

Per- and Polyfluoroalkyl Substances (PFAS) and the Fifth Unregulated Contaminants Monitoring Rule (UCMR 5)

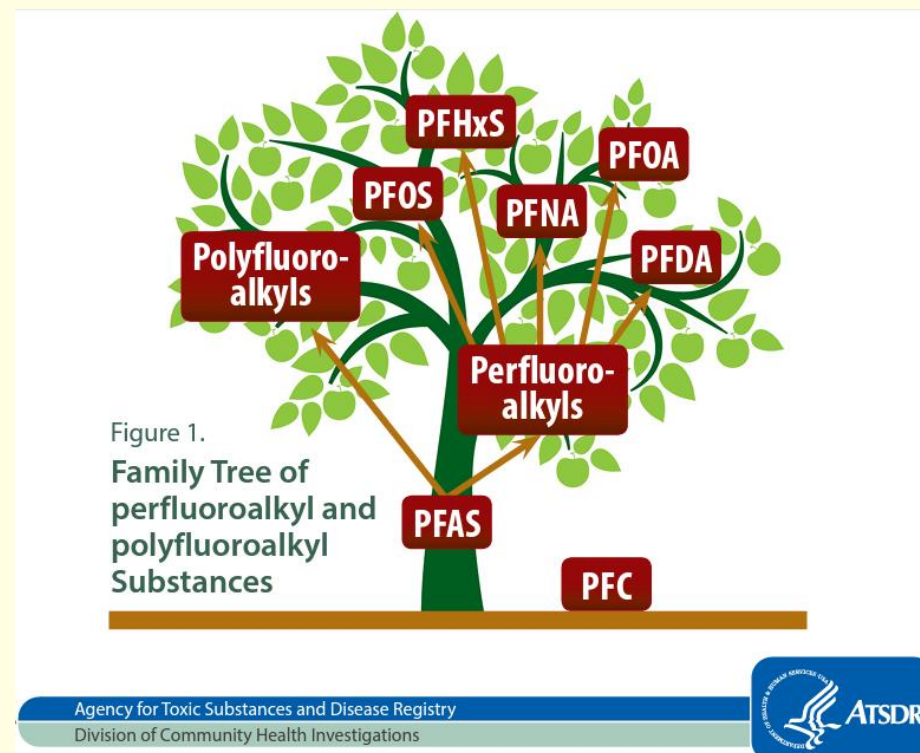
WV AWWA & WV WEA
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Per- and Polyfluoroalkyl Substances (PFAS)

- Commonly referred to as PFAS chemicals
- There are thousands of different PFAS chemicals; two of the most common PFAS chemicals include Perfluorooctanoic Acid (PFOA) and Perfluorooctane Sulfonate (PFOS)
- Group of manufactured chemicals that have been used in industrial and consumer products since the 1940s
- PFOA and PFOS have been replaced in the US by other PFAS chemicals in the recent years
- From 1999-2014, PFOS levels in blood decreased by 80% and PFOA blood levels decreased by 60%



<https://www.atsdr.cdc.gov/pfas/resources/index.html>

Per- and Polyfluoroalkyl Substances (PFAS) – Con't

PFAS can be found everywhere:

- Drinking Water – public water systems and private water wells
- Soil – landfills and hazardous waste sites
- Fire Extinguishing Foam (Aqueous film-forming foams or AFFF) – training/emergency response events at airports and military bases
- Manufacturing and Chemical Production – electronics and paper manufacturing



PFAS Investigation & Management Program. 2022. *What are PFAS?*.
<<https://defence.gov.au/environment/pfas/PFAS.asp>>

Per- and Polyfluoroalkyl Substances (PFAS) Con't

- Food – fish and dairy products (animals exposed to PFAS)
- Food Packaging – pizza boxes, fast food containers, grease resistant paper
- Household Products – stain and water-repellents, non-stick cookware, paints, sealants
- Personal Care Products – shampoo, dental floss, cosmetics
- Biosolids – fertilizer from wastewater treatment plants

Per- and Polyfluoroalkyl Substances (PFAS) Con't

Concerns:

- PFAS chemicals build up in people, animals and the environment over time
- PFAS chemicals persist in the environment, breaking down very slowly – leading to them being called “forever” chemicals
- Due to widespread production and use, studies show most people have some exposure to PFAS

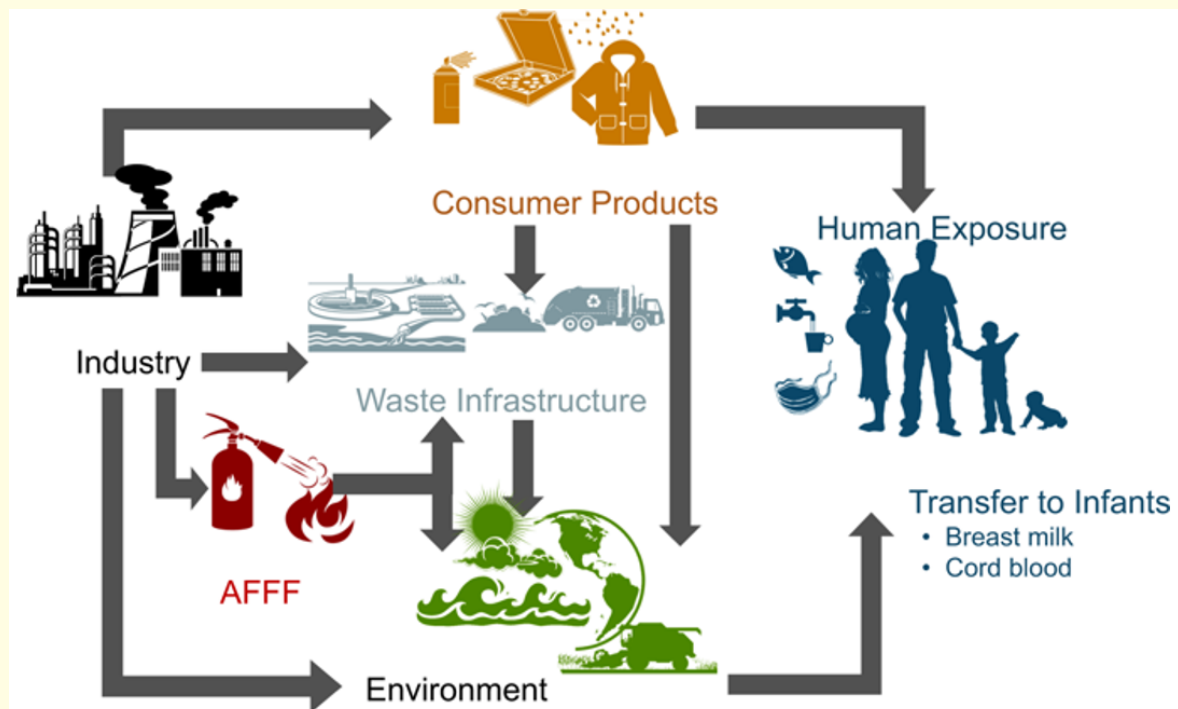


Figure 1 from Sunderland et al. (2019) *Journal of Exposure Science & Environmental Epidemiology* 29(2). doi:10.1038/s41370-018-0094-1

<https://nature.com/articles/s41370-018-0094-1>

Depending on exposure levels, PFAS may have adverse health effects including:

- Reproductive effects
- Developmental effects or delays
- Increased risk of some cancers
- Reduced ability of the body's immune system
- Interference with the body's natural hormones
- Increased cholesterol and/or risk of obesity

Additional health effects are difficult to determine for various reasons:

- Thousands of different PFAS chemicals
- Exposure happens in different ways and at different stages in life
- Types and uses of PFAS has changed over time

Public water systems initially tested for certain PFAS chemicals under the Third Unregulated Contaminants Monitoring Rule (UCMR 3)

- Required certain public water systems to sample for 28 chemicals and 2 viruses
- Included 6 PFAS chemicals
 - PFOS
 - PFOA
 - Perfluorobutanesulfonic acid (PFBS)
 - Perfluorohexanesulfonic acid (PFHxS)
 - Perfluoroheptanoic acid (PFHpA)
 - Perfluorononanoic acid (PFNA)
- Sampling occurred between 2013 and 2015

UCMR 3 West Virginia Results:

- Martinsburg (Berkeley County) – Detectable levels of PFHxS and PFOS
- Parkersburg (Wood County) – Detectable levels of PFOA
- Vienna (Wood County) – Detectable levels of PFHpA, PFHxS, and PFOA
- Results were not above the US Environmental Protection Agency (EPA) health advisory at that time (PFOS – 0.2 parts per billion and PFOA – 0.4 parts per billion)
- **In 2016, EPA lowered the health advisory for PFOS and PFOA to 70 parts per trillion (ppt), either individually or combined**
- This lower health advisory level triggered Martinsburg and Vienna public water systems to install treatment

West Virginia PFAS Study:

- In February 2020, WV Senate Concurrent Resolution 46 required the West Virginia Department of Health and Human Resources (DHHR) and West Virginia Department of Environmental Protection (DEP) to initiate a public water supply study for PFAS
- In July 2020, DHHR and DEP signed a 2-year contract with the United States Geological Survey (USGS) to conduct a study on PFAS in West Virginia source waters
- Purpose of the study was to identify the source water supplies in West Virginia that had measurable amounts of PFOS, PFOA and other related PFAS compounds (only raw source water for 252 community public water systems and 27 schools were tested)
- Preliminary results show 37 sample sites had some level of a PFAS component detected
- Official results and report expected to be released Summer 2022
- DHHR signed a second contract with USGS beginning April 2022 to sample the finished (treated) water at each of the 37 public water systems with detections in their source water

In 2021, EPA released the PFAS Strategic Roadmap which outlines their plan to address PFAS

- **Research:** Includes investing in ways to improve the understanding of PFAS exposure and toxicity, human health effects, and environmental implications; working to develop effective and innovative scientific solutions
- **Restrict:** Pursuit of proactive approaches to prevent PFAS from entering air, soil, and water at levels that have adverse effects on human health or the environment
- **Remediate:** Protect human health and the environment by expanding the scope and speed of PFAS contamination cleanup.

The Fifth Unregulated Contaminant Monitoring Rule (UCMR 5) was also finalized in 2021

EPA anticipates releasing a proposed PFAS regulation in Fall 2022 with a final regulation to be released in Fall 2023

Fifth Unregulated Contaminant Monitoring Rule (UCMR 5)

- The Safe Drinking Water Act requires that once every five years EPA issue a list of unregulated contaminants to be monitored by public water systems
- Sampling required between January 2023 and December 2025
- UCMR 5 consists of 29 PFAS chemicals and Lithium

Twenty-five Per- and Polyfluoroalkyl Substances (PFAS) using EPA Method 533 (SPE LC/MS/MS):¹

11-chloroeicosafuoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS)	perfluorodecanoic acid (PFDA).
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	perfluorododecanoic acid (PFDoA).
1H, 1H, 2H, 2H-perfluorohexane sulfonic acid (4:2 FTS)	perfluoroheptanesulfonic acid (PFHpS).
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	perfluoroheptanoic acid (PFHpA).
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	perfluorohexanesulfonic acid (PFHxS).
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	perfluorohexanoic acid (PFHxA).
hexafluoropropylene oxide dimer acid (HFPO-DA) (GenX)	perfluorononanoic acid (PFNA).
nonafluoro-3,6-dioxaheptanoic acid (NFDHA)	perfluorooctanesulfonic acid (PFOS).
perfluoro (2-ethoxyethane) sulfonic acid (PFEEESA)	perfluorooctanoic acid (PFOA).
perfluoro-3-methoxypropanoic acid (PFMPA)	perfluoropentanesulfonic acid (PFPeS).
perfluoro-4-methoxybutanoic acid (PFMBA)	perfluoropentanoic acid (PFPeA).
perfluorobutanesulfonic acid (PFBS)	perfluoroundecanoic acid (PFUnA).
perfluorobutanoic acid (PFBA).	

Four Per- and Polyfluoroalkyl Substances (PFAS) using EPA Method 537.1 (SPE LC/MS/MS):²

n-ethyl perfluorooctanesulfonamidoacetic acid (NEtFOSAA)	perfluorotetradecanoic acid (PFTA).
n-methyl perfluorooctanesulfonamidoacetic acid (NMeFOSAA)	perfluorotridecanoic acid (PFTTrDA).

One Metal/Pharmaceutical using EPA Method 200.7 (ICP-AES)³ or alternate SM⁴ or ASTM:⁵

lithium.

- Previous UCMR sampling required all systems with a population greater than 10,000 and a select number of system less than 10,000 to sample
- **America's Water Infrastructure Act of 2018 now requires ALL public water systems with a population between 3,300 and 10,000 to also sample and a representative number of systems below 3,300 will also be required to sample**
- EPA covers the cost of sampling for public water systems with a population less than 10,000
- Public water systems with a population greater than 10,000 must pay for their own sampling

- Previously, DHHR collected the samples for the selected public water systems with a population less than 10,000
- With the change in population, DHHR has committed to collecting samples for public water systems with a population less than 5,000
- **Therefore, ALL public water systems with population between 5,000 and 10,000 will now have to collect their own sample. EPA is still committed to covering the cost of the sample**
- Public water systems with population between 5,000 and 10,000 must create an account on the EPA's CDX portal for UCMR and verify their information as well as provide shipping information for the sampling kits

Fifth Unregulated Contaminant Monitoring Rule (UCMR 5) Con't

- UCMR 5 samples will be collected at the entry point to the distribution system (after treatment)
- All samples must be analyzed by a laboratory approved by the EPA to conduct UCMR 5 analyses
- Sampling frequency and timing

Water Source	Timeframe	Sampling Frequency
Surface water, ground water under the direct influence of surface water, or mixed sources systems	Year-Round	Systems must monitor 4 times during a consecutive 12-month monitoring period. Sample events must occur 3 months apart.
Ground water systems	Year-Round	Systems must monitor 2 times during a consecutive 12-month monitoring period. Sample events must occur 5-7 months apart.

EPA. UCMR 5 Program Overview Fact Sheet (pdf) (December 2021, EPA 815-F-21-009)

UCMR 5 Reporting Requirements:

- The public notification rule requires all systems to notify consumers of the availability of the UCMR results no later than 12 months after the results are known
 - Notifications must meet all requirements of the public notice rule including direct mailing of the notice along with a second method approved to reach additional consumers including non-bill paying customers
- Community water systems are also required to report UCMR results in their annual Consumer Confidence Report (CCR) when unregulated contaminants are detected
 - The CCR must report the average of the year's monitoring results and the range of detections

References and Useful Links

EPA - Research on Per- and Polyfluoroalkyl Substances (PFAS)

<https://www.epa.gov/chemical-research/research-and-polyfluoroalkyl-substances-pfas>

EPA – Drinking Water Health Advisories for PFOA and PFOS

<https://www.epa.gov/ground-water-and-drinking-water/drinking-water-health-advisories-pfoa-and-pfos>

EPA – PFAS Strategic Roadmap: EPA's Commitments to Action 2021-2024

<https://www.epa.gov/pfas/pfas-strategic-roadmap-epas-commitments-action-2021-2024>

EPA - Fifth Unregulated Contaminant Monitoring Rule

<https://www.epa.gov/dwucmr/fifth-unregulated-contaminant-monitoring-rule>

EPA - The Fifth Unregulated Contaminant Monitoring Rule (UCMR 5) : Program Overview Fact Sheet (December 2021, EPA 815-F-21-009)

EPA - Revisions to the Unregulated Contaminant Monitoring Rule (UCMR 5) for Public Water Systems and Announcement of Public Meetings [EPA–HQ–OW–2020–0530; FRL–6791–03–OW], RIN 2040–AF89

ATSDR - Per- and Polyfluoroalkyl Substances (PFAS) and Your Health

<https://www.atsdr.cdc.gov/pfas/resources/index.html>

Code of Federal Regulations – Title 40: PART 141 - NATIONAL PRIMARY DRINKING WATER REGULATIONS

<https://www.ecfr.gov/current/title-40/chapter-I/subchapter-D/part-141>

Subpart E - Special Regulations, Including Monitoring 141.40

Subpart O - Consumer Confidence Reports 141.153

Subpart D - Reporting and Recordkeeping 141.35

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