CASE STORY

AQUAPORIN

Well water treatment for municipal drinking water

Improve treatment efficiency with lower OPEX.

Challenge

emaser s.a., a joint venture majority-owned by Aqualia operates a water treatment plant in a Spanish municipality in Ciudad Real where the local well water has high levels of sulfate and nitrate. To provide safe and high-quality water for human consumption and meet local drinking water requirements, emaser operates this brackish water reverse osmosis (BWRO) system to treat the well water and supply water to the municipality. In a continuous commitment to improve the treatment efficiency with innovative technologies, emaser is upgrading some facilities with Aquaporin Inside® CLEAR Ultra BWRO membranes.

RO system facts

Plant Location / Commissioning	Ciudad Real, Spain / March 2023
Feed Water Source	Well water
System Capacity	Total 1400 m3/day, 2 racks
Target Recovery	75%
Configuration of each rack	2 stages (3x6 - 2x6)
RO Membrane	60 pieces of Aquaporin Inside® CLEAR Ultra 8040-440

Outcome

The system is able to achieve a better rejection rate – 98.1% with CLEAR Ultra vs 94.6% with the replaced membranes – while operating with 13% lower feed pressure (Figure 1).
The system rejects sulfate, nitrate and several ions effectively (Table 1).
The system shows a stable operation with moderate cleaning or maintenance (Figure 2).

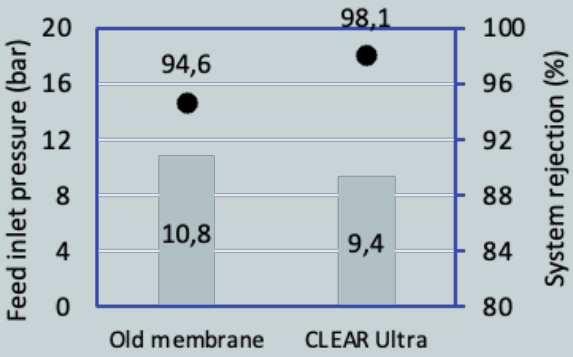

Figure 1. Feed inlet pressure and system rejection before and after switching to CLEAR Ultra 8040

Table 1. Selected parameters' rejection performance

Key parameters	Feed (mg/L)	Permeate (mg/L)	Rejection (%)
Chloride	82.9	4.0	95.1
Nitrate	34.2	7.7	77.6
Sulfate	372.8	0.8	99.8
Magnesium	49.6	0.4	99.3
Calcium	184.8	1.5	99.2

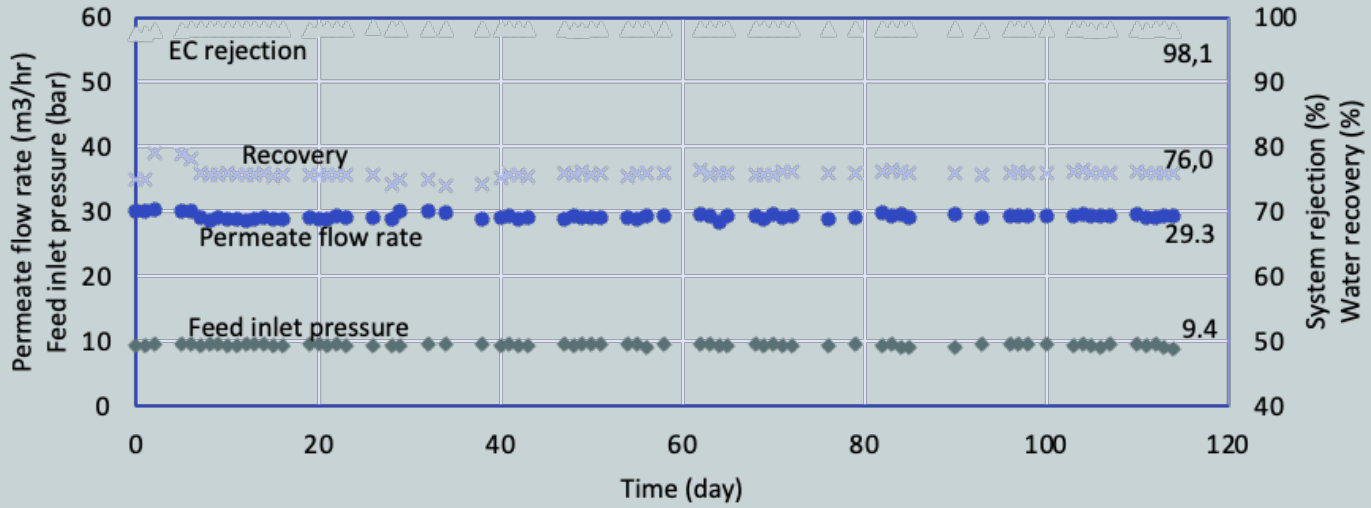

Figure 2. Stable operation of the CLEAR Ultra in the RO system over 3 months

Conclusion

emaser is satisfied with the overall improved system OPEX and the blended water quality, which allows them to better fulfill the local drinking water requirements.