

PolyCera® Hydro UF membranes demonstrate high fouling resistance and clean-ability in tertiary filtration of municipal secondary effluent

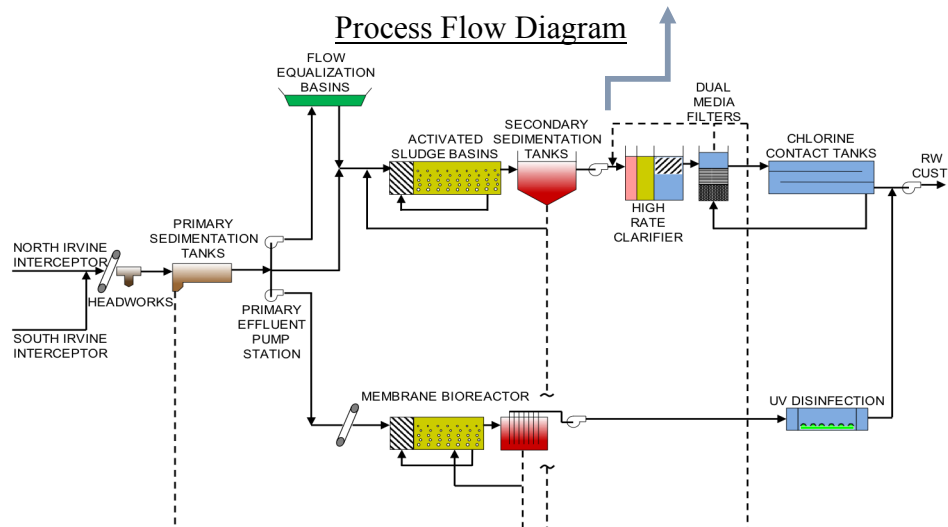
Overview:

- Low-pressure membrane filtration, which includes microfiltration and ultrafiltration (MF/UF), has experienced tremendous growth in the municipal and industrial water treatment sectors.
- These applications require a robust membrane that is tolerant to secondary effluent organic matter, resist to cleaning chemicals and mechanical wear.
- **PolyCera Hydro** UF membranes offer all of these features along with higher water permeability and lower operating pressure. The membrane is hydrophilic, and requires less frequent backwashing and is easier to clean.



Demonstration:

- Water Planet conducted a six-month demonstration on secondary effluent at the Irvine Ranch Water District (IRWD), Michelson Water Recycling Plant.
- The long-term objectives of the study were to evaluate the performance and value proposition of the **PolyCera Hydro** UF membrane over conventional membrane materials in providing California Title 22 equivalent product water after direct filtration of secondary treated sewage.
- **PolyCera Hydro** UF membranes and a “hydrophilic” PVDF UF membrane were both packaged into Water Planet’s Spiral Monolith® elements.
- Operated at identical flux rates, the filtrate water quality, membrane permeability, specific energy consumption (SEC) and operating expense (OPEX) were compared.



Results:

- Both PVDF UF and **PolyCera Hydro** UF membranes consistently provided California Title 22 quality effluent water suitable for reuse.
- **PolyCera Hydro** UF membranes sustained a filtrate flux of 50 LMH over multiple weeks using a 88 ppm chlorine maintenance cleaning every 6 days and a full clean-in-place (CIP) every 38 days.
- **PolyCera Hydro** UF membranes had 50% less irreversible fouling than the PVDF membrane, which would result in twice the runtime between chemical cleanings for **PolyCera**.
- **PolyCera Hydro** UF membranes easier clean-ability allowed for operation without energy-intensive air scouring, which resulted in reduced energy demand and chemical consumption.

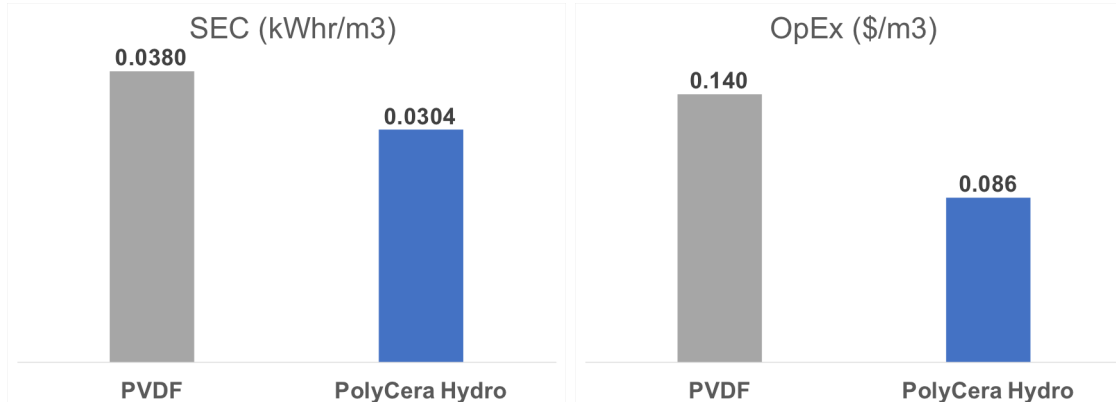


Figure 1. SEC and OpEx for PolyCera Hydro and PVDF membranes.

Value Proposition:

- **PolyCera Hydro** membrane chemistry, which is intrinsically less fouling prone and easy to clean, provides **more water at a lower cost**.
- **PolyCera Hydro** UF membrane chemistry is intrinsically less fouling prone and easier to clean than conventional PVDF:
 - ✓ 23% higher water recovery
 - ✓ 20% lower energy demand
 - ✓ 50% less irreversible fouling
 - ✓ 46% lower OPEX
 - ✓ 2X membrane useful life

PolyCera Hydro

23%

Higher Water Recovery

20%

Lower Energy Demand

46%

Lower OpEx

50%

Lower Irreversible Fouling Rate

<0.1 NTU

Filtrate Turbidity

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