Per- and Polyfluoroalkyl Substances (PFAS) Update

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Overview of Potential PFAS Universe

- Industries:
  - Metal plating
  - Plastic and textile coatings
  - Chemical and plastics manufacturing
  - Electronics manufacturing
  - Car washes
- Waste disposal
  - Unlined landfills
  - land with biosolids application
- AFFF users:
  - Airports, train yards, etc.
  - Fire training areas
  - Chemical plants and petroleum refineries

PFAS Releases

- Contamination sources and routes vary
  - AFFF usage, testing, storage – groundwater, soil, wastewater
  - Biosolids application – soil to groundwater
  - Landfills – leachate to groundwater or wastewater
  - Manufacturing – wastewater and air deposition

PFAS Found at Superfund Sites

- Perfluorocarboxylic acids C4-14
  - PFNA, PFOA, PFHpA, and PFHxA most common
- Perfluorosulfonic acids C4-10
  - PFOS, PFHxS, and PFBS most common
- FtS 4:2, 6:2, 8:2 (8:2 and 6:2 more common)
- PFOSA
- NEtFOSAA
- NMeFOSAA
- HFPO-DA and DONA (1 site)
- PFAS found skewed by which PFAS analyzed

Toxicity Values and Health Advisories

- Office of Water (OW) Reference doses (RfD) for PFOA and PFOS are 2×10^{-5} mg/kg/d
  - Lifetime Drinking Water Health Advisory (HA) is 70 ppt for both
  - HA is based on sum of both PFOA and PFOS concentration
- OW Oral Slope Factor of 0.07 $(mg/kg\text{-}day)^{-1}$ for PFOA, but RfD is risk driver
- PPRTV RfD for PFBS is 2×10^{-2} mg/kg/d

Toxicity Values in Progress

- Draft ATSDR MRL for PFOA, PFOS, PFNA, and PFHxS
- Draft EPA updated PFBS and new HFPO-DA (GenX) toxicity assessment were released for public comment; currently being finalized
- EPA IRIS Assessments are underway for PFBA, PFHxS, PFHxA, PFDA, and PFNA

State Toxicity and Risk Values

- 7 states have developed their own toxicity values
  - CA, MI, MN, NC, NH, NJ, TX
  - PFNA, PFOA, PFHxA, PFBA, PFOS, PFHxS, PFBS, HFPO-DA
  - TX also has values for PFTetDA, PFTriDA, PFDoDA, PFUDA, PFDA, PFHpA, PFPeA, PFDS, PFOSA
- 24 states have set regulatory, advisory, or guidance values
  - In many cases, this is adoption of EPA's HAs
  - A few states have set MCLs
  - ITRC keeps up to date information

Current Analysis Methods

- Method 537.1 for 18 PFAS in drinking water
- Method 533 for 25 PFAS in drinking water
- Method 537.1 and 533 overlap for 14 PFAS
- ASTM Method 7979 single-lab validated for PFAS in non-potable waters using direct inject
- ASTM Method 7968 single-lab validated for PFAS in soils using direct inject

Analysis Methods in Progress

- SW846-8327 direct inject method for 24 PFAS in non-potable waters
  - Multi-lab validated
  - Was open for public comment
  - Final method expected in fall 2020
- OW working with DOD, with OLEM participation, for multi-lab validation of an isotopic dilution method for PFAS

PFOA/PFOS in Groundwater Recommendations

- "Interim Recommendations for Addressing Groundwater Contaminated with PFOA and PFOS" issued Dec. 2019 by EPA
- Screen PFOA and PFOS at HQ = 0.1 (currently 40 ng/l)
- Use Health Advisory of 70 ng/l as PRG

PFOA/PFOS Hazard Substance Designation

- EPA continues moving forward with the regulatory process for proposing to designate PFOA and PFOS as hazardous substances under CERCLA.

Drinking Water Monitoring

- Unregulated Contaminant Monitoring Rule 5 (UCMR 5) was sent to OMB for interagency review in July 2020
- EPA anticipates proposing nationwide drinking water monitoring for PFAS under UCMR 5 utilizing Method 537.1 and 533
- Monitoring can be performed at lower concentrations than previously possible
- Monitoring anticipated January 2023 through December 2025