



An Introduction to Per- and Polyfluoroalkyl Substances (PFAS)

Tim Watkins

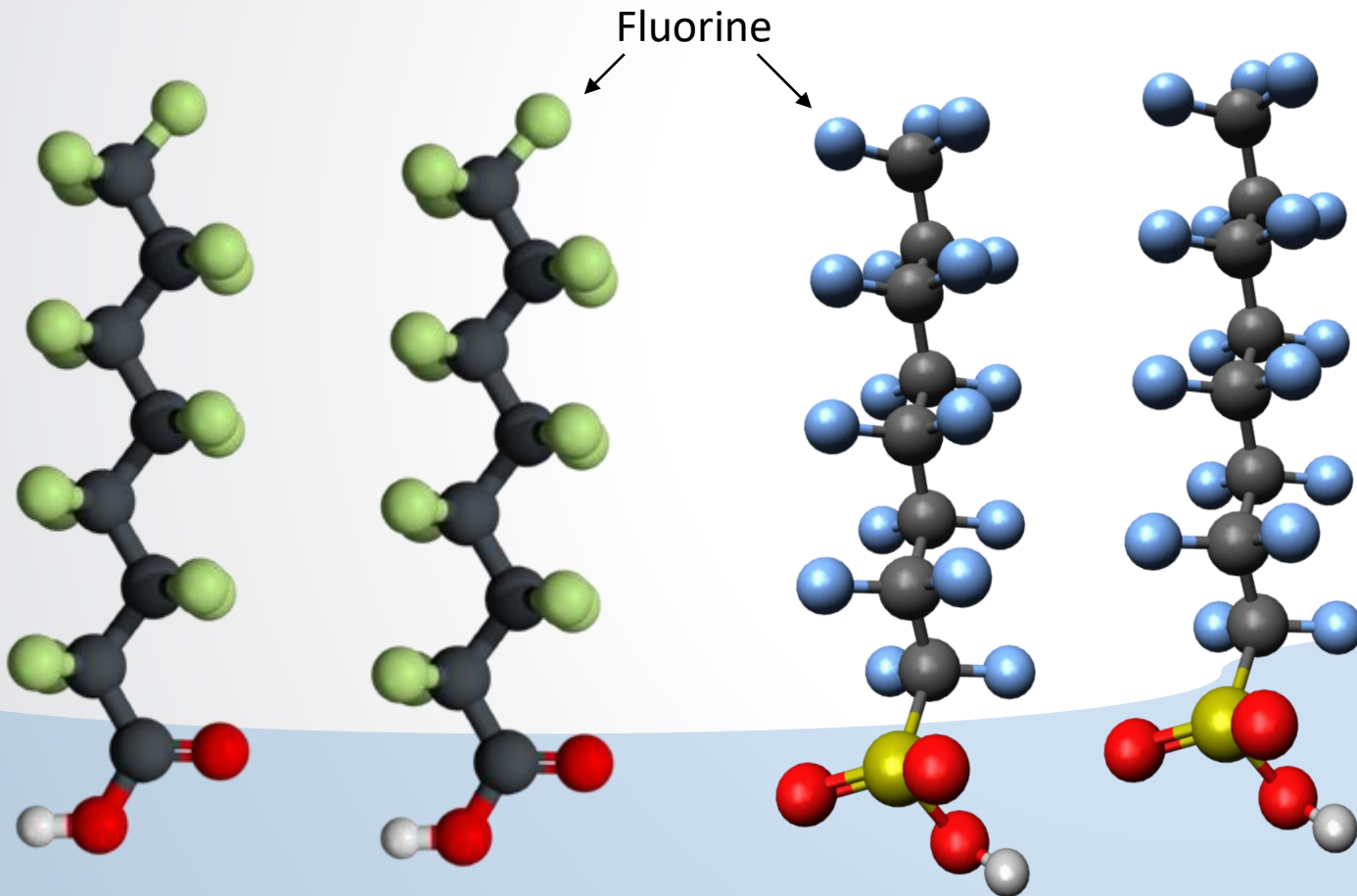
Acting Director, Center for Public Health and Environmental Assessment
U.S. Environmental Protection Agency

Executive Meeting | Board of Scientific Counselors
September 29-30, 2021

What are PFAS?

A class of synthetic chemicals

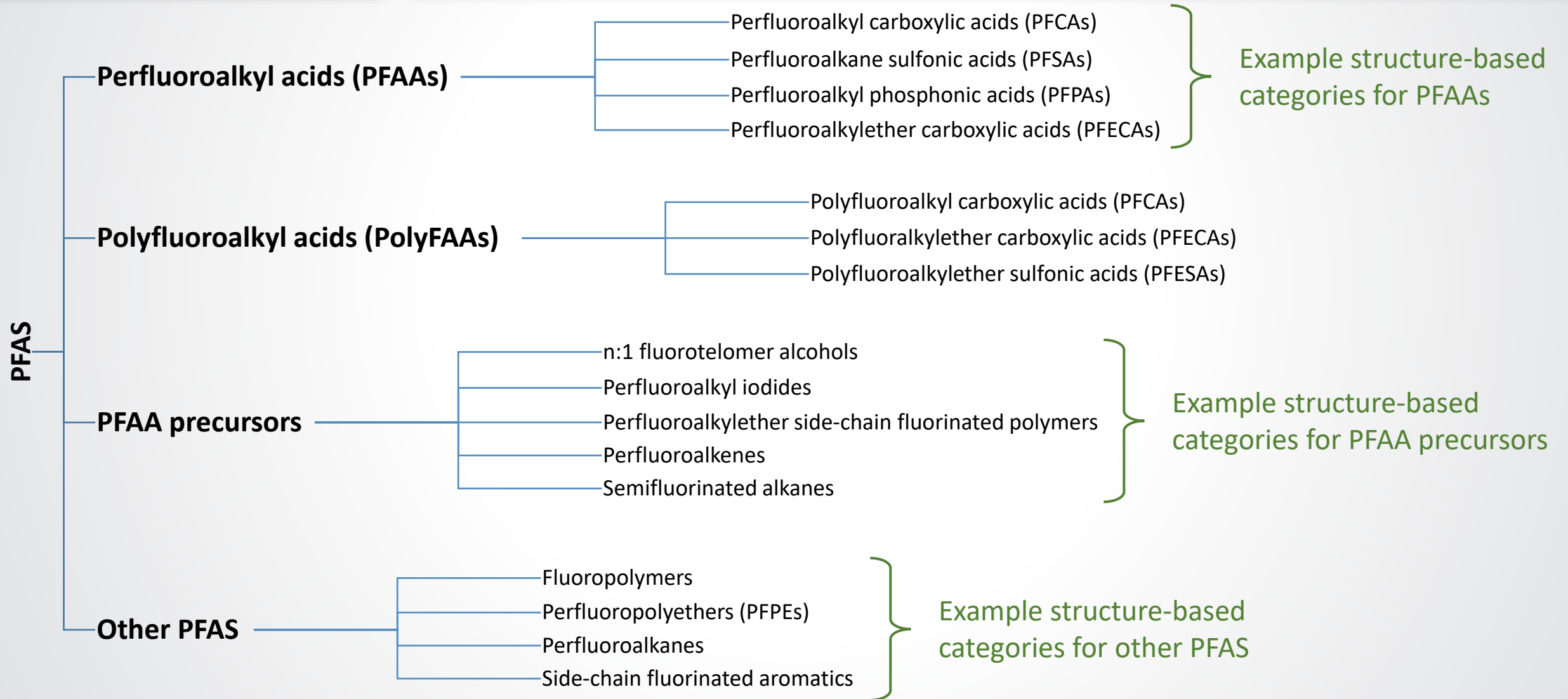
- Chains of carbon (C) atoms surrounded by fluorine (F) atoms
 - Water- and oil-repellent
 - Stable C-F bond
- Some PFAS include oxygen, hydrogen, sulfur and/or nitrogen atoms, creating a water-soluble end



Perfluorooctanoic acid (PFOA)

Perfluorooctanesulfonic acid (PFOS)

More than PFOA and PFOS

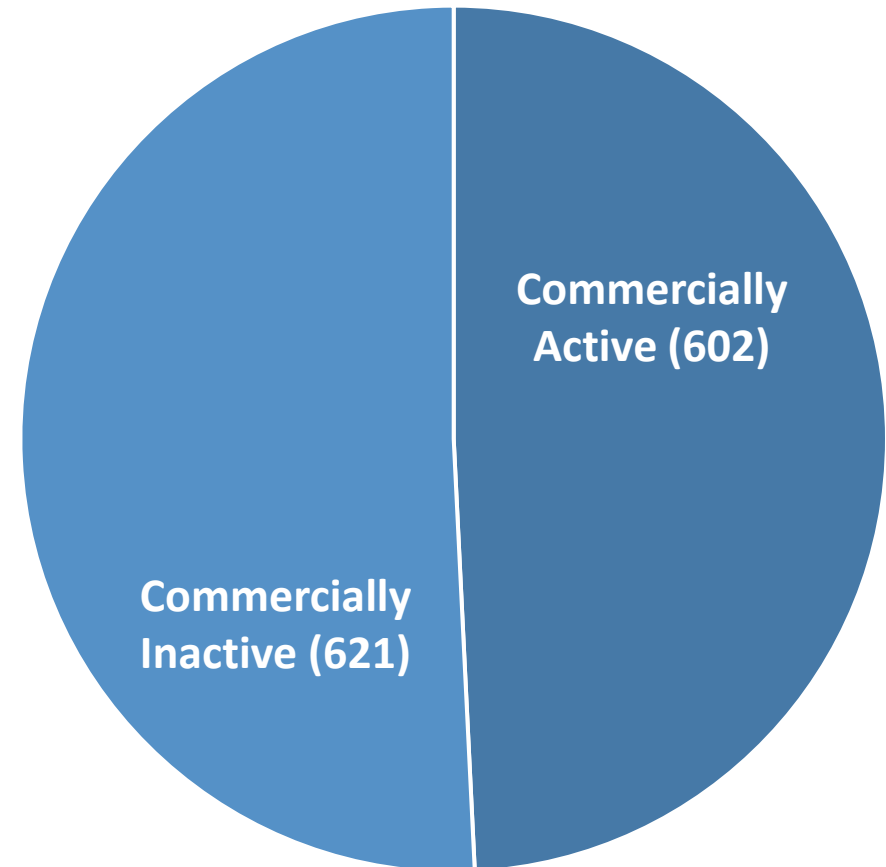




Used in Homes, Businesses & Industry

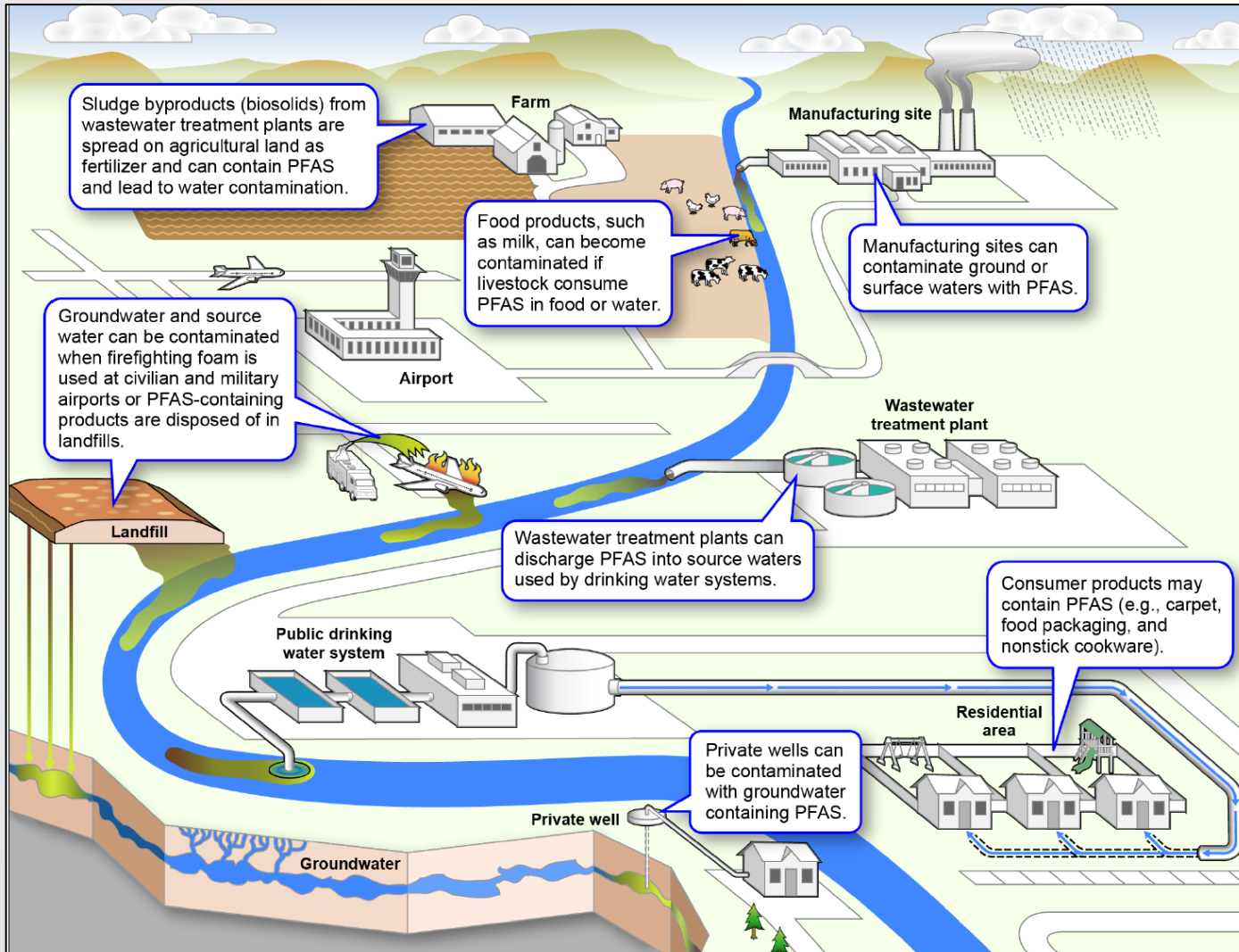
- Food packaging (e.g., pizza boxes, fast food wrappers)
- Waxes and cleaners
- Stain and water repellants for carpets, clothing, upholstered furniture, etc.
- Firefighting foams (AFFF)
- Chemical processing, building/construction, aerospace, electronics, semiconductor, and automotive industries

PFAS on the TSCA Inventory



Adapted from [EPA's PFAS Action Plan](#) (2019)

Sources of PFAS in the Environment



- Direct release into the environment
 - Use of AFFF in training and emergency response
 - Release from industrial facility
- Landfills and leachates from disposal of consumer and industrial products containing PFAS
- Wastewater treatment discharge and biosolids
- Environmental transformation products



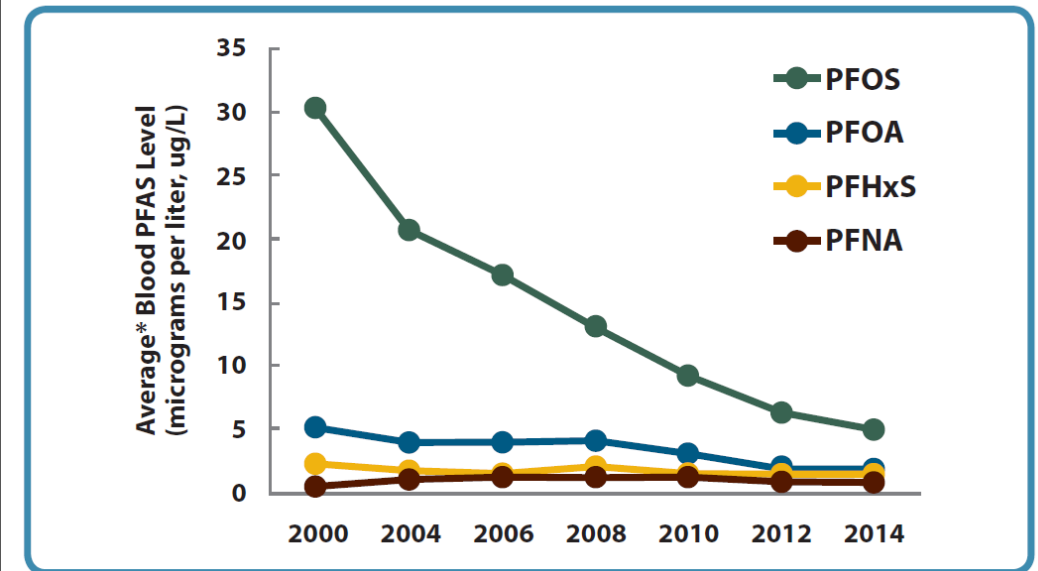
Reasons for Concern

- Known or suspected toxicity, notably for PFOA and PFOS
 - Potential developmental, liver, immune, thyroid effects
- Resist decomposition in the environment and in human bodies
- Most people have been exposed to PFAS

The scope of PFAS contamination in the United States and the potential public health threat makes our task to address these chemicals particularly challenging and urgent.

Memorandum from Administrator Regan

Blood Levels of the Most Common PFAS in People in the United States from 2000-2014



* Average = geometric mean

Data Source: Centers for Disease Control and Prevention. Fourth Report on Human Exposure to Environmental Chemicals, Updated Tables, (January 2017). Atlanta, GA: U.S. Department of Health and Human Services, Centers for Disease Control and Prevention.

https://www.atsdr.cdc.gov/pfas/docs/PFAS_in_People.pdf



Council on PFAS

- Established by Administrator Regan in April 2021
- Charged with:
 - Developing “PFAS 2021-2025: Safeguarding America’s Waters, Air and Land,” a multi-year strategy to deliver critical public health protections to the American public
 - Prioritizing partnerships and collaborations with EPA and with our federal, state, tribal and local partners
 - Continuing to engage with the public about the risk associated with PFAS
- Provided initial recommendations to Administrator Regan and is continuing to work internally on the multi-year strategy



Recent EPA Actions on PFAS

- Announced [plans to revise effluent limitations guidelines](#) for key industries using PFAS (August 2021)
- Released [Draft Method 1633](#), a laboratory method to test for 40 PFAS in wastewater, surface water, groundwater, soil, biosolids, sediment, landfill leachate and fish tissue (August 2021)
- Announced [changes to the New Chemicals Program](#) for reviewing and managing low volume exemption requests for PFAS (April 2021)
- Released [final human health toxicity values for PFBS](#) (April 2021)
- Issued a [final determination to regulate PFOA and PFOS in drinking water](#) (February 2021)
- Proposed the [fifth Unregulated Contaminant Monitoring Rule](#), which would require public water systems to monitor for 29 PFAS in 2023-2025 (February 2021)
- Released [OTM-45](#), a sampling and analysis method for measuring 50 PFAS in air emissions from stationary sources (January 2021)