



Department of  
**Environment &  
Conservation**

**Public Hearing**  
**Water Quality, Oil and Gas Board**  
**William R. Snodgrass Tennessee Tower**  
**312 Rosa L. Parks Avenue, Nashville**  
**and via WebEx**  
**June 20, 2023 – 10:00am**

\*If you wish to make Public Comment, please fill out a yellow comment card, or if virtual please email [Drake.Smarch@tn.gov](mailto:Drake.Smarch@tn.gov) or message the chat box. Include what you want to comment on, and you will to be placed in line.

# Welcome!

- Opening remarks from the Division of Water Resources Director, Jennifer Dodd.
- Roll call of Board members present.

# Board Minutes

- Presentation of minutes from April 2023
- **Vote** for approval of minutes.
- Minutes are available on the Board's website: <https://www.tn.gov/environment/about-tdec/boards-and-commissions/board-tennessee-board-of-water-quality--oil-and-gas.html>



Department of  
**Environment &  
Conservation**

## Division of Water Resources Updates

Jennifer Dodd – Director – Division of Water Resources



Department of  
**Environment &  
Conservation**

# Per- and Polyfluoroalkyl (PFAS) Substances

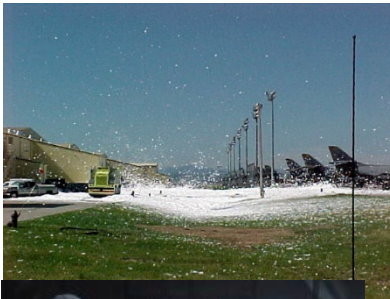
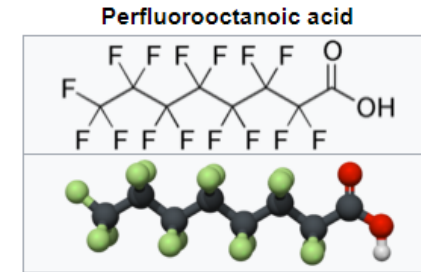
Jeremy Hooper | June 20, 2023

# Presentation Overview

- **Introduction**
  - What are PFAS?
  - Where are PFAS?
  - PFAS and Human Health
- **What is EPA doing?**
- **What is known about PFAS in TN?**
- **What is TDEC doing?**
  - DWR Sampling Initiative
  - Landfill / Wastewater Treatment Plant PFAS Working Group

# What are PFAS?

- Per- and Polyfluoroalkyl Substances (PFAS)
- More than 5,000 manmade fluorinated organic chemicals
  - Carbon-Fluorine Bond
  - Persistent in the natural environment
- Oil-, stain-, and water-repellent



Fire testing in AFFF in a confined space.



# Environmental Contamination Pathways

Air



Water

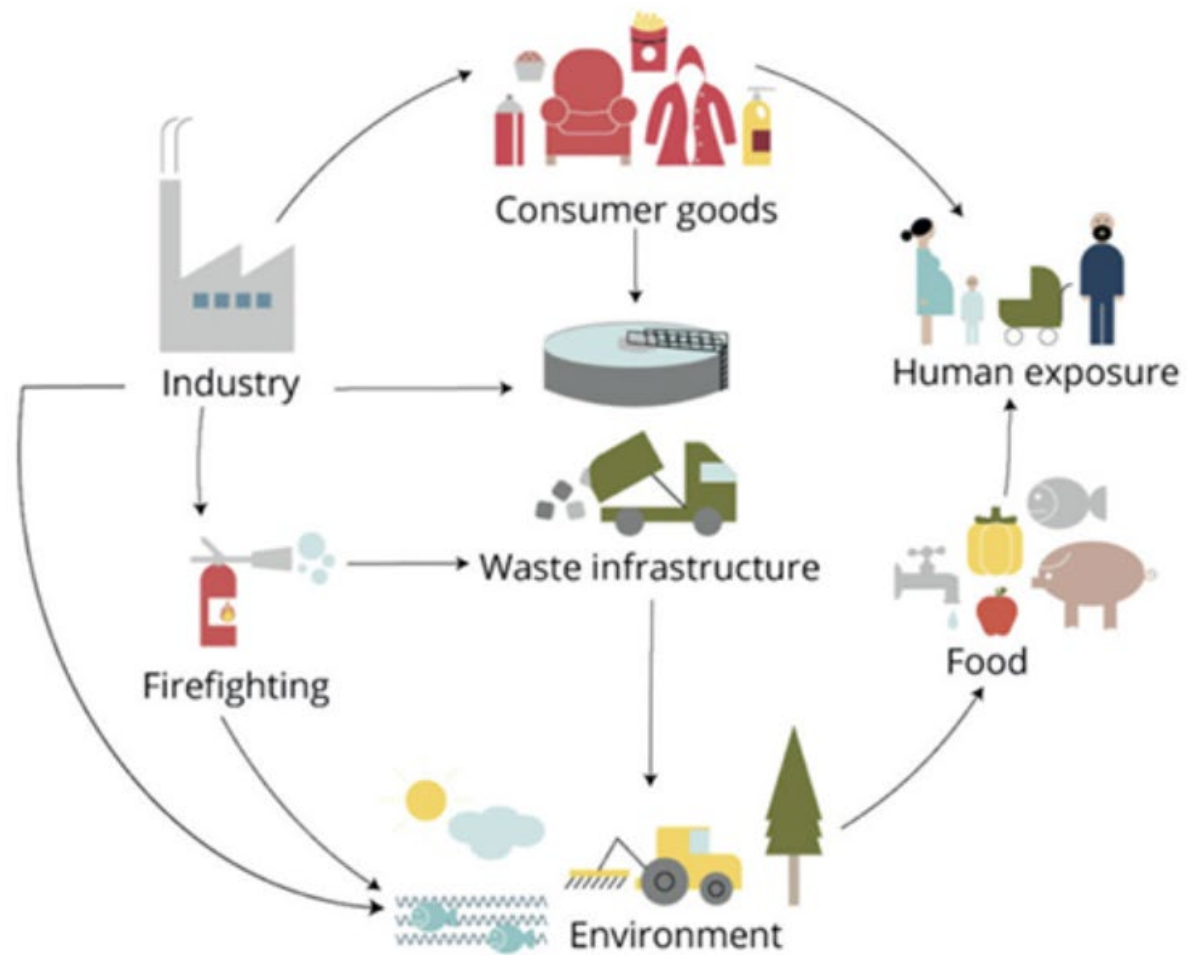


Land



Manufacturing – Use - Disposal

# PFAS Cycle



Source: <https://www.eea.europa.eu/>

# Potential Human Health Effects

## EPA

- Reproductive effects such as decreased fertility or increased high blood pressure in pregnant women.
- Developmental effects or delays in children, including low birth weight, accelerated puberty, bone variations, or behavioral changes.
- Increased risk of some cancers, including prostate, kidney, and testicular cancers.
- Reduced ability of the body's immune system to fight infections, including reduced vaccine response.
- Interference with the body's natural hormones.
- Increased cholesterol levels and/or risk of obesity.

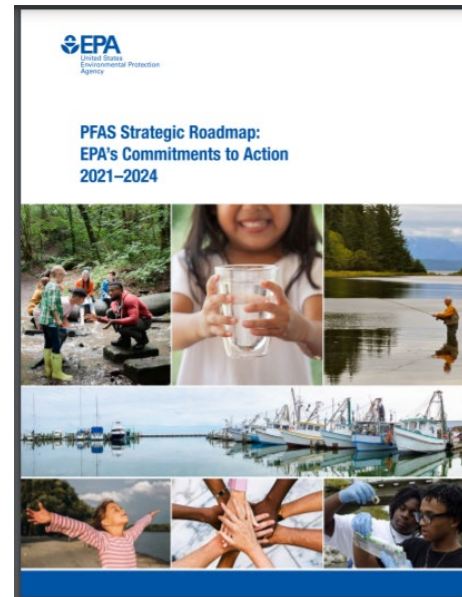
# Human Exposure to Pathways

- Occupational (e.g., chemicals manufacturing and processing)
- Drinking water contaminated with PFAS
- Foods containing PFAS (e.g., fish)
- Swallowing contaminated soil or dust
- Breathing air containing PFAS
- Using products made with or packaged in materials containing PFAS

# EPA's PFAS Strategic Roadmap 2021-2024

- Released Oct. 18, 2021
- Result of EPA Council on PFAS
- EPA's Approach
  - Consider the life cycle of PFAS
  - Get upstream of the problem
  - Hold polluters accountable
  - Ensure science-based decision-making
  - Prioritize protection of disadvantaged communities

## Goals



### RESEARCH

Invest in research, development, and innovation to increase understanding of PFAS exposures and toxicities, human health and ecological effects, and effective interventions that incorporate the best available science.

### RESTRICT

Pursue a comprehensive approach to proactively prevent PFAS from entering air, land, and water at levels that can adversely impact human health and the environment.

### REMEDiate

Broaden and accelerate the cleanup of PFAS contamination to protect human health and ecological systems.

# Recent EPA PFAS News

- **March 2023:** Proposed National Drinking Water Standard– Establish legally enforceable levels for 6 PFAS known to occur in drinking water

Compounds	Proposed Maximum Contaminant Levels
PFOS	4 parts per trillion (4.0 ng/L)
PFOA	4 parts per trillion (4.0 ng/L)
PFHxS	Hazard Index = 1.0 (unitless)*
GenX Chemicals	
PFNA	
PFBS	
*Learn more about the hazard index calculation, and the specific levels for these four PFAS below	

# What is TN doing?

TDEC has established a multi-agency, multidisciplinary work group

## TDEC Divisions:

- Solid Waste Management
- Water
- Air
- Policy & Planning
- Remediation
- OGC

## Other TN Agencies:

- Health
- TWRA

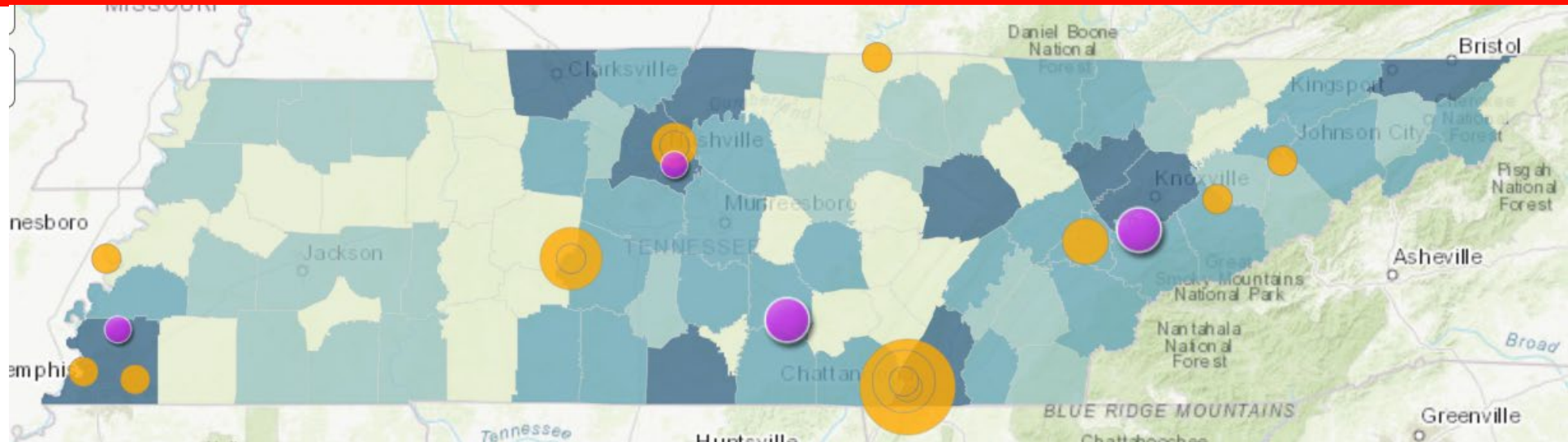
***\*\*Also established External Working Group\*\****

# PFAS Sampling in TN



- **UCMR3 (2013-2015)**
  - 500 finished DW samples, 136 PWS
  - 2 PWS with detections, below EPA HA levels at the time
  - Rutherford and Hamilton Counties
- **Fish Tissue Sampling 2008-2009 & 2013-2014**
  - Detections of PFAS in fish tissue in the Tennessee, Cumberland, Wolf, Nolichucky, Duck, French Broad and Mississippi Rivers
- **DOD Groundwater Sampling**
  - Nashville Air National Guard (Nashville International Airport) - Nashville
  - Arnold Air Force Base -Tullahoma
  - Air National Guard – McGhee Tyson Airport - Knoxville
  - NSA Mid-South - Millington
  - PFAS detections at all locations

# TDEC Map on Website



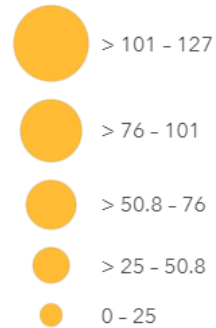
## Department of Defense Sites

Locations\_with\_Samples > EPA\_Health\_Advisory\_Level



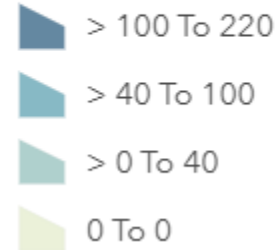
## 2008-2009 & 2013-2014 NRSA Fish Data

Amount (ppb)

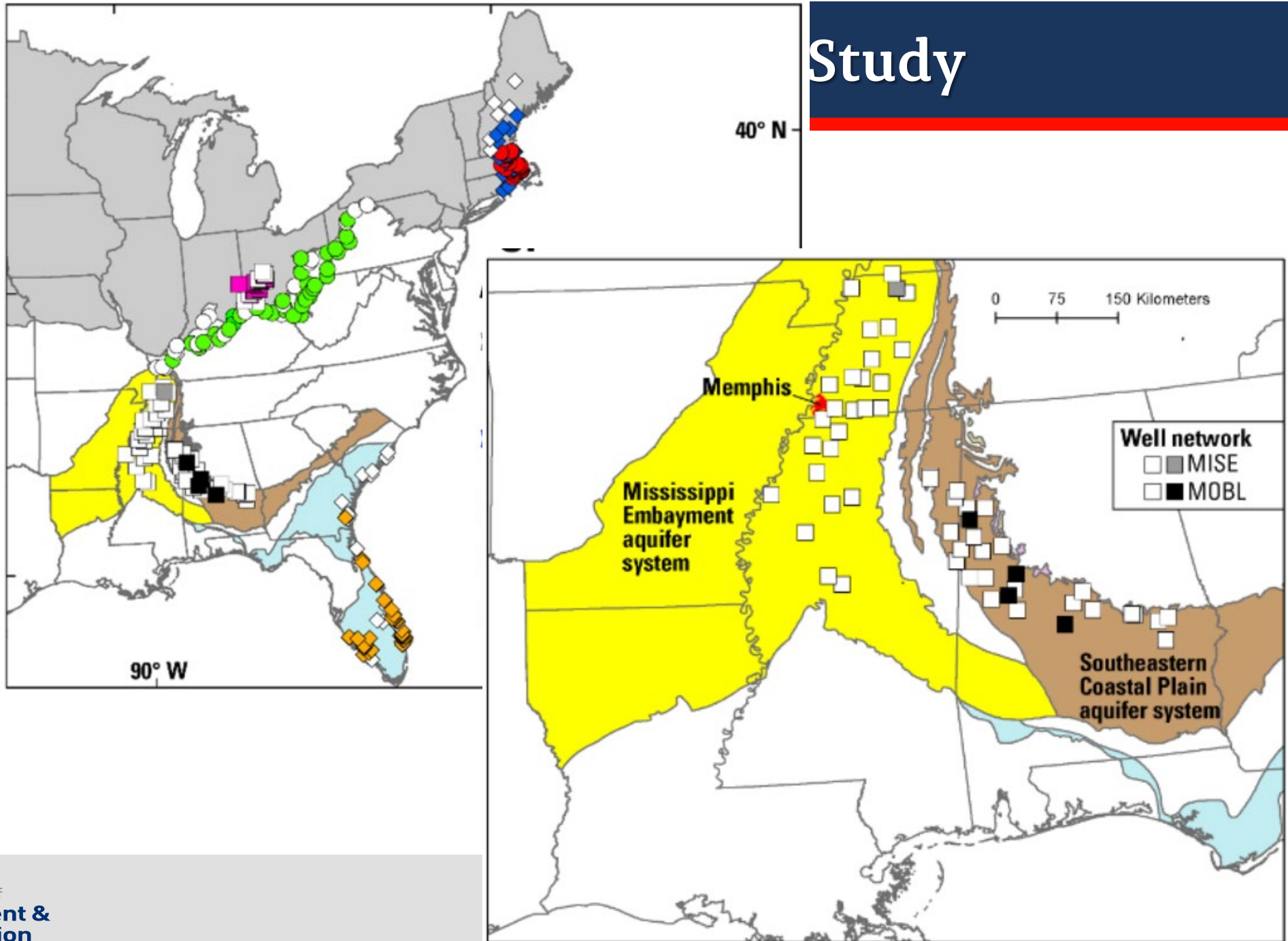


## UCMR3 Sampling Data by County

Sampling Events



# Study



# U.S. Geological Survey Study

- **Samples taken in 2019**
  - 5 aquifers systems in the eastern U.S.
  - Memphis Sand aquifer
  - 24 PFAS
- **Memphis Sands Results**
  - 27 samples
  - 1 detection (3.7% detection frequency)
    - PFOS
    - 2.2 ppt
  - Fewest detections per aquifer system

# U.S. Geological Survey Study

- **Authors Findings / Conclusions**

- Samples that contain a PFAS detection have significantly shallower well depths
- Detection of PFAS in groundwater decreases with increasing well depth
- The level of protection against PFAS contamination provided by depth and age could decrease over time as shallow groundwater moves deeper into an aquifer system
- Consider PFAS sources near wells
- Memphis Sands “characterized by deep wells, low fraction of modern water (post 1953\*), and a low PFAS detection”

\*Premodern water (pre-1953) is close to the date when PFAS started to be widely used (~1950)

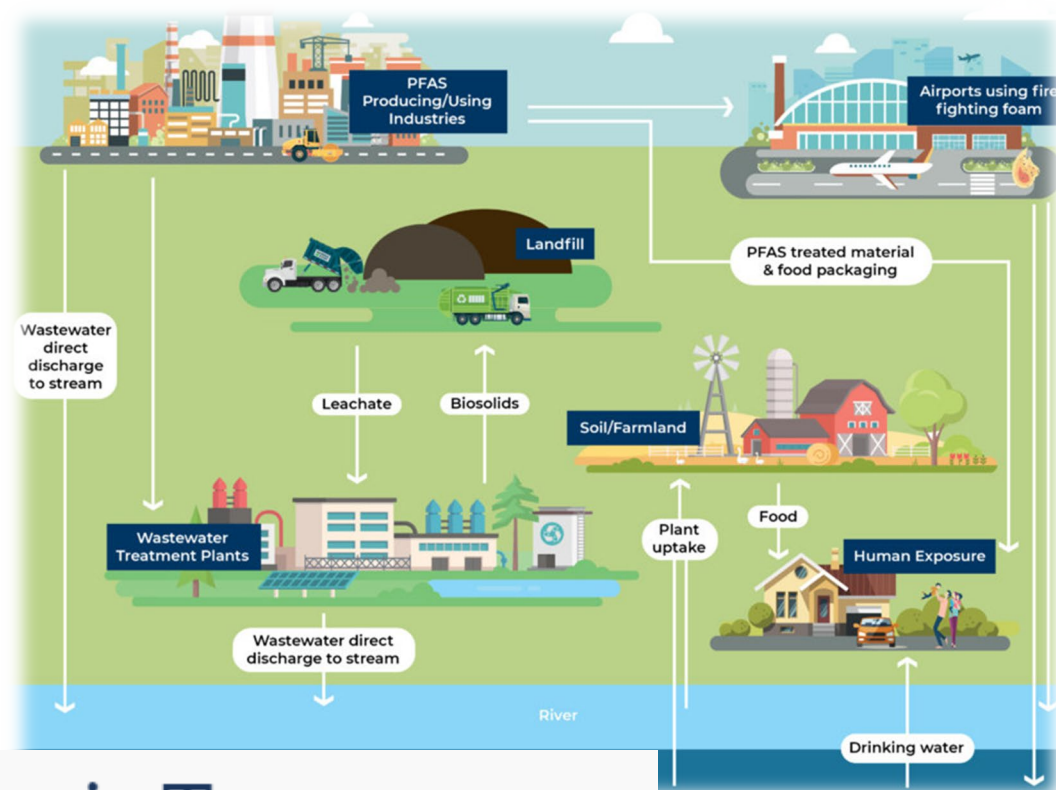
# TDEC PFAS Sampling Initiative

*The Tennessee Department of Environment and Conservation (TDEC) will initiate a statewide effort to sample all public drinking water system sources for 29 PFAS.*

- **Why do it?**
  - Human health concerns; EPA Health Advisory Level
  - Additional sampling presents more comprehensive picture of if and where PFAS contamination occurs
  - Results will help TDEC and regulated community understand how potential federal PFAS regulations may affect Tennessee
- **Scope**
  - Statewide
  - Conducted by Division of Water Resources (DWR)
- **Funding**
  - Drinking Water State Revolving Fund Set-Asides
  - EPA grant

# Other TDEC Updates

- **Landfill/WWTP Working Group**
- **Updates to website**
  - Better information to the public
  - External sampling data page
- **Continued engagement on regional and national working groups**



## External PFAS Sampling in Tennessee

As described on TDEC's main PFAS webpage, TDEC is preparing to conduct a statewide PFAS screening effort. Outside of TDEC, the U.S. Department of Defense (DOD), U.S. Environmental Protection Agency (EPA), and some localities have conducted their own sampling for various PFAS constituents in Tennessee. Some of this data is reflected in the map below; however, due to differences in the sampling efforts (e.g., different sampling methodologies, reporting mechanisms, media sampled), it is challenging to summarize all sampling data in a unified manner via this map (which can also be [accessed HERE](#)). Therefore, TDEC plans to use this webpage to share information and data, made available to TDEC, from external PFAS sampling efforts.

# Sources

- Agency for Toxic Substances and Disease Registry (ATSDR). 2018. Toxicological Profile for Perfluoroalkyls—DRAFT for Public Comment. Retrieved June 2018 from <https://www.atsdr.cdc.gov/toxprofiles/tp200.pdf>
- C8 Science Panel. n.d. The Science Panel Website. Retrieved April 22, 2019 from <http://www.c8sciencepanel.org/>
- International Agency for Research on Cancer (IARC). 2018. Perfluorooctanoic Acid Monograph. Retrieved April 2019 from <https://monographs.iarc.fr/wp-content/uploads/2018/06/mono110-01.pdf>
- Michigan PFAS Science Advisory Panel. 2018. Scientific Evidence and Recommendations from Managing PFAS Contamination in Michigan. Retrieved April 22, 2019 from [https://www.michigan.gov/documents/pfasresponse/Science\\_Advisory\\_Board\\_Report\\_641294\\_7.pdf](https://www.michigan.gov/documents/pfasresponse/Science_Advisory_Board_Report_641294_7.pdf)
- United States Environmental Protection Agency (EPA). 2019. EPA's Per- and Polyfluoroalkyl Substances (PFAS) Action Plan. Retrieved February 2019 from: <https://www.epa.gov/pfas/epas-pfas-action-plan>

# Sources

- Ritter S. 2010. Fluorochemicals go short. Chemical & Engineering News 88: 12-17 doi: 10.1021/cenv088n005
- Eschauzier C, Beerendonk E, Scholte-Veenendaal P, De Voogt P. 2012. Impact of Treatment Processes on the Removal of Perfluoroalkyl Acids from the Drinking Water Production Chain. Environmental Science and Technology 46(3): 1708-1715. doi: 10.1021/es201662b

# Thank you! Questions?



# Contact Information

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Department of  
**Environment &  
Conservation**

**Office of General Counsel**  
Rogers Group – Joint Motion



Department of  
**Environment &  
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## Petition for Rulemaking Procedure

Stephanie Durman – OGC

# Tenn. Code Ann. § 4-5-201

(a) Except where the right to petition for a rule is restricted by statute to a designated group or except where the form of procedure for such petition is otherwise prescribed by statute, any municipality, corporation or any five (5) or more persons having an interest in a rule may petition an agency requesting the adoption, amendment or repeal of such rule.

(b) Such petition shall state clearly and concisely:

- (1) The substance or nature of the rulemaking that is requested;
- (2) The reasons for the request and the petitioner's interest in the request; and
- (3) Reference to the authority of the agency to take the action that is requested.

## Tenn. Code Ann. § 4-5-201

(c) After submission of a petition, the agency shall, as promptly as is consistent with the orderly dispatch of its business, deny the request or grant the same or provide for some modified form of the rule to be proposed. If the agency denies the petition, it shall promptly give notice thereof to the person who filed the petition. If the agency grants the petition in whole or in part, it shall proceed to meet the rulemaking requirements set out in this chapter.

# Today's Process

- I. Introduction – summary/process (Stephanie Durman)
- II. The petitioner(s) are given 10 minutes for their presentation (Brian Paddock)
- III. The department offers a 10-minute response/rebuttal (Patrick Parker & April Grippo)
- IV. Open public comment on the petition in a total of three minutes per speaker (this excludes petitioner organizations and TDEC)
- V. Close public comment. Begin board questions for the petitioner and department
- VI. The Board deliberates and votes on one of the following actions:

# Alternatives

Alternative Board Action 1: Board approves the petition in whole. Board directs the Department to draft rules in whole. Then the Department begins the normal UAPA rulemaking process.

Alternative Board Action 2: Board approves the petition with modifications. Board directs the Department to draft rules in accordance with the petition. Then the Department begins the normal UAPA rulemaking process.

Alternative Board Action 3: Board denies the petition. The Board will give prompt written notice to the petitioners.



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## Petition for Rulemaking

Petitioner – Brian Paddock

Representing the Department – Patrick Parker



Department of  
**Environment &  
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**Petition for Rulemaking**

**Petitioner – Brian Paddock**



Department of  
**Environment &  
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## Petition for Rulemaking

Representing the Department – Patrick Parker



Department of  
**Environment &  
Conservation**

**Petition for Rulemaking**

**Public Comment about the Petition**



Department of  
**Environment &  
Conservation**

## Petition for Rulemaking

Board Questions, Deliberation, and Vote

Any Old Business?

Thank you for joining us.  
Any questions, please direct to  
[Drake.Smarch@tn.gov](mailto:Drake.Smarch@tn.gov)