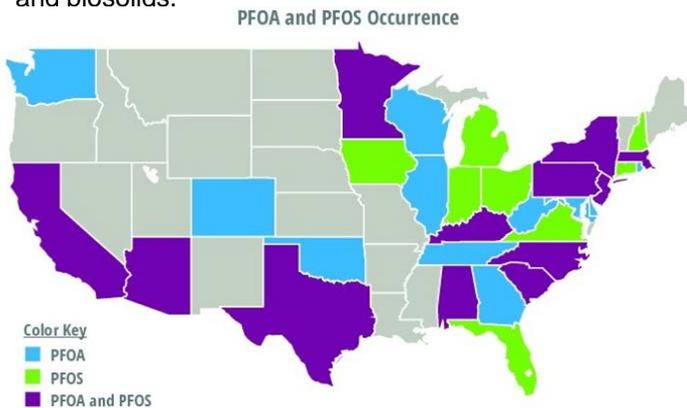


# PFAS Capability

## Treatment and Removal

### PFAS (Per- and Polyfluorinated-Alkyl Substances)

Per- and Polyfluorinated-Alkyl Substances (PFAS) are a class of anthropogenic chemicals containing fluorinated carbons with a charged functional group (usually carboxylic acid or sulfonic acid) that is extremely resistant to degradation. PFAS are water soluble and can be prevalent in ground waters, surface water, wastewater treatment plant discharges and biosolids.



*Source: Map created from data collected by Eurofins Eaton Analytical*

### Regulatory Impacts

Due to the apparent health risks associated with PFAS in drinking waters, US EPA and many state regulatory agencies have either issued health advisories or have regulatory limits for various PFAS compounds. In 2016, EPA issued a lifetime health advisory limit for PFOA and PFOS at 70 parts per trillion, combined or individually. Thousands of variations of PFAS compounds are used in consumer products and industrial processes. The carbon chain length of these various PFAS compounds impacts the performance of treatment technologies. A thorough analysis of the water to be treated is critical.

### Treatment Begins Here: Veolia Solutions

Conventional water and wastewater treatment processes do not effectively remove PFAS. When contamination is first discovered, three important questions need to be considered:

- 1) How are water production/treatment rates maintained in the short term?
- 2) How are treatment options scrutinized for site specific PFAS contaminates?
- 3) How will the contaminated waste from the PFAS treatment system be handled?

Veolia can help answer all of these questions with our wide range of PFAS treatment and management services. First, we look at the entire spectrum of the water quality to ensure compounds known to inhibit PFAS removal technologies are identified, such as organic carbon, bicarbonates, sulfate, nitrate and suspended solids. From there, various short term and long term treatment options will be examined. Identified treatment schemes can first be tested at the bench scale level and further refined at the pilot scale level to help control costs. Once identified, a 20 year life cycle cost analysis can be conducted on the treatment technologies best suited for the application and the end user.

With a collection of quickly deployable mobile treatment systems, along with reverse osmosis and carbon and ion exchange pilot testing skids, Veolia can quickly provide on-site emergency treatment and/or on-site testing to help identify the best path forward.

## Tailored Solutions

### Mobile Services

Veolia maintains a fleet of mobile treatment units that can be deployed to a site for long term or short term emergency treatment. Mobile PFAS treatment units can treat flows from 50 to 1,000 gpm.

Full scale media replacement and disposal services are also available.



### Bench and Pilot Scale Testing

To help identify and scrutinize various PFAS treatment scenarios, Veolia can perform bench scale testing to identify the most feasible and cost effective options prior to any pilot testing activity. Bench scale testing is less expensive and allows for a wide variety of operating configurations to be examined. When the time comes to conduct on-site pilot testing, Veolia can provide low flow (1 – 10 gpm) pilot units that are easily deployed and handled, given their small size.



### Customized Treatment

If your raw water quality requires pretreatment to maximize the effectiveness of the PFAS removal technology, Veolia can provide a variety of pretreatment options allowing for the most cost effective total treatment solution to be determined.

#### Softening Pretreatment

Actina™ Pellet Softening  
IONSOFT™  
Multiflo™ Soft  
ACTIFLO® Soft

#### Pretreatment for Organics / Nitrate / Turbidity Removal

ACTIFLO® & ACTIFLO® Carb  
Filtraflo™ & Filtraflo™ Carb  
Hydrotech Discfilter  
Biological Treatment for Nitrates

#### PFAS Removal

SIRION™ Reverse Osmosis  
Hydrex™ Ion Exchange Resin and GAC  
Filtraflo™ Carbon Filters

### Standardized Solution

#### Ion Exchange, Activated Carbon & RO

Veolia also provides standardized package systems that can be delivered to site as one unit treating flows from 50 to 1,400 gpm



#### PFAS Destruction in Biosolids

BioCon™ Thermal Sludge Drying with ERS

#### Kruger

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