

### Case History

#### Application

Purification of surface water with PFAS and other contaminants to drinking water standards with regulatory compliance and Zero Liquid Discharge (ZLD).

#### Background

The Tennessee River water poses the usual challenges of metals (Fe, Mn) and background organics such as TOC, DOC, NOM and THM & HAA precursors. The source water faces the additional challenge of PFAS contamination that changes in concentration and composition with seasonal and weather events to exceed regulatory standards.

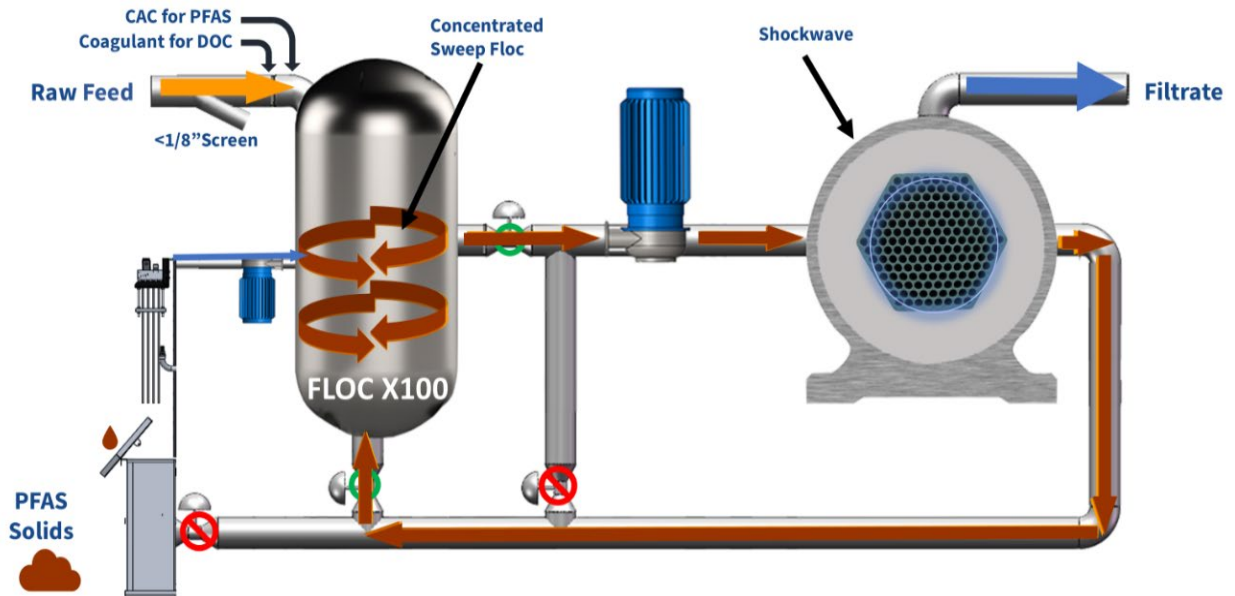


The *Cuf* process, has the ability, to precisely inject, mix, and hold Colloidal Activated Carbon creating a reliable, low-cost and flexible PFAS solution for water purification. The *Cuf* process has no pre-treatment, has 100% water efficiency, Zero Liquid Discharge (ZLD) and is NSF/ANSI/CAN 61-372 Certified.





## Cuf Activated Carbon Solution



### On Site Verification Performance

Sustained PFAS removal using **CAC** on the more challenging surface water with elevated levels of background TOC/DOC/NOM was piloted on site.





### Cuf Activated Carbon Performance

The pilot was conducted using the equipment identified above taking water directly from the Tennessee river (no pretreatment) and background TOC of nominally 1.8 ppm to produce filtrate water quality as shown below

Source – Tennessee River   End Use – Drinking Water   Flux – 250 GFD		
Contaminant	Feed (ng/L)	Filtrate (ng/L)
DOC	Variable	Below MCL
PFOS	6.7	<2.0
PFOA	3.3	<2.0
PFHxA	2.1	<2.0
PFBS	2.6	<2.0
PFBA	4.0	<2.0



The Cuf pilot process demonstrated;

- Sustained 100% water efficiency
- Zero Liquid Discharge
- TOC removal 1.87 ppm → 1.33 ppm
- The **Elimnation** of pretreatment, back wash and CIP





- Purification of river water to drinking water standards, including PFAS, in a single platform in a 4 minute process time.
- Continuously produced water at 7 day intervals between rinses

The picture below shows De-Watered **CAC** solids being discharged from the process in real time. The picture shows the solids falling off the flat plate SIC membrane after a dynamic shock wave.



## Performance Note

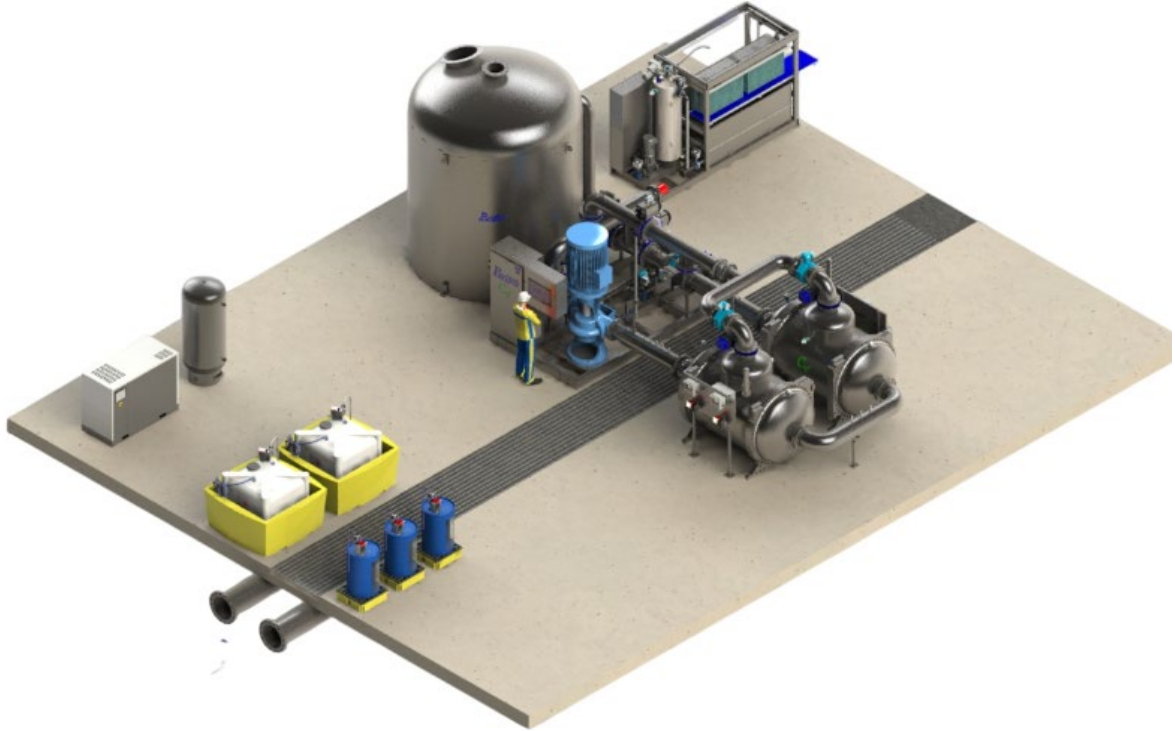
This is a high-performance achievement as surface water is much more challenging to process due to the high organic background that competes for the activated carbon. This challenge is not present in the easier purified ground water. The **Cuf** operation is consistent, sustained, durable and proven in municipal drinking water since 2014.





## Cuf CAC Solution for PFAS

This solution, currently in full scale design, consists of the following.



### Environmental & Economic Advantage

Producing Better Water At Lower Cost



### Reference Documents

- On-Site Pilot Verification Program.
- Pilot Report
- Why **Cuf** for PFAS Removal.
- **Cuf** Process.

