EMERGING CONTAMINANTS OF CONCERN:

NEW AND PENDING REGULATIONS FACING WATER AND WASTEWATER UTILITIES

MARCH 6, 2025

Trinity River Authority of Texas
Enriching the Trinity basin as a resource for Texans

Background on Emerging Contaminants of Concern

Background

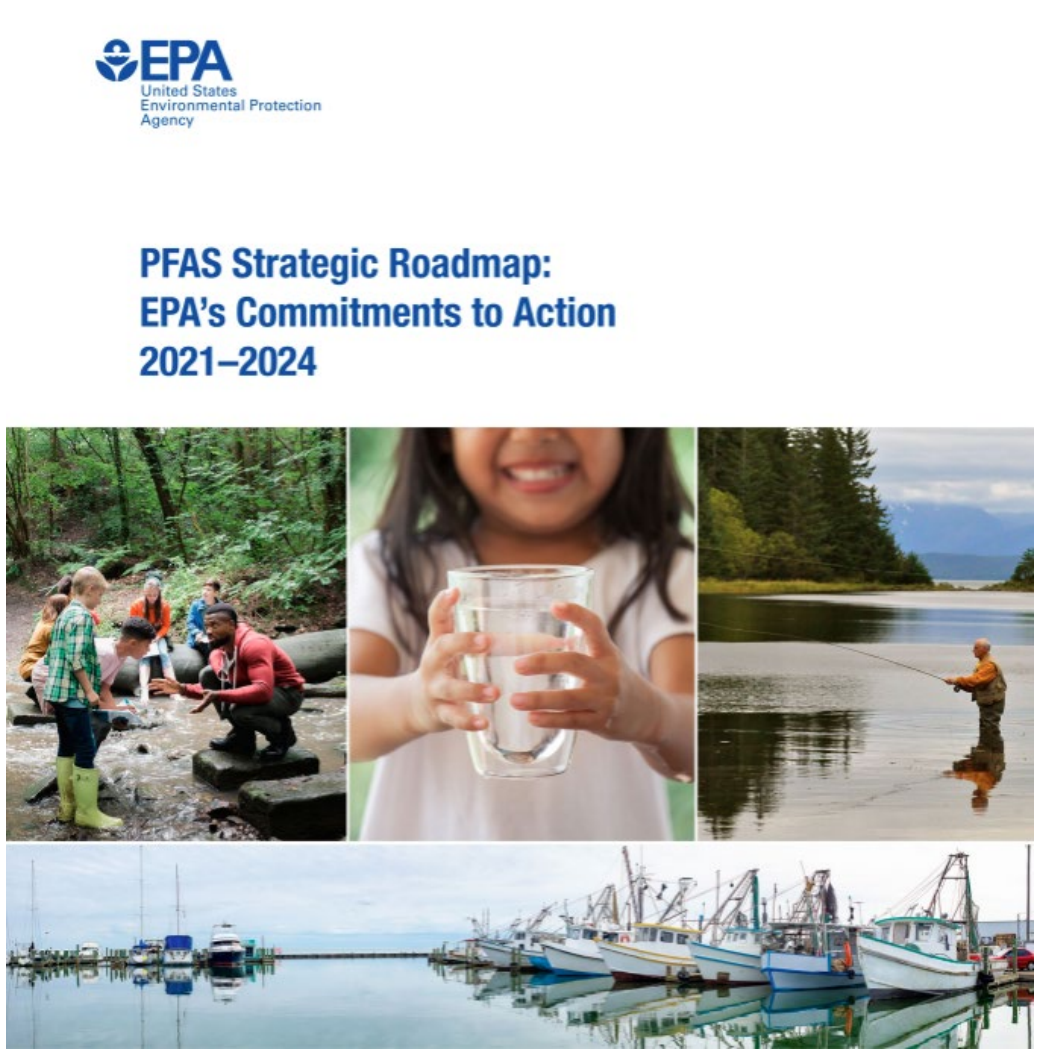
- Not to be confused with Contaminants of Emerging Concern (CECs) of the early 2000's
  - Chemicals and substances that may harm human health or the environment
  - Much less likely to be able to control in reality

What are we talking about then?

Background

Per- and Polyfluoroalkyl Substances (PFAS)

Background



- Released in October 2021
  - Outlined the EPA strategy for addressing PFAS
  - Indicated specific action items
  - Identified tentative timelines

Background

- Bad Boys of PFAS
  - PFOA and PFOS
- Are there other PFAS compounds of concern?
  - Depends on who is asking
  - Where you are looking at
  - What you are looking in

Background

Concentration Expressions	Abbreviations	Equivalents
Part Per Million	ppm	mg/L or mg/kg or µg/g
Parts Per Billion	ppb	µg/L or µg/kg or ng/g
Parts Per Trillion	ppt	ng/L or ng/kg or pg/g

- How do we measure it?
  - With great difficulty
  - Drinking Water is only “approved” method
  - Wastewater/Solids Method is final but not “approved”

Drinking Water

Drinking Water

- UCMR 3 in May 2012
  - All PWS serving 10,000+
  - Monitoring 2013-2015
- UCMR 5 in December 2021
  - All PWS serving 3,300 or more
  - Monitoring 2023-2025

UCMR 3 Contaminant List			
Assessment Monitoring (List 1 Contaminants)			
1,2,3-trichloropropane	bromomethane (methyl bromide)	chloromethane (methyl chloride)	bromochloromethane (Halon 1011)
chlorodifluoromethane (HCFC-22)	1,3-butadiene	1,1-dichloroethane	1,4-dioxane
vanadium	molybdenum	cobalt	strontium
chromium[1]	chromium-6[2]	chlorate	perfluorooctanesulfonic acid (PFOS)
perfluorooctanoic acid (PFOA)	perfluorobutanesulfonic acid (PFBS)	perfluorohexanesulfonic acid (PFHxS)	perfluoroheptanoic acid (PFHpA)
perfluorononanoic acid (PFNA)			
Screening Survey (List 2 Contaminants)			
17-β-estradiol	estriol	estrone	4-androstene-3,17-dione
17-α-ethynylestradiol	equilin	testosterone	
Pre-Screen Testing[3] (List 3 Contaminants)			
enteroviruses	noroviruses		

Drinking Water

Pollutant	MCL	PQL	Unit
PFOA	4.0	4.0	ng/L
PFOS	4.0	4.0	ng/L
PFHxS	10.0	3.0	ng/L
PFNA	10.0	4.0	ng/L
HFPO-DA (GenX Chemicals)	10.0	5.0	ng/L
PFBS	N/A	3.0	ng/L
Hazard Index	1	N/A	Unitless

- Proposed NPDWR March 2023
  - 120,000 comments
- Final NPDWR April 2024
  - Promulgated in the Federal Register on April 26, 2024
  - Hazard Index
  - Running Annual Average

Drinking Water

$$\text{Hazard Index (1 unitless)} = \left(\frac{[\text{HFPO} - \text{DA}_{\text{ppt}}]}{[10\ \text{ppt}]}\right) + \left(\frac{[\text{PFBS}_{\text{ppt}}]}{[2000\ \text{ppt}]}\right) + \left(\frac{[\text{PFNA}_{\text{ppt}}]}{[10\ \text{ppt}]}\right) + \left(\frac{[\text{PFHxS}_{\text{ppt}}]}{[10\ \text{ppt}]}\right)$$

Drinking Water

Chemical	Quarter 1		Quarter 2		Quarter 3		Quarter 4	
	Sample	Q1 Formula	Sample	Q2 Formula	Sample	Q3 Formula	Sample	Q4 Formula
HFPO-DA (ppt)	5 ppt	5 ppt/10 ppt = 0.5	5 ppt	5 ppt/10 ppt = 0.5	Not detected	0 ppt/10 ppt = 0	Not detected	0 ppt/10 ppt = 0
PFBS (ppt)	5 ppt	5 ppt/2000 ppt = 0.0025	5 ppt	5 ppt/2000 ppt = 0.0025	Not detected	0 ppt/2000 ppt= 0	5 ppt	5 ppt/2000 ppt = 0.0025
PFNA (ppt)	Not detected	0 ppt/10 ppt = 0	Not detected	0 ppt/10 ppt = 0	4 ppt	4 ppt /10 ppt = 0.4	Not detected	0 ppt/10 ppt = 0
PFHxS (ppt)	3 ppt	3 ppt/10 ppt = 0.3	Not detected	0 ppt/10 ppt = 0	4 ppt	4 ppt /10 ppt = 0.4	6 ppt	6 ppt/10 ppt = 0.6
Hazard Index (unitless)	0.5 + 0.0025 + 0 + 0.3 = 0.8025		0.5 + 0.0025 + 0 + 0 = 0.5025		0 + 0 + 0.4 + 0.4 = 0.8		0 + 0.0025 + 0 + 0.6 = 0.6025	

Running Annual Average = $\left(\frac{0.8025 + 0.5025 + 0.8 + 0.6025}{4}\right) = 0.6769 = 0.7$

The Hazard Index Running Annual Average result is 0.7 (rounded to one significant digit). Because this result does not exceed 1, the water system has not exceeded the MCL. Therefore, no violation of the Hazard Index MCL has occurred.

Drinking Water

Running Annual Average - With Full Results				
Compound	Calculated Level	Concentration	Hazard Index	Limit
perfluoroctanoic acid (PFOA)	2.57	ng/L		4.0
perfluorooctane sulfonic acid (PFOS)	3.55	ng/L		4.0
perfluorohexane sulfonic acid (PFHxS)	0.38	ng/L		10
hexafluoropropylene oxide dimer acid (HFPO-DA) and its ammonium salt	0.00	ng/L		10
perfluorononanoic acid (PFNA)	0.19	ng/L		10
perfluorohexane sulfonic acid (PFHxS)	0.38	ng/L	0.05985375	1.0
hexafluoropropylene oxide dimer acid (HFPO-DA) and its ammonium salt	0.00	ng/L		
perfluorononanoic acid (PFNA)	0.19	ng/L		
perfluorubutane sulfonic acid (PFBS)	6.21	ng/L		

Running Annual Average - NPDWR Calculated*				
Compound	Calculated Level	Concentration	Hazard Index	Limit
perfluoroctanoic acid (PFOA)	0.00	ng/L		4.0
perfluorooctane sulfonic acid (PFOS)	1.05	ng/L		4.0
perfluorohexane sulfonic acid (PFHxS)	0.00	ng/L		10
hexafluoropropylene oxide dimer acid (HFPO-DA) and its ammonium salt	0.00	ng/L		10
perfluorononanoic acid (PFNA)	0.00	ng/L		10
perfluorohexane sulfonic acid (PFHxS)	0.00	ng/L	0.00310375	1.0
hexafluoropropylene oxide dimer acid (HFPO-DA) and its ammonium salt	0.00	ng/L		
perfluorononanoic acid (PFNA)	0.00	ng/L		
perfluorubutane sulfonic acid (PFBS)	6.21	ng/L		
*Annual Averages are calculated using only the values that equal to or exceed their PQL.				

Wastewater

Wastewater

- Effluent Guidelines Program Plan 15
  - Pretreatment standards
  - Landfill pretreatment standards in development
  - Conducting additional studies on several other categories
  - POTW Influent Study….. more on this later

Wastewater

- CERCLA
  - PFOA & PFOS designated hazardous substances effective July 8, 2024
  - Releases of a pound or more in any 24-hour period

Plant Effluent Flow (MGD)	Effluent PFOA Result (ng/L)	Mass Load of PFOA in Plant Effluent (ppd)	Effluent PFOS Result (ng/L)	Mass Load of PFOS in Plant Effluent (ppd)
165.89	23	0.03182102	20	0.027670452
171.13	7.8	0.011132349	6.4	0.009134235
135.494	8.6	0.009718172	5.7	0.006441114
144.34	5.9	0.007102394	12	0.014445547

Wastewater

- POTW Influent PFAS Study
  - The data collection is to gather data on sources of PFAS discharges and prioritize industrial categories for potential regulation
  - Mandatory sampling at utility expense
  - 27 Texas POTWs impacted by this

Biosolids

Biosolids

- CERCLA
  - PFOA & PFOS designated hazardous substances effective July 8, 2024
  - Releases of a pound or more in any 24-hour period

Average Sludge Production in dry tons per day (dtpd)	Final Biosolids PFOA Result (ng/g)	Mass Load of PFOA in Final Biosolids (ppd)	Final Biosolids PFOS Result (ng/g)	Mass Load of PFOS in Final Biosolids (ppd)
124.15	1.2	2.9796E-07	12	2.9796E-06
162.51	3.3	1.07257E-06	12	3.90024E-06
70.75	4.3	6.0845E-07	13	1.8395E-06
100.89	1.8	3.63204E-07	11	2.21958E-06

Biosolids

- National Sewage Sludge Study (NSSS)
  - Data collection intended to establish a national data set of sewage sludge
  - Mandatory sampling at utility expense
  - 27 Texas POTWs impacted by this

Biosolids

- Texas H.B. 1674
  - Amends Agriculture Code to include biosolids for oversight by Texas Feed & Fertilizer Control Service
  - Regulates Biosolids for potentially 17 PFAS compounds
  - Up to State Jail Felony for violations
  - Must retain solids until testing confirms compliance

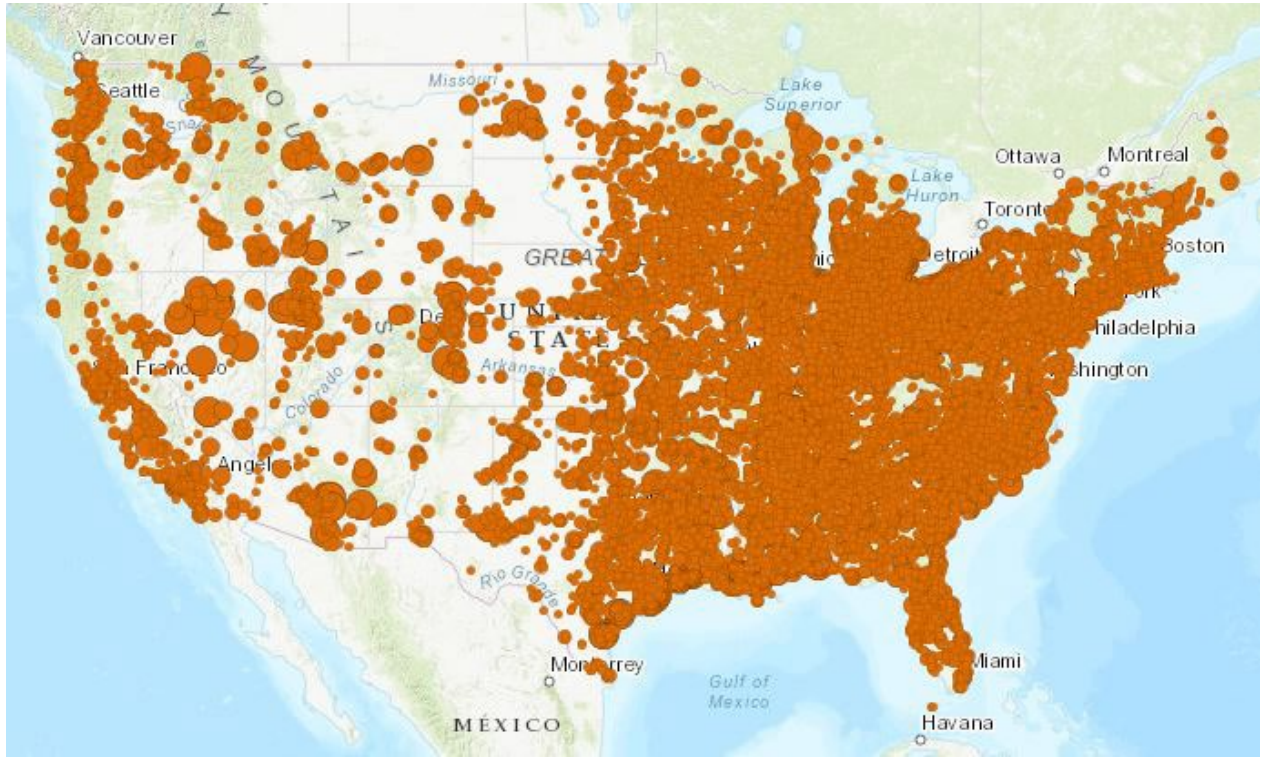
Biosolids

- EPA Draft Sewage Sludge Risk Assessment
  - Risk from use or disposal of sewage sludge by land application
  - Does NOT create any new regulatory requirements or standards
  - Problem
    - Unrealistic conditions
    - It put a number out there

Other PFAS Regulations

Other PFAS Regulations

- Toxic Release Inventory
  - Eliminated an exemption allowing facilities to avoid reporting on PFAS when used in small concentrations.



Other PFAS Regulations

- Aquatic Life Criteria and Benchmarks
  - 10 PFAS Compounds
  - Concentrations of pollutants, with specific duration and frequency of concentrations, that are protective of aquatic ecosystems as a whole
  - Used by State's and/or Tribe's to develop enforceable water quality criteria

Questions?

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