

PolyCera® Titan UF membranes for O&G, iron and solid removal before electro-dialysis reversal (EDR) in a commercial produced water desalination application



Upstream
Oil & Gas



Wyoming, USA



Produced Water
Reuse



\$3B Market

Overview:

- Reuse and recycle of oil and gas produced water constitutes a new frontier of desalination. Application of RO, EDR, or other salt removal technology in such a scenario is often impractical without reliable pretreatment. A major shortcoming of conventional oil-field pre-treatment processes is their inability to sustain a consistently low-level of free oil & grease, iron, turbidity and SDI in their effluent.
- A produced water treatment facility in Central Wyoming, USA, was seeking a process solution that consistently and dependably treat their produced and frac water to meet the site environmental requirements while minimizing capital and operating costs.
- **PolyCera Titan** robust ultrafiltration (UF) membranes, designed for produced water treatment, offer improved fouling resistance, lower energy requirements and less intensive cleaning to maintain a reliable and sustainable operation.

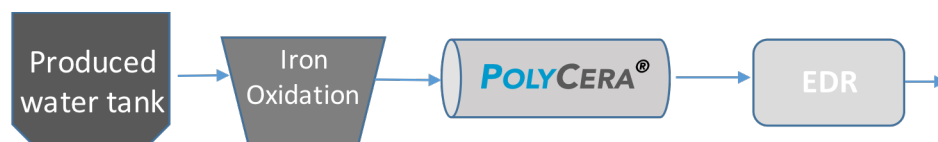
Demonstration:

- **PolyCera Titan** based treatment system, for 7 weeks performed separation of oils, solids, iron and other remaining contaminants from produced and flowback water.
- The key objective of the demonstration was to gather necessary information to prescribe an optimal solution for full-scale implementation and to achieve the quality standards defined by post EDR requirements (iron < 0.5 ppm, TSS and O&G < 1 ppm) and overall client goals.



PolyCera Titan membrane skid

Process Flow Diagram



Results:

- Despite the challenging feed water quality (up to 25 ppm of O&G, 95 NTU of turbidity, 450 ppm of TOC and up to 8 ppm of iron), **PolyCera Titan** based system produced excellent water quality suitable to feed an EDR system.
- The **PolyCera Titan** based UF platform provided net recovery of 89%, and average specific energy consumption (SEC) of 0.027 kWh/barrel of throughput, what lead to operational cost of ~ 0.044 \$/bbl.
- All water quality requirements specified by the clients were satisfy providing a unique, effective, and low cost solution for the produced water treatment.

PolyCera Titan

89%

Net recovery

0.027
kWh/bbl

SEC

< 1 NTU

Filtrate Turbidity

< 1 ppm

O&G

~0.044

\$/bbl

UF OPEX

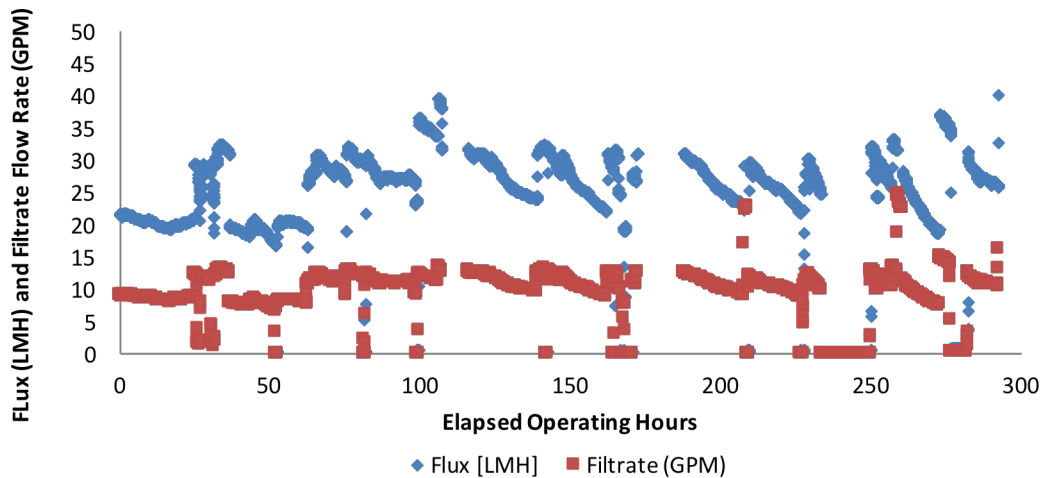


Figure 1. Consistent UF filtrate production during the 300 hours of operation

Value Proposition:

- **PolyCera Titan** UF membranes provide effective and reliable pretreatment before advanced treatment technologies, including desalination, in water reuses applications
- **PolyCera Titan** membranes are made from a polymer material that has superior threshold for withstanding highly fouling prone waters, where they exhibit high cleanability and complete flux recovery after fouling.
- **PolyCera Titan** membranes bridge the gap between the performance of ceramic membranes and the low cost of polymeric membranes and provide more water at lower cost.

*Check other available case studies for PolyCera Titan and Hydro membranes performing in produced and industrial wastewater treatment applications.
Learn about other PolyCera membranes, properties, and configurations.*