

water reclamation facility upgrades to latest SUEZ membrane technology

Application: Wastewater reclamation for reuse

Location: Peoria, Arizona, USA

Product: ZeeWeed* 500D and LEAPmbr*

Average Daily Flow (ADF): 10 MGD (37,900 m³/d)

Commissioned: June 2008

Upgraded: December 2015



Figure 1: The Butler Drive Water Reclamation Facility (WRF)

challenge

Located in Peoria, Arizona and in operation since 2008, the Butler Drive Water Reclamation Facility (WRF) has been utilizing SUEZ's ZeeWeed 500D (ZW500D) 340ft² modules for wastewater reclamation and groundwater recharge. The membranes in the plant were nearing their end of life and the City of Peoria decided to upgrade the WRF.

Aiming to upgrade the facility with the newest membrane technology, the Butler Drive WRF had the following objectives:

- Replace the existing membranes
- Reduce energy consumption
- Reduce maintenance costs
- Reduce membrane footprint

solution

To satisfy the customer's objectives, SUEZ provided 1,920 ZW500D 370ft² modules, and 40 LEAPmbr aeration kits for the full plant upgrade. In addition to the modules and kits, 40 cassettes were refurbished during the on-site installation (Figure 2). A comparison is made between the original and upgraded configuration at the Peoria WRF in Table 1 below.



Figure 2: A pair of refurbished cassettes at the WRF

Table 1: A comparison between the original and upgraded Butler Drive WRF

Parameter	Original	Upgrade
Module	ZW500D - 340ft ²	ZW500D - 370ft ²
Number of trains	10	10
Average Daily Flow [MGD]	10	10
Configuration	6 X 48M	4 X 48M
Total module surface area (ft ²)	979,200	710,400

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The LEAPmbr aeration upgrade reduced energy consumption for the facility. More specifically, LEAPmbr reduced the aeration demand and

eliminated the need to cycle air valves. Figure 3 shows a stand-alone LEAPmbr train.

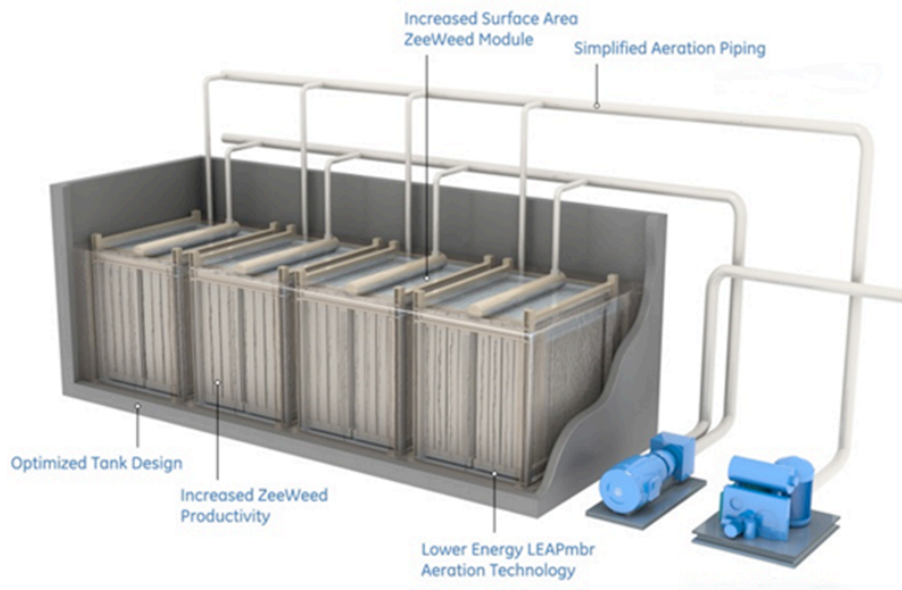


Figure 3: A typical LEAPmbr train configuration with dedicated blower

In addition to decreasing membrane surface area, the modules were sent to the plant in shipping frames to avoid environmental waste and spacing issues caused by bags and crates. In total, 64 shipping frames were required for the project with each frame carrying 30 membrane modules.

Furthermore, the City of Peoria decided it would be economical to refurbish the cassettes that would house the new modules. This was accomplished by providing 40 cassette refurbishment kits that were installed on-site.

results

The new ZW500D modules reduced the plant module surface area by 27%. Despite having fewer modules and surface area, the upgraded configuration has maintained the original permeate production of 10 MGD (ADF). This is achieved with improved fiber chemistry, allowing the membranes to filter water at a higher flux than previously.

Thanks to the LEAPmbr upgrade, energy consumption at the facility was decreased by reducing the air demand required by the blower. During night-time operation, the WRF intends to operate on an air-share program that will allow the Butler WRF to utilize the air flow from the process side of the facility. By

effectively reducing the blower load, a 30% reduction in energy consumption may be achieved.

Lastly, PLC programming for the aeration upgrade was done onsite by a SUEZ specialist to avoid any need for plant downtime.

advantages of LEAPmbr aeration

By upgrading to LEAPmbr aeration technology, Butler Drive WRF will be able to take advantage of the following benefits:

- Larger air bubble size which increases shear along membrane surface, reducing fouling.
- Continuous air flow at significantly lower flow rates.
- Simplified aeration system controls.
- Energy consumption savings related to reduced membrane blower load.
- Cyclic valve maintenance savings.



Cyclic aeration



LEAPmbr aeration