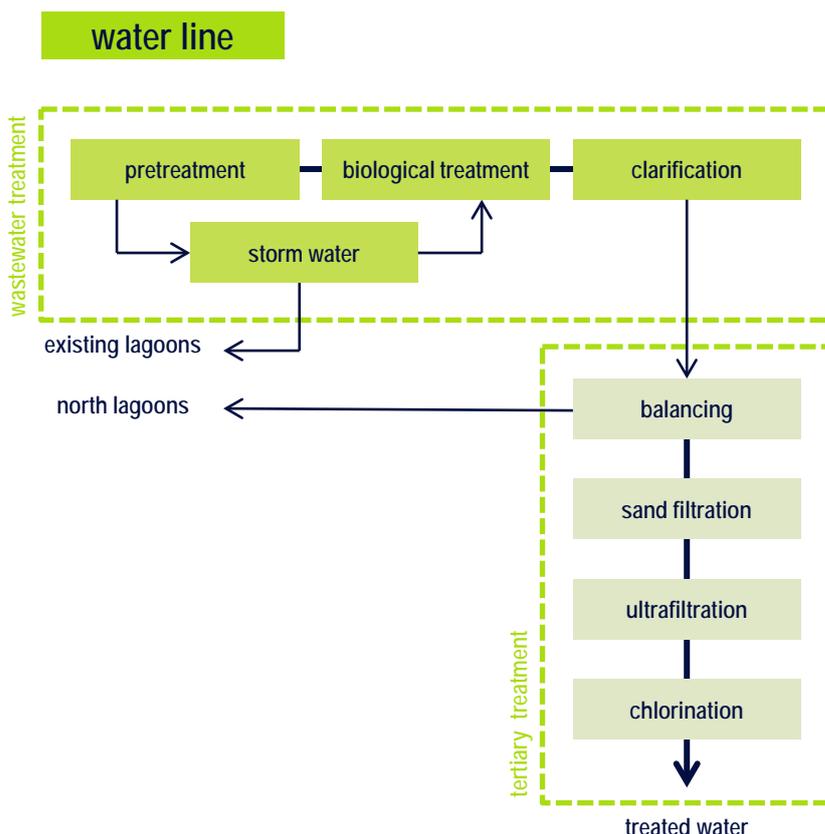
The robustness and the reliability of the installations established a reliable climate and consolidated the decision of Ashghal to award SUEZ a contract for an expansion of 40,500 m³/d using the same technology already installed.

Thanks to this expansion the new facility of Doha West, independently from the former plant, can now treat 175,500 m³/d of wastewater and satisfy the needs of 650,000 inhabitants.

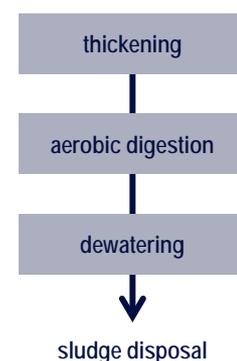
The construction ended in July 2012 with more that 3 months beforehand on the schedule. This rapidity is due to the experience already acquired on the previous projects, but also the optimal cooperation between the construction and O&M teams.

WATER LINE	stage 3	expansion 3, annexure 1
Screening (6 mm)	4 units	2 additional units
Grit traps (VORTEX type)	4 units	2 additional units
Aeration tanks	4 units	1 additional units
Blowers	4 units	1 additional unit
Clarifiers (suction type)	8 units	2 additional units
Sand filters	10 units	2 additional units
Membranes filtration	7 lines	1 additional line

SLUDGE LINE	stage 3	expansion 3, annexure 1
Centrifuge	3 units	2 additional units
Gravity Belt Thickeners	3 units	1 additional unit
Aerobic digesters	2 units	



sludge line





amendment of the former plant operation

The former plant of Doha West was to be demolished in 2009 during the commissioning of the new plant, but Ashghal preferred to keep the former factory in functioning in a totally independent way from new one. The operation has first been contracted to a local sub-contractor. In 2012, Ashghal decided to transfer the responsibility of the operation to SUEZ, within the framework of an amendment to our DBO (Design, Build, Operate) contract.

stakeholders

Client :
Ashghal PWA (Public Works Authority)

Consulting Engineer :
Nippon Koei

Construction :
JV SUEZ 50% / Marubeni 50%

Operation & Maintenance :
JV SUEZ 70% / Marubeni 30%

key dates

construction period

- stage 3 from December 2005 to March 2010
- expansion 3 – annexure 1 from January 2010 to July 2012

10 years operation & maintenance contract

- stage 3 from March 2010
- expansion 3 – annexure 1 from July 2012
- the former plant from December 2012 until 2020 for all facilities of Doha West site

O&M performances

- 100% of conformity for all parameters including suspended solids, BOD₅, COD
- Reuse of 100% of wastewater
- Superperformance in terms of capacity – successful management of inlet flows of up to 30% higher than designed

55%

of treated water is sent to agriculture in the farms located in the middle of the desert

42%

of treated water is sent to Doha City for irrigation of green areas

3%

of treated water is injected into the ground to recharge the aquifers

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Since March 2015, all the Group brands (Degrémont, Ozonia, Aquasource, Ondeo IS, Ameriwater, Infilco, Poseidon...) became SUEZ.

Meanwhile, from now on, the technologies and know-how of our Treatment Solutions offer will be distinguished with the label **degrémont®**.

