Georgia, U.S.

A city in Midwest Georgia operates a drinking water plant supplied by a well with surface water influence. The source experiences irregular turbidity spikes, *E. coli*, and both short- and long-chain PFAS, creating challenges for conventional treatment. Although a conventional treatment system existed on site, it was never fully functional and would not have addressed PFAS without future bolt-on processes. As a result, the municipality required a robust, automated, and low-maintenance solution capable of achieving regulatory compliance, operational stability, and long-term sustainability within a single integrated system.

Pilot Program Overview

In October 2025, an on-site pilot verification was initiated and operated continuously through January 2026 to validate CUF performance under actual operating conditions and to optimize system parameters for full-scale design. The goals included:

- Ensuring 100% E-Coli removal
- Stabilizing filtrate turbidity during unpredictable spikes
- Demonstrating PFAS removal to non-detect
- Operating with Zero Liquid Discharge
- Eliminating pre-treatment steps and additional bolt-on technologies

Direct Source-to-Clear-Well Operation

The *Cuf* pilot processed water directly from the well, with:

- **No pre-treatment**
- **No media filters or additional bolt-on technologies**
- **No membrane replacement or backwash**

This allowed the city to evaluate true lifecycle performance without the support systems required by conventional filtration.

Performance Highlights

During testing, the pilot encountered irregular turbidity spikes from the well. ***Cuf*** maintained consistent, stable water quality throughout the event.

- Turbidity spikes had no impact on system flux or recovery
- Demonstrated high resilience to rapidly changing raw water conditions

This validated ***Cuf*** as a reliable solution for applications with unpredictable solids loading.

Proven PFAS Removal in a Single Operation

The ***Cuf*** system demonstrated non-detect removal of multiple PFAS compounds using precise metering of **Colloidal Activated Carbon (CAC).**

CAC offers several key advantages:

- Significantly larger surface area for rapid adsorption and kinetics
- Full compatibility with the ***Cuf*** process
- No media filters or cartridges required

Parameter	Unit	Raw Water	*Cuf* + CAC
PFOS	ppt	38	ND
PFOA	ppt	63	ND
PFHpA	ppt	15	ND
PFDA	ppt	4.4	ND
PFNA	ppt	11	ND
PFHxS	ppt	2.6	ND
Total (ppt)	ppt	134	0

Cuf effectively utilizes the superior properties of **CAC** by keeping it in a controlled, reactive, and recoverable state within the treatment process.

PFAS Solids Recovery & ZLD Operation

As part of the ***Cuf*** process, the Solids Recovery Unit (***SRU***) enables complete capture of all solids generated during purification, including those from turbidity spikes and **CAC** with captured PFAS. This integrated design achieves true Zero Liquid Discharge, recovering 100% of the treated water through a fully automated, chemical-free and labor-free process with no filtrate loss.

Conclusion

Overall, the results confirm ***Cuf*** as superior long-term solution, proving stable performance despite variations in raw water quality and consistently delivering 100% water recovery through the ***SRU***. Its compact, operator-friendly design and low chemical requirements offers significant reductions in lifecycle cost and operational complexity.