

The PFAS Challenge at Fairfax Water

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Fairfax Water

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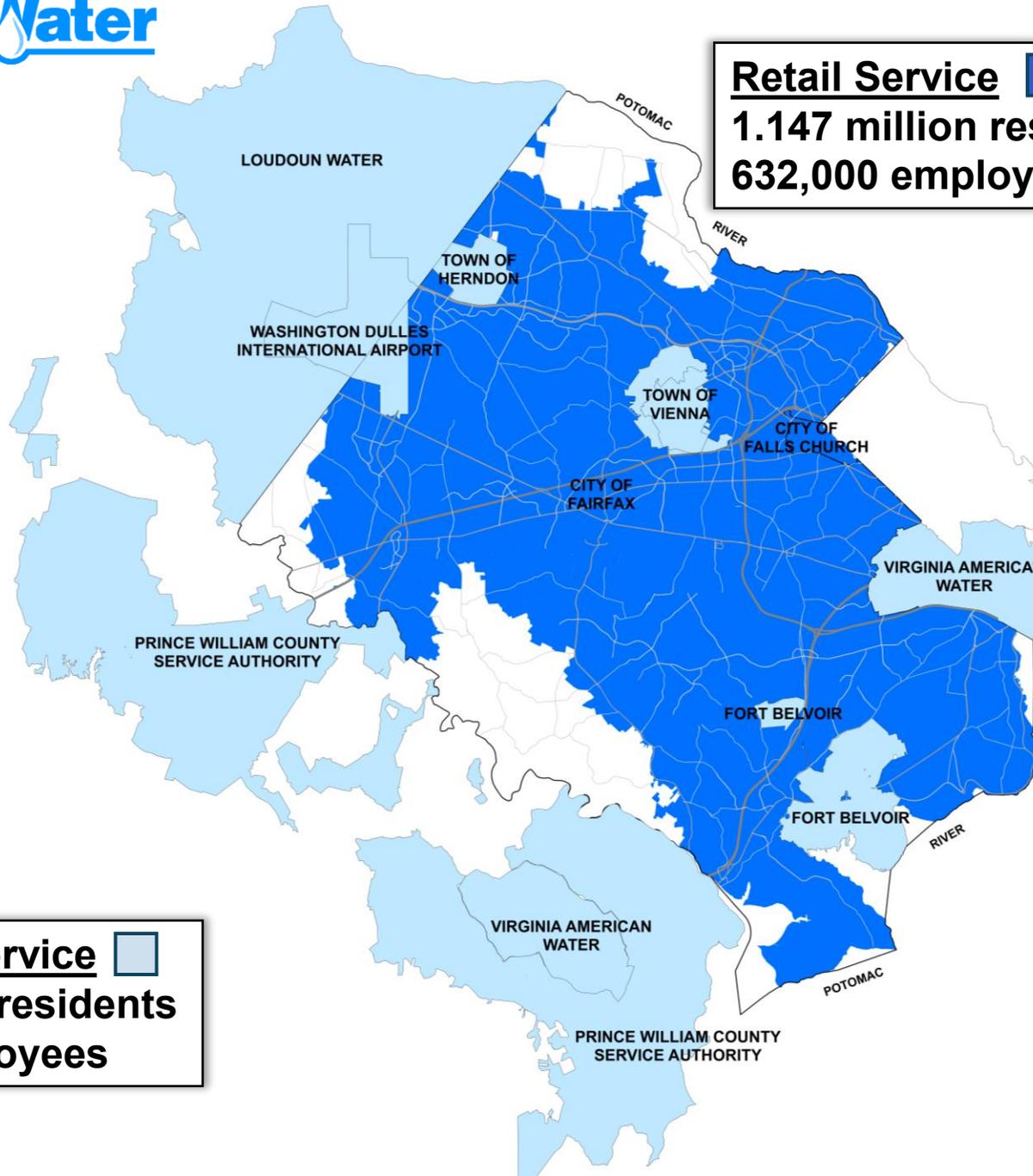


Topics

- ◆ Fairfax Water Service Area and Sources
- ◆ PFAS Detections and Regulations
- ◆ Roadmap to PFAS Compliance
- ◆ Source Protection Efforts
- ◆ Water Treatment
- ◆ Regional Collaboration on PFAS issues

Retail Service ■
1.147 million residents
632,000 employees

Wholesale Partners and Communities Served



Wholesale Service ■
1.021 million residents
490,000 employees



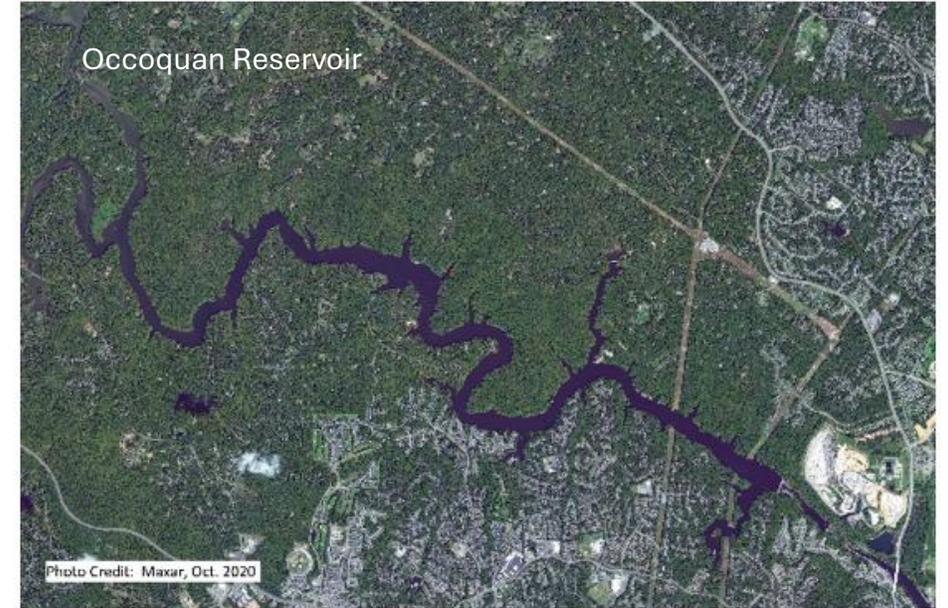
Water Resources

- Occoquan Reservoir

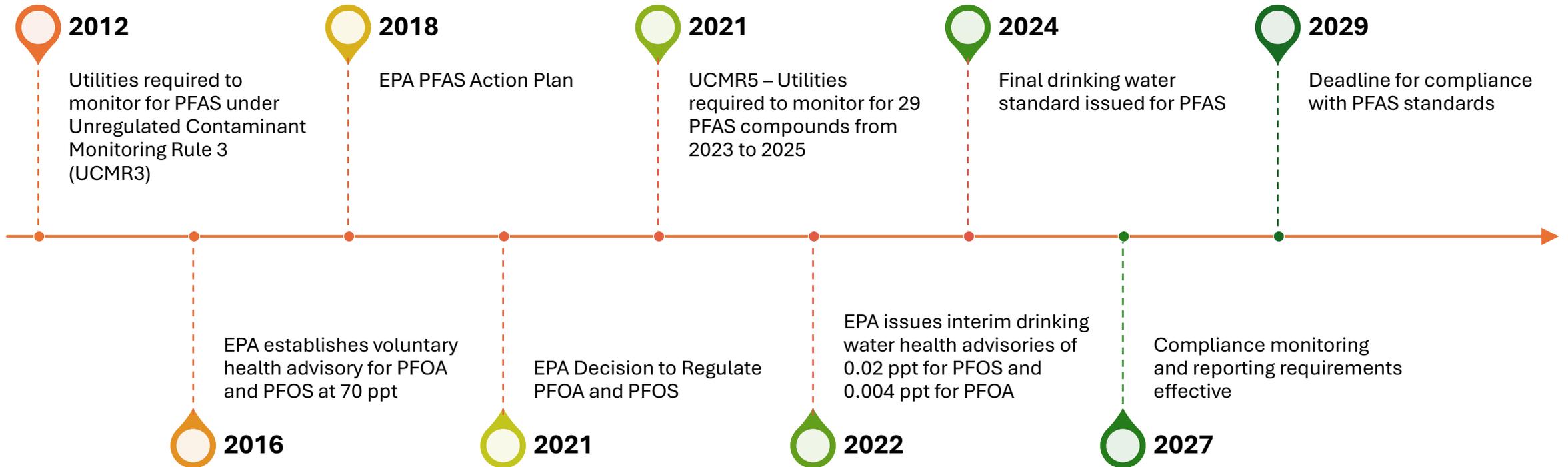
- 600 sq mile multi-jurisdictional watershed
- Indirect potable reuse from UOSA contributes to supply and drought resilience
- Regional programs for water quality monitoring and non-point source water protection

- Potomac River

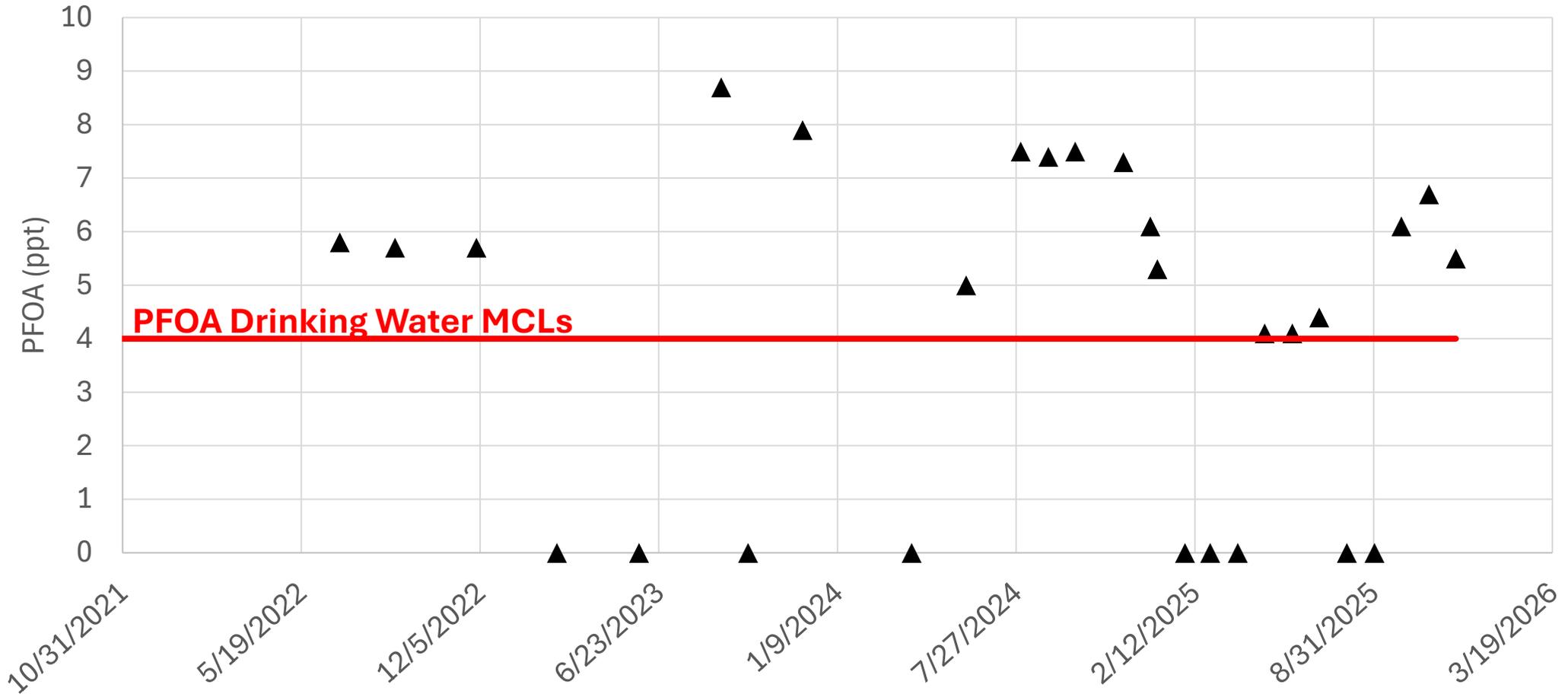
- 9,000 sq mile multi-state watershed
- Shared regional resource
- Key agreements for water supply planning and drought operations
- Source Water Protection Partnership



Drinking Water Regulatory Timeline



PFOA Monitoring Results at Griffith Treatment Plant



Water utilities across the country must meet the new PFAS requirements by 2029.

We are testing various PFAS-removal options to find the most effective one for our drinking water.



Water Treatment

More research is needed to understand how PFAS are getting into our source of drinking water.

We are collaborating with regional partners to learn more about how PFAS travel through the environment so we can stop them at their source.

Research

Water utilities alone cannot solve this problem.

We worked with Delegate Bulova to introduce state legislation to keep PFAS out of our drinking water sources.

Source Water Protection



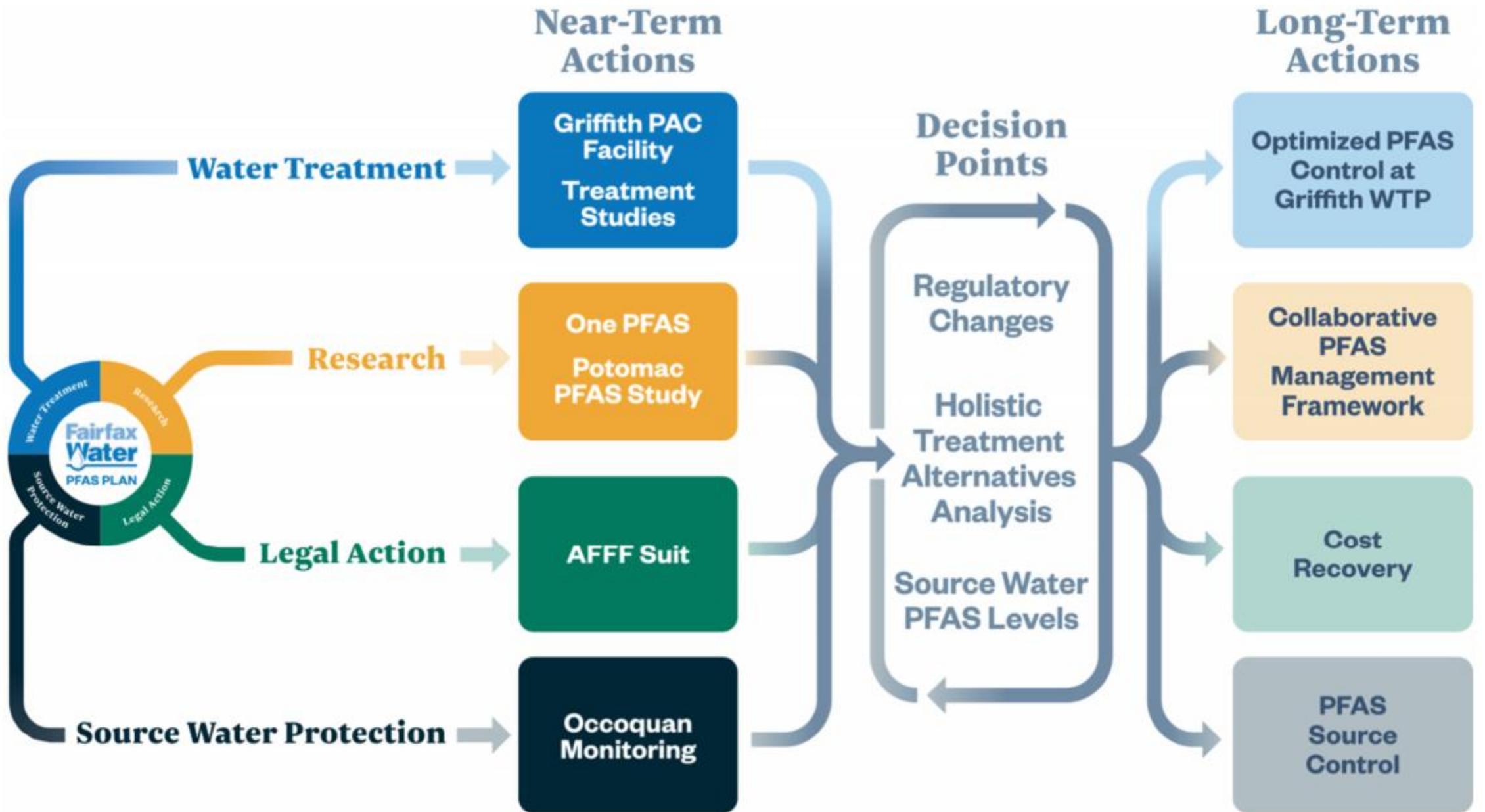
Chemicals used in firefighting foam are partly responsible for PFAS in our source of drinking water.

We filed a lawsuit against the foam manufacturers to hold them responsible, and that case is pending.

Legal Action



Fairfax Water
PFAS PLAN



HB 2050 – Occoquan Reservoir PFAS Reduction Program

Applies to industrial sources discharging (directly or indirectly) into the Occoquan Reservoir

Oct 1
2025

- Facilities must monitor for PFAS using EPA Method 1633 or other approved EPA method
- Results must be reported to VDEQ by the 10th day of the following month.

Jul 1
2027

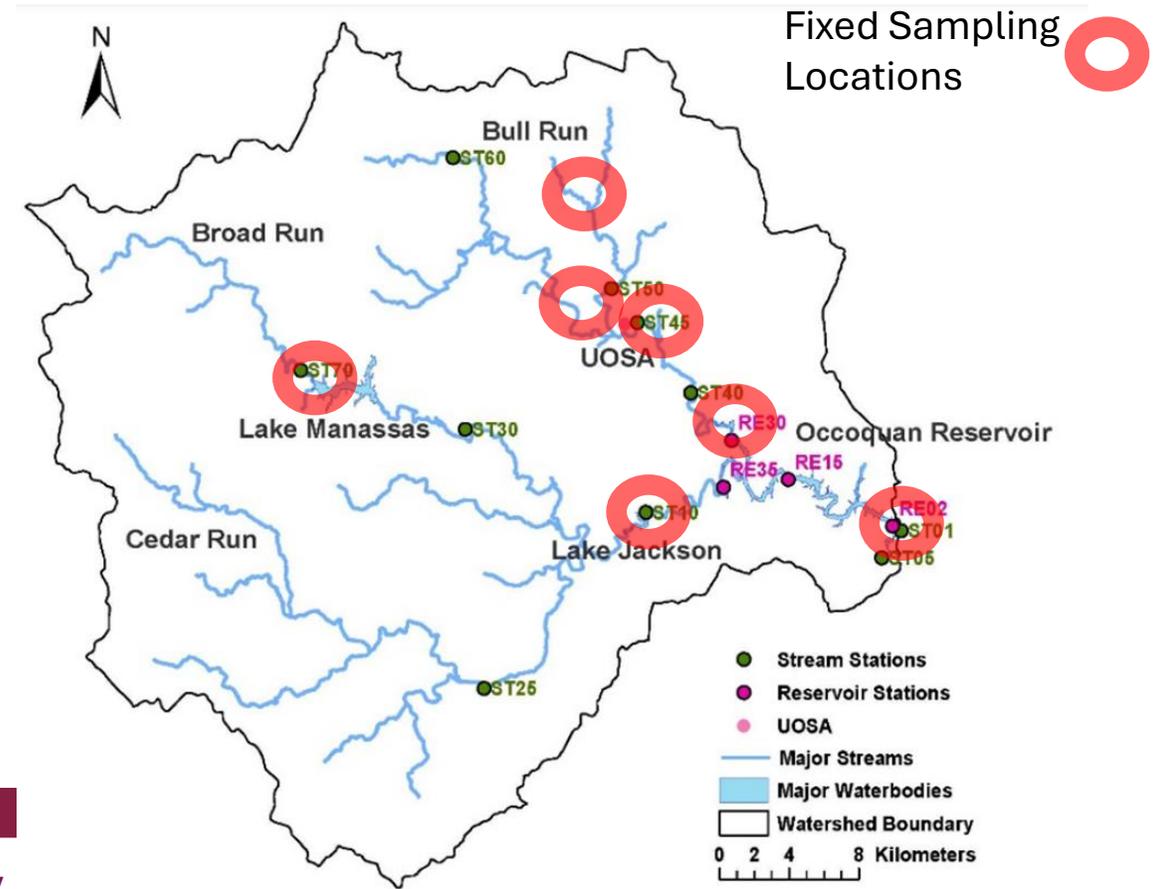
- Modification of the discharge permit to require that the facility's discharge not exceed the MCL.

Jul
2029

- Deadline for compliance with new discharge permit limits.

FW Sponsored Watershed PFAS Monitoring

- Fairfax Water initiated watershed monitoring in January 2024
 - Fixed sites located at long-term Occoquan program sites, with up to 50 years of historical data (flow and wet chemistry)
 - Sampling and analysis by Occoquan Watershed Monitoring Laboratory
 - PFOA and PFOS found above drinking water MCLs in multiple sampling locations at levels several times higher than the drinking water limit
 - **Fixed** and **rotating** sample locations
- Sharing study data with regional partners, and State agencies



OCOCOQUAN WATERSHED MONITORING LABORATORY

Fairfax Water's Goal: Identify and reduce sources of PFAS in the Occoquan and Potomac water supplies to preserve these vital resources for future generations and reduce costs for customers.

Occoquan Watershed PFAS Monitoring

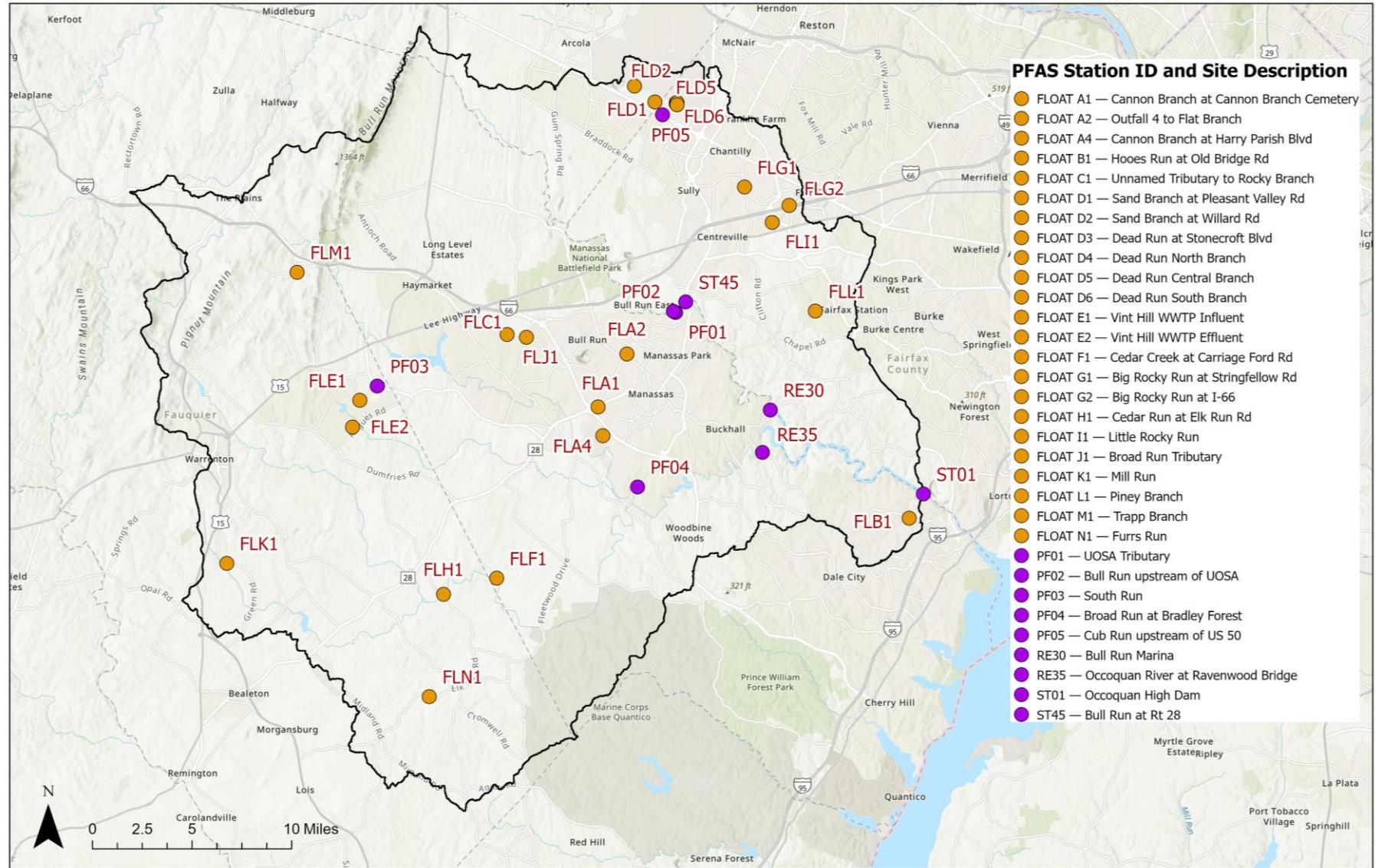
Goal: Identify sources of PFAS entering Griffith Treatment Plant

- 9 Fixed Sites (sampled monthly)
- 20+ Floating Sites (one or more samples)

As of June 2025, total analytes processed = 7,000+

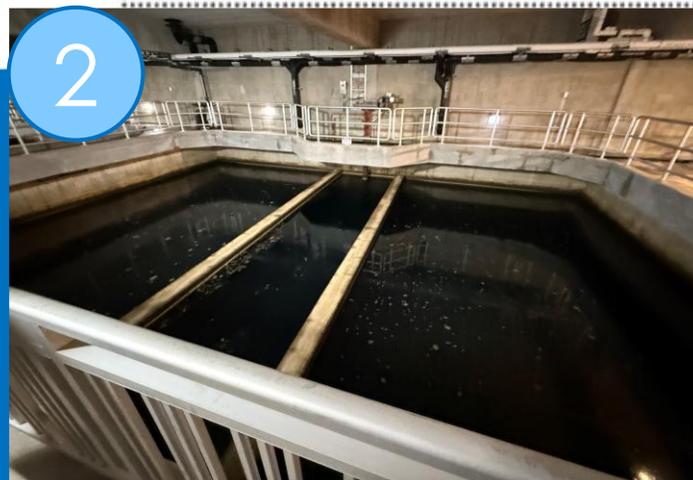
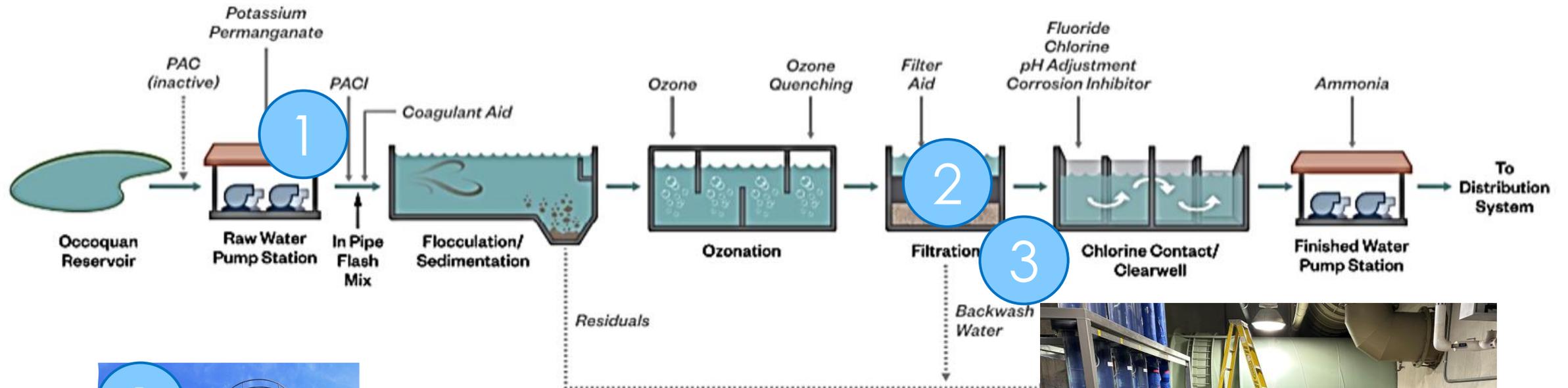


OCCOQUAN WATERSHED MONITORING LABORATORY



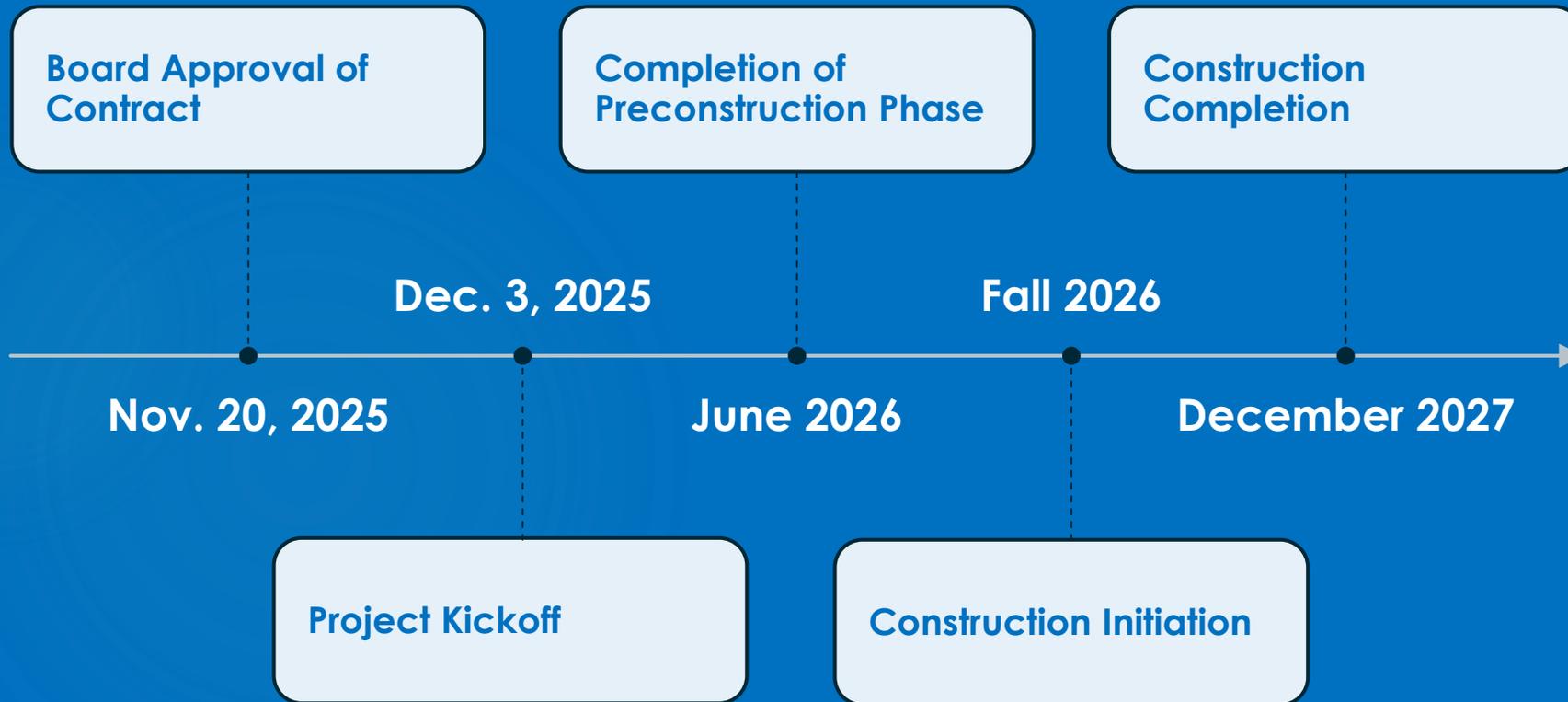


Griffith Treatment Evaluations





Replacement of PAC Feed System



Repurposing of Existing Biofilters

- Existing biofilters are providing removal of organic matter and some taste and odor compounds.
- Design provides less contact time than preferred typically for PFAS.
- Despite design differences, could be leveraged to eliminate/offset substantial PFAS treatment costs
- Key Questions:
 - Under current operations – will PFAS be removed by biofilters?
 - How long will biofilters remove PFAS?
 - Would PFAS-specific media improve PFAS removal performance?



Addition of New PFAS Filter Treatment

Granular Activated Carbon

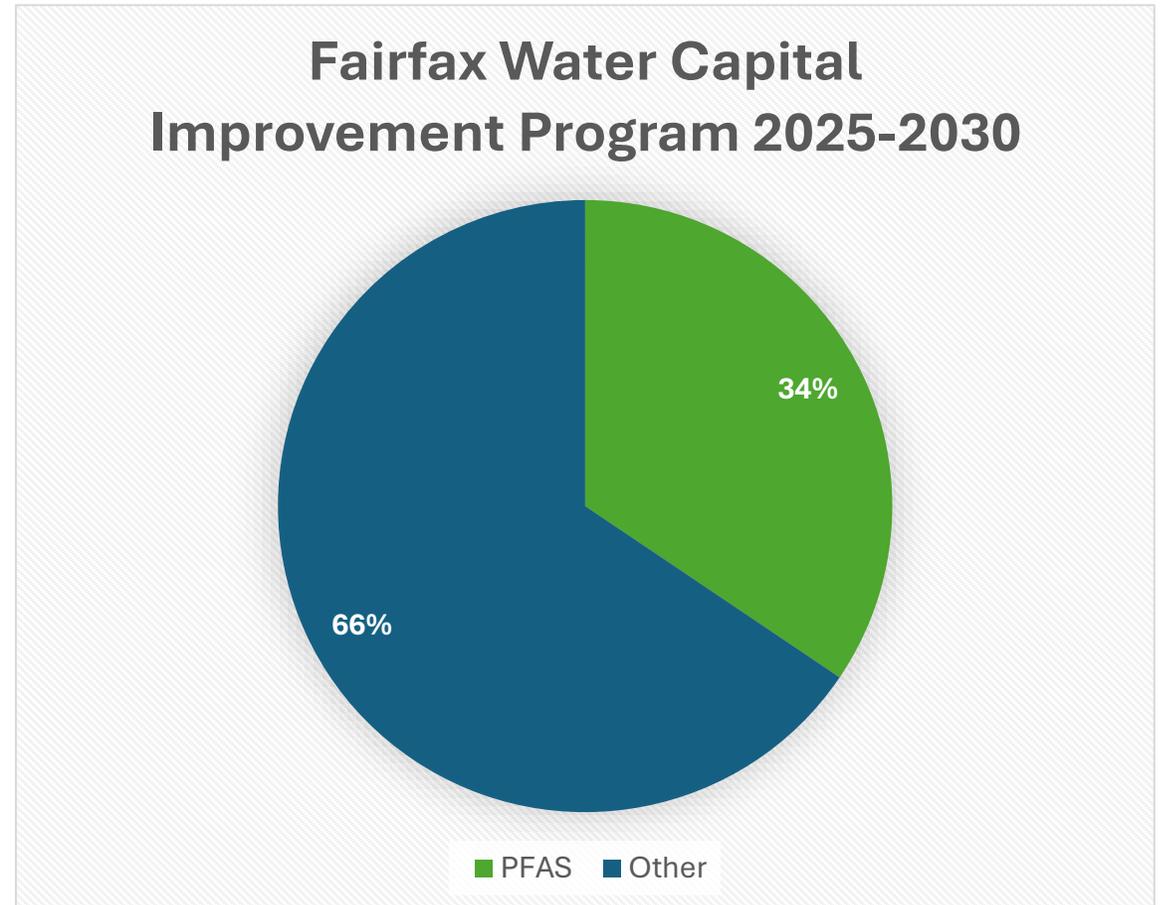


Ion Exchange Resin



Estimated Treatment Cost at Occoquan Plant

- \$389 Million over next 6 years
 - Studies
 - Design and Construction of PFAS Removal Treatment
- Ongoing operations and maintenance expenses (O&M) for PFAS treatment
 - \$24 million annually
 - ≈20% of Fairfax Water's current total O&M expenses

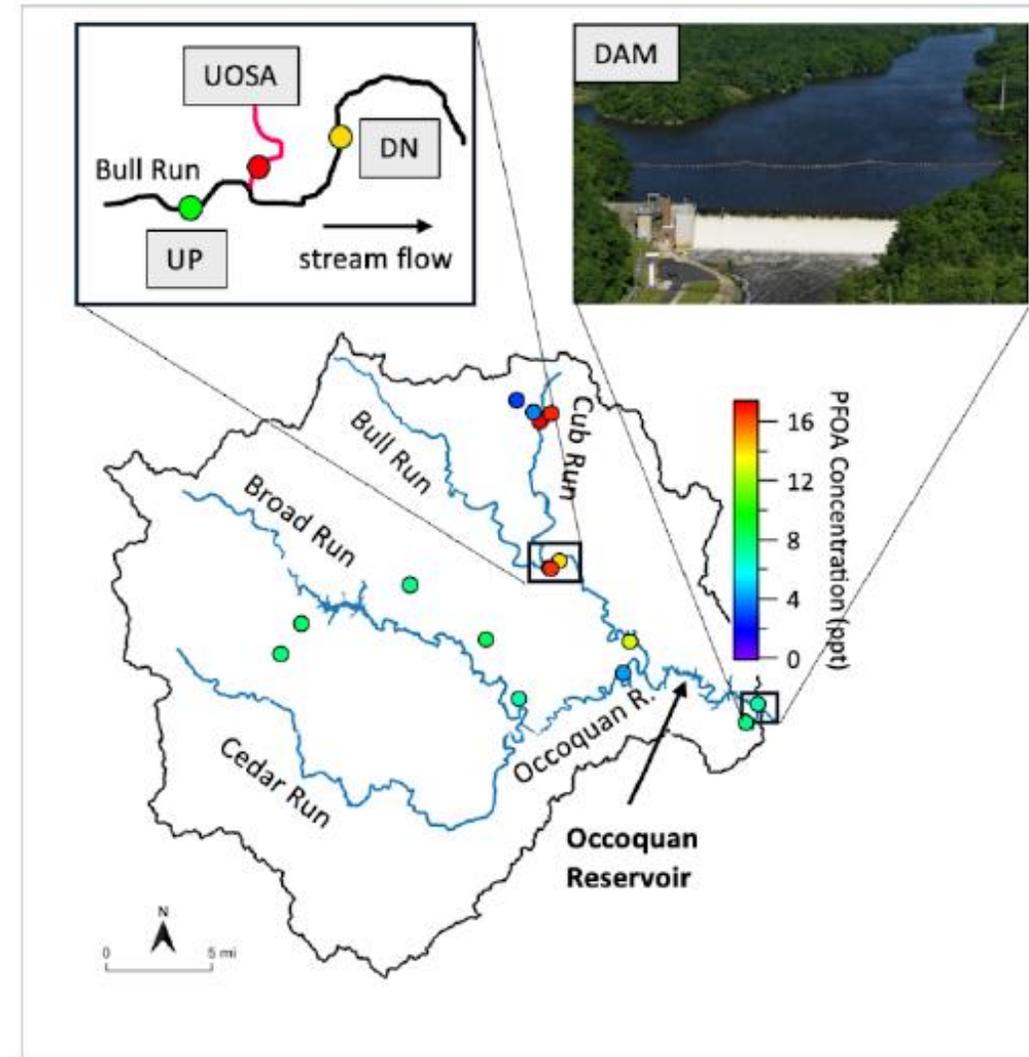


WRF 5345 – One PFAS: A One Water Approach to Managing PFAS Pollution

Goal: Evaluate PFAS interventions to minimize the total costs to customers

- Model PFAS transport to Griffith WTP
- Simulate impact of interventions
- Predict Cost-Benefit

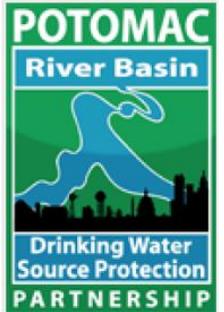
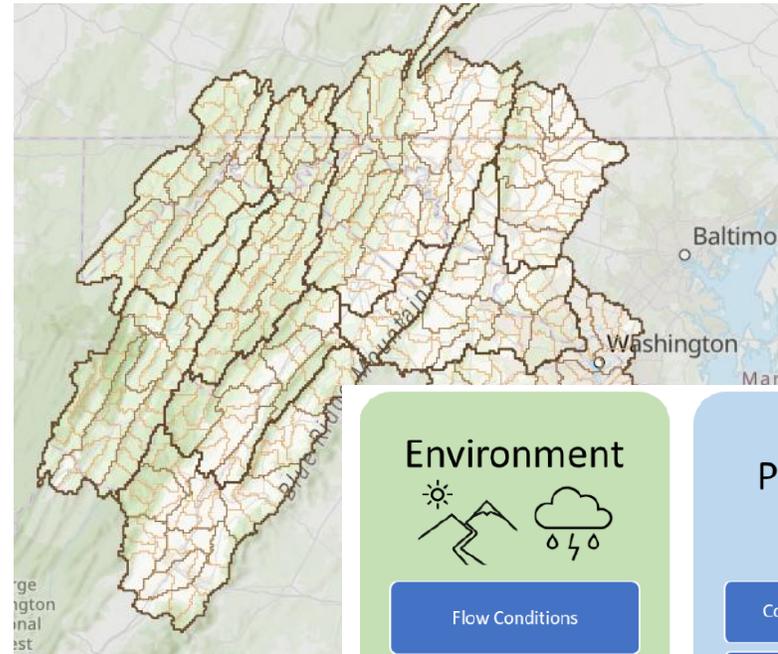
Partners: Virginia Tech, Hazen, Fairfax Water (sponsoring utility), UOSA, Prince William Water, Fairfax County, Prince William County, Loudoun Water, NVRC, FCWSA, Others



WRF 5269 - PFAS Variability in the Potomac River

Goal: Identify the factors affecting the presence and variability of PFAS and precursor compounds in the Potomac River to inform mitigation strategies

- Potomac watershed is >15x larger than Occoquan watershed
- Flows are higher than Occoquan, and so far, PFAS concentrations are lower
- Monthly PFAS sampling (Oct '24-Nov '25)
- 10 sites in Potomac River Basin; 11 sites (outside of WRF)



Environment



Flow Conditions

Climate

Seasonality

Water Quality

Geography

Sample Processing



Collection & Handling

Analysis Procedures

Quality Assurance & Quality Control

Replicates

Sensitivity (Limit of Detection)

Sample Quality (i.e., suspended solids)

PFAS Sources



Mainstem Potomac River vs. Tributaries

Legacy PFAS

Point Sources of Contamination

Non-Point Sources of Contamination

Stormwater

Treated Wastewater Discharge

PFAA Precursors



Utility Partners: Loudoun Water (sponsoring utility), Fairfax Water, WSSC, Leesburg, Hagerstown, DC Water, WA, Frederick Co, Berkely Co, Rockville





Discussion /
Questions?