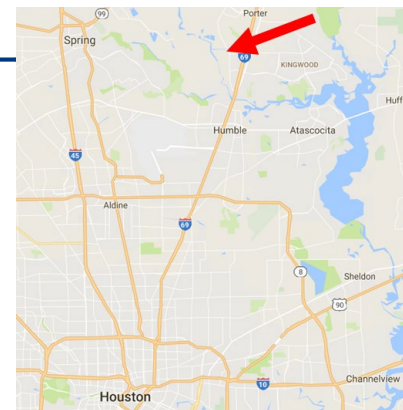


# Drinking Water- Competitive Surface Water Pilot Evaluation: Surface Water – Porter, TX



## Background

Porter, Texas has conducted simultaneous membrane filtration surface water pilots to compare the cost and performance of four major membrane technology suppliers for a new 4+ MGD Drinking Water Plant. Surface water is drawn from a reservoir hydraulically linked to the San Jacinto River, upstream of Lake Houston. A unique feature of the test program is that no membrane pretreatment is provided, and the raw feed water is simultaneously sent to all four membrane pilots. Source water pretreatment if required is provided by each membrane vendor.



## Competitive Test Program Set Up

Pilot plants from 4 different membrane vendors arrived on site summer of 2019. These pilot plants were operated by the city and the test program was managed by Ardurro Consulting Engineers. The pilot program was completed January 2020.



**Toray**



**Pall**



**Koch**



**Purifics**

## Full Scale Solution

The pilot is complete.

The next phase is full scale design.

**Cuf** DM52 is baseline.



**Cuf** Feed and Filtrate

## Comparative Performance

TCEQ requires a 90-day pilot in 3 stages. Stage 1 is optimization, stage 2 is a 30-day sustained operating period at optimized parameters (i.e. TMP, Flux, coagulant type and dose), and stage 3 is a minimum 10-day period to demonstrate membrane integrity no irreversible membrane fouling has occurred.

Purification Parameter	Toray	Pall	Koch	CUF
Flux (GFD)	20*	60*	54*	287
Filtration Cycle (min)	15-30	~ 15-30	~ 15-30	~30,000**
Turbidity (Feed 150) NTU	0.036	0.012		0.013
TOC (Feed 6) ppm	3.7	4.3	4.3	2.5

\* May or may not be corrected for backwash. \*\* Operating 21 days between rinses for 30 days sustained test trial at rated flux. .

## **Cuf** Performance: Stage 2: 30-Day Sustained Operating Period Average

Parameter	Units	Raw	Post CUF
Turbidity	NTU	116.8	0.0174
pH	-	6.1	6.1
Alkalinity	mg/L (as CaCO <sub>3</sub> )	23.1	24.2
Temperature	°C	20.3	21.5
TOC	mg/L	3.53	1.63
DOC	mg/L	3.23	1.53
UV-254	cm <sup>-1</sup>	0.073	0.039
True Color	PCU	11.0	ND
Total Hardness	mg/L (as CaCO <sub>3</sub> )	19.0	18.8
Total Fe	mg/L	2.016	ND
Total Mn	mg/L	0.056	ND
Al	mg/L	6.99	0.015
Si	mg/L	11.39	3.29
TDS	mg/L	51.6	57.2
TSS	mg/L	131.4	NS

Purifics **Cuf** process demonstrated the best, longest and most consistent performance, and without any pretreatment of the source water.



340 Sovereign Rd, London, ON, Canada, N6M 1A8  
519.473.5788, info@Purifics.com, www.Purifics.com

Purifics, Photo-Cat, AOP\*, FDR, DeWRS & **Cuf** are registered trademarks. Purifics products are protected by one or more of the following US Patents: US Patent #5,462,674 / #5,554,300 / #5,589,078 / #6,136,203 / #6,215,126B1 / #6,398,971B1 / #7,008,473B2 / #7,326,278B2 / #7,425,272B2 / #7,588,688B2 / #7,800,310B2 / #7,837,952B2 / #9,259,502B2 / #9,133,047B2 / #8,491,789 / #10,071,927 / #10,005,686 / #10,315,935. Domestic & foreign patents & pending.