

Superior PFAS* Removal by TFN RO Membranes

*Per- and Polyfluoroalkyl Substances (PFAS)

LG NanoH₂O™ thin-film nanocomposite (TFN) reverse osmosis membrane technology has proven effective in removing PFAS at various contamination sites in the U.S., reducing PFAS to non-detectable levels



North Carolina

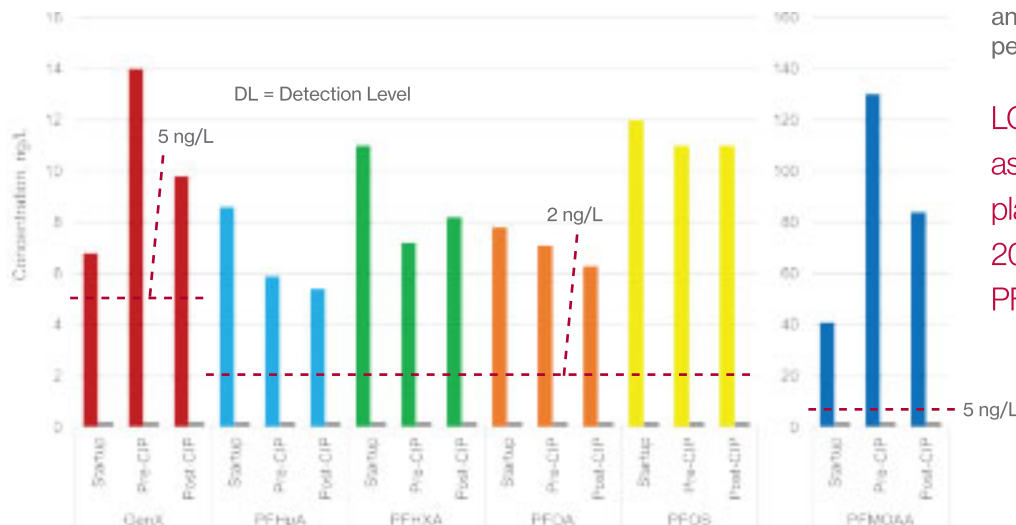
Brunswick County Northwest Water Treatment Plant

The Cape Fear River experienced PFAS contamination due to a manufacturer of GenX (a PFOA alternative) situated 80 miles northwest of the water treatment plant. A pilot study was conducted to evaluate the integration of reverse osmosis (RO) into the existing 24 MGD conventional treatment plant, expanding it to incorporate a 36 MGD reverse osmosis system for effective PFAS removal.



Table 1: Pilot Description		Table 2: Pilot Objectives	
Duration	Dec 2018 – Mar 2019	Target contaminants	Treatment goals
Feed water intake	NWTP effluent	GenX	<5 ng/L (RL) or >95% removal
Configuration	2:1 skid, 8M (4-inch element)	PFMOAA and other PFAS	< 5 ng/L (RL) or >90% removal
System recovery	85–92%	<ul style="list-style-type: none"> LPRO system evaluated to be about 20% less expensive to operate vs. GAC over 25-year period When completed in 2024, BCNWTP will be the first surface water treatment facility in the U.S. to use reverse osmosis to remove PFAS 	
System capacity	20.1 gpm (110 m ³ /d)		
System flux	14.2 gfd		
Membrane model	Energy-saving LG BW 4040 ES		
Feed pressure	140–170 psi		

BCNWTP Contaminant Removal via TFN Membrane



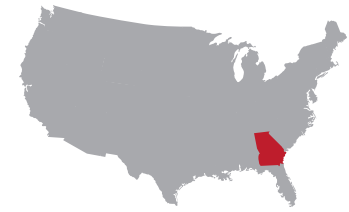
Concentrations of GenX, other PFAS and 1,4-Dioxane non-detect levels in the permeate after treatment with RO

LG Water Solutions was selected as the RO supplier for the full-scale plant. Upon its commissioning in 2024, it will be the largest RO plant for PFAS removal in the United States.

Georgia

Bruce Hamler Water Treatment Facility

PFAS contamination of the Oostanaula and Etowah Rivers by various carpet manufacturers. The 18 MGD water treatment facility currently treats the surface water via conventional methods using flocculation, settling, and filtration.



Dominant PFAS contaminant in feed water

- PFBS (Perfluorobutanesulfonic acid), PFHxA (Perfluorohexanoic acid)

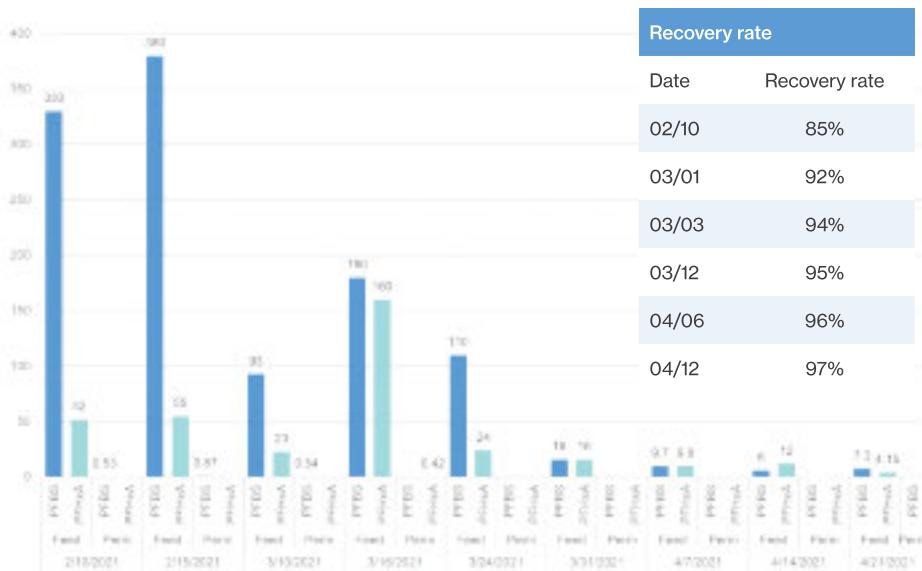
RO pilot objectives¹

- Demonstrate steady removal of 25 PFAS compounds, including short-chain compounds, to non-detectable levels
- Achieve the highest possible recovery rate
- Determine critical design parameters for full-scale implementation

¹ Rotec Flow-Reversal RO technology applied to the pilot system by AdEdge Water Technologies to reduce the risk of RO scaling, increase recovery rate, and lower concentrate volume

Table 3: RO Pilot Description

Duration	2/10/2021 – 4/24/2021
Feed water intake	Surface water
Configuration	3:2:1 skid, 8M, FR-RO
System recovery	Up to 97%
System capacity	22–23 gpm
System flux	8.1 gfd
Membrane model	Energy-saving LG BW 4040 ES
Feed pressure	60–80 psi



RO pilot results

- FR-RO system using energy-saving LG NanoH₂O™ RO membranes exceeded target criteria for 25 PFAS compounds
- PFBS: 99.42% rejection, 94% recovery
- PFHxA: 99.74% rejection, 95% recovery
- Complete removal of PFAS achieved at 97% recovery with stable flux and differential pressure

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