

PolyCera® Hydro UF membranes delivering exceptional results on a tertiary wastewater application for industrial reuse



Tertiary Wastewater



Texas, USA



Water Reuse



\$5B Market

Overview:

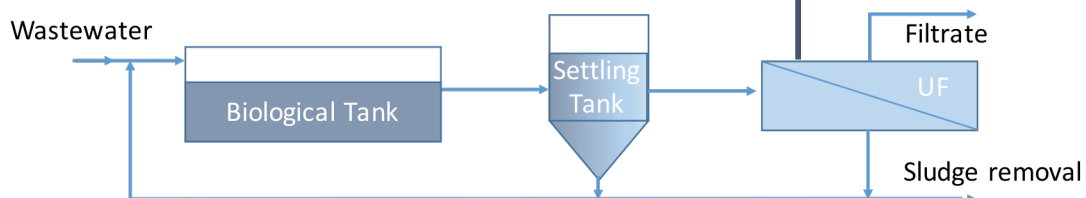
- Reuse of municipal and industrial wastewater has gained global acceptance as a method to mitigate widespread water scarcity and drought.
- Currently, many conventional wastewater treatment processes cannot consistently treat wastewater to a high quality standards required for beneficial reuse.
- **PolyCera Hydro** UF membranes were implemented in tertiary filtration mode after moving bed bio-reactor (MBBR) process to enable affordable and reliable water reuse in mobile, off-grid wastewater treatment units.

Application:

- **WaterFleet**, a San Antonio, Texas based company, supplies mobile water and wastewater treatment systems to off-grid man-camps supporting oil & gas drilling and completion sites as well as remote construction sites.
- Previously, **WaterFleet** tested hollow fiber and spiral wound PVDF UF membranes, all of which failed within days to weeks in this challenging application. As a result, **WaterFleet** was not able to consistently meet the state of Texas' Type 1 water reuse quality.
- **PolyCera Hydro** UF membranes and "hydrophilic" PVDF UF membranes - packaged into Water Planet's Spiral Monolith® elements - filtered effluent from a biological treatment process.
- Operated at identical flux rates, the filtrate water quality, membrane permeability, specific energy consumption (SEC) and operating expense (OPEX) were compared.



Process Flow Diagram



PolyCera Hydro

Results:

- **PolyCera Hydro** UF provided nearly 3X higher water permeability when filtering the secondary effluent (21 vs. 7.9 lmh/bar) and much higher water recovery due to less frequent and less intense backwashing and cleaning. The PVDF membranes experienced unrecoverable permeability loss after only 48 hours of operation, whereas the **PolyCera Hydro** membranes have now been in operation for over 12 months.
- **PolyCera Hydro** UF consistently produced effluent water quality suitable for Type 1 non-potable reuse and safe environmental discharge.
- **PolyCera Hydro** UF membranes delivered 6:4:3 log removal of pathogenic microorganisms (bacteria: virus: protozoa), removed solids and turbidity, and operated at a high sustainable flux.

165%

Higher Water Permeability

54%

Lower Specific Energy Consumption

42%

Lower OPEX

<0.1 NTU

Filtrate turbidity

<1.0 mg/L

Filtrate TSS

>5 log

Removal of coliform bacteria

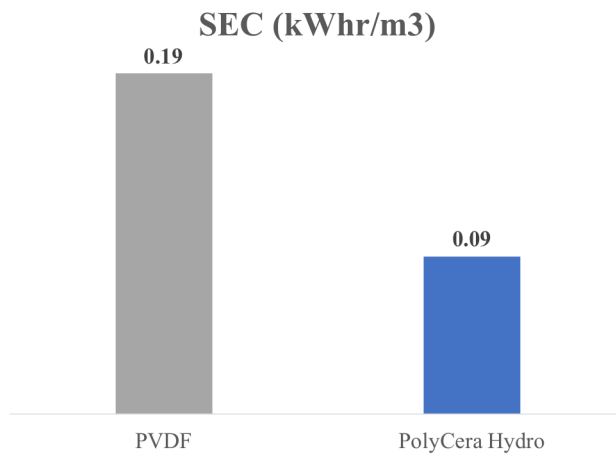
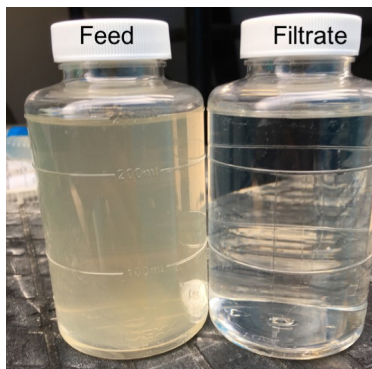


Figure 1. PolyCera Hydro membrane feed and filtrate, and SEC relative to PVDF.

Value Proposition:

- **PolyCera Hydro** membrane chemistry, which is intrinsically less fouling prone and easy to clean, provides **more water at a lower cost**.
- With **PolyCera Hydro** membranes integrated into the process train, Type I Texas reclaimed water quality is produced.
- **WaterFleet** is now using **PolyCera Hydro** membranes across their entire fleet of mobile water reuse systems. The membranes provide the client with a high quality effluent with sustainable operation and economics.

*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.*