



MassDEP PFAS Drinking Water Standards

Town of Wellesley

December 16, 2021

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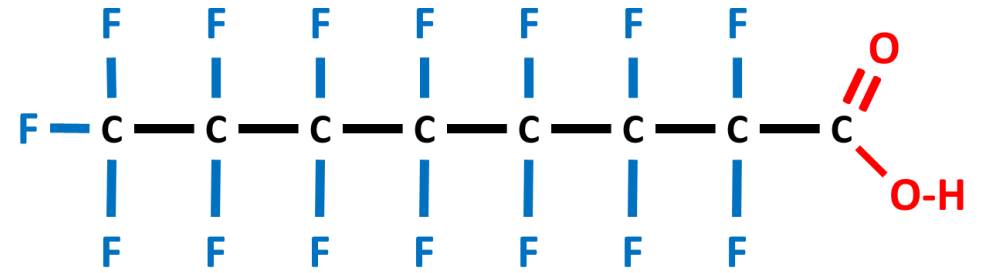
Director

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What Are PFAS?



Poly- and perfluoroalkyl Substances

A family of thousand of compounds with varying structure

(e.g, carbon chain length)

- **Extremely stable** – Heat & Stain Resistant, Water repellent
- **“Forever chemicals”** - Very persistent, do not biodegrade
- **Water Soluble**
- **Some are very toxic**
 - Slowly excreted from the body – half lives of years (1-8+ for longer-chain)
 - Developmental risks to fetus/infants
 - Endocrine disruption, effects on immune system
 - Possibly cancers (kidney, teste, pancreas, liver)



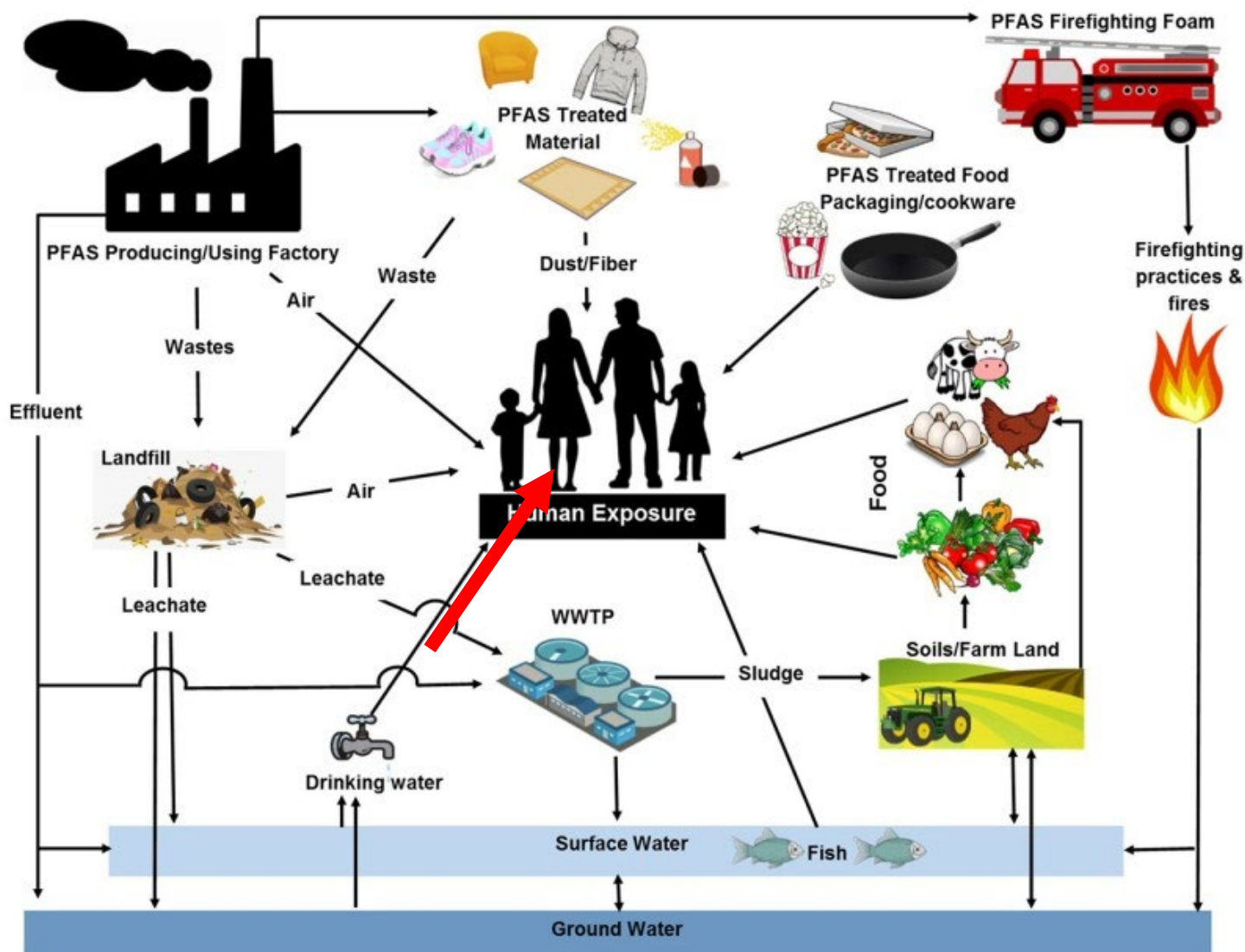
Common Uses of PFAS Since the 1950s

- Textile treatments: stain resistance/ water repellency
- Paper coatings: grease resistant
- “Waxes”: some floor, car, ski
- “Waterproof” down
- Manufacturing
- Aqueous Film-Forming Foam (AFFF)



Most Americans are exposed to some levels of PFAS through use of consumer products

Environment & Human Exposure to PFAS

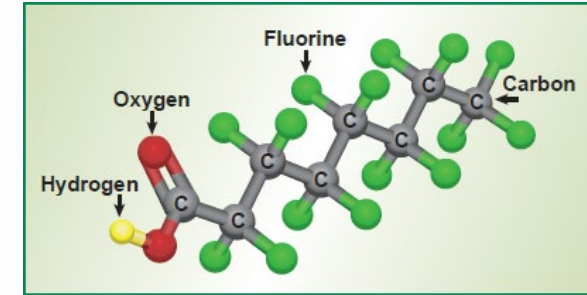


Human Exposure and sources of PFAS
Image: DWP, adapted from Oliaei et al. 2013.

Why Are PFAS a Concern?

- **TOXICITY AT LOW EXPOSURE LEVELS**

- DEVELOPMENTAL
- IMMUNE SYSTEM
- THYROID
- LIVER



- **PERSISTENT**

- DO NOT APPRECIABLY BREAKDOWN IN THE ENVIRONMENT
- LONG (YEARS) SERUM HALF LIVES

- **WATER SOLUBLE AND WIDESPREAD IMPACTS**

What Are Exposures of Concern for PFAS?

Sensitive groups

- *Pregnant women, nursing mothers and infants*
 - *Immunocompromised*
-

Water uses that pose (relatively) less concern include:

- Water use by someone not considered in a “sensitive group”
- Non-residential water use – *restaurants, workplace*
- Water use for other purposes – *bathing, washing vegetables*

Ways people may reduce potential exposure:

- Consume water below the MCL
- Avoid PFAS products
- Minimize exposure to house dust



What Is MassDEP Doing About PFAS?

Developed Drinking
Water and Waste
Site Cleanup
Standards

Technical Assistance,
Education, Outreach,
Coordination,
Learning, Training

Firefighting Foam
Take-Back Program

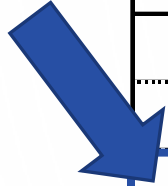
Working to Identify
Sources & Releases
to the Environment

Sampling & Analyses
for Public Water
Systems and Private
Wells



Subclass of Longer Chain PFAS Regulated by MassDEP

# Carbons	EPA Method 537 Analytes	
4	PFBS	Perfluorobutanesulfonic acid
6	PFHxA	Perfluorohexanoic acid
6	PFHxS	Perfluorohexanesulfonic acid
7	PFHpA	Perfluoroheptanoic acid
8	PFOA	Perfluorooctanoic acid
8	PFOS	Perfluorooctanesulfonic acid
9	PFNA	Perfluorononanoic acid
10	PFDA	Perfluorodecanoic acid
11	NMeFOSAA	2-(N-Methylperfluorooctanesulfonamido)acetic acid
11	PFUnA	Perfluoroundecanoic acid
12	NEtFOSAA	2-(N-Ethylperfluorooctanesulfonamido)acetic acid
12	PFDoA	Perfluorododecanoic acid
13	PFTTrDA	Perfluorotridecanoic acid
14	PFTA	Perfluorotetradecanoic acid



PFAS6 Subclass Characteristics

- Share similar chemical structures
- Share similar toxicity profiles
 - Liver
 - Thyroid
 - Development
 - Immune system
- Cause adverse effects at similar doses
- EPA Approved Analytical methods



Key Elements of MassDEP PFAS Drinking Water Regulations

- Standard of 20 ppt applies to each PFAS individually and sum of all six
 - No federal standard; EPA Advisory = 70 ppt for 2/6
- Health-based and protective of the most sensitive populations
- Requires a technical review every three years
 - ✓ Possible revisions to standards and consideration of additional PFAS



Applicability of the Drinking Water Standards

Apply to:

- Community Water Systems (year-round residential customers)
- Non-transient, Non-Community Water Systems
 - Schools/Daycares, Larger Businesses (25+ employees)

Do not apply to:

- Transient, Non-Community Water Systems
 - Recreational areas, Hotel/Motels, Small Businesses
 - But they must sample



Drinking Water Values for PFAS by State

	PFOS	PFOA	PFNA	PFHxS	PFHpA	PFDA
U.S. EPA	70		NA	NA	NA	NA
Health Advisory	Sum of two					
MA MCL, GW standard	70 (2018 ORSG) → 20 (MCL; MCP GW standard) Sum of five → Sum of six (add PFDA) MCL October 2020: Sum of six PFAS = 20					
VT MCL		20	Sum of five			NA
CT Action Levels		70	Sum of five			NA
WI Recommended GW standard	20					
ATSDR Based on draft ATSDR toxicity values and EPA exposure parameters	7	11	10	70	NA	NA
NY MCL	10	10	NA	NA	NA	NA
NJ MCL	13	14	13	NA	NA	NA
CA Notification levels (Response Levels)	6.5 (40)	5.1 (10)	NA	NA	NA	NA
MI MCL	16	8	6	51	NA	PFNA value recommended
MN guidelines	15	35	NA	47	NA	NA
NH MCL	15	12	11	18	NA	NA
Most other states (EPA value by default)	70		NA	NA	NA	NA

Results are in nanograms per liter (ng/L or parts per trillion (ppt))



A Few Things to Keep in Mind

- Consuming water with PFAS6 above the drinking water standard does not mean that adverse effects will occur.
- The degree of risk depends on the level of the chemicals and the duration of exposure.
- The drinking water standard assumes that individuals drink only contaminated water, which typically overestimates exposure.
- Risks somewhat above the MCL are likely to be low but cannot be ruled out.
- MassDEP staff may be able to assist in answering questions. As individual circumstances and concerns vary, consumers with specific health concerns may wish to consult their doctor or health professional.



Acknowledgements

Massachusetts Department of Environmental Protection

- Office of Research and Standards

DR. Sandra Baird

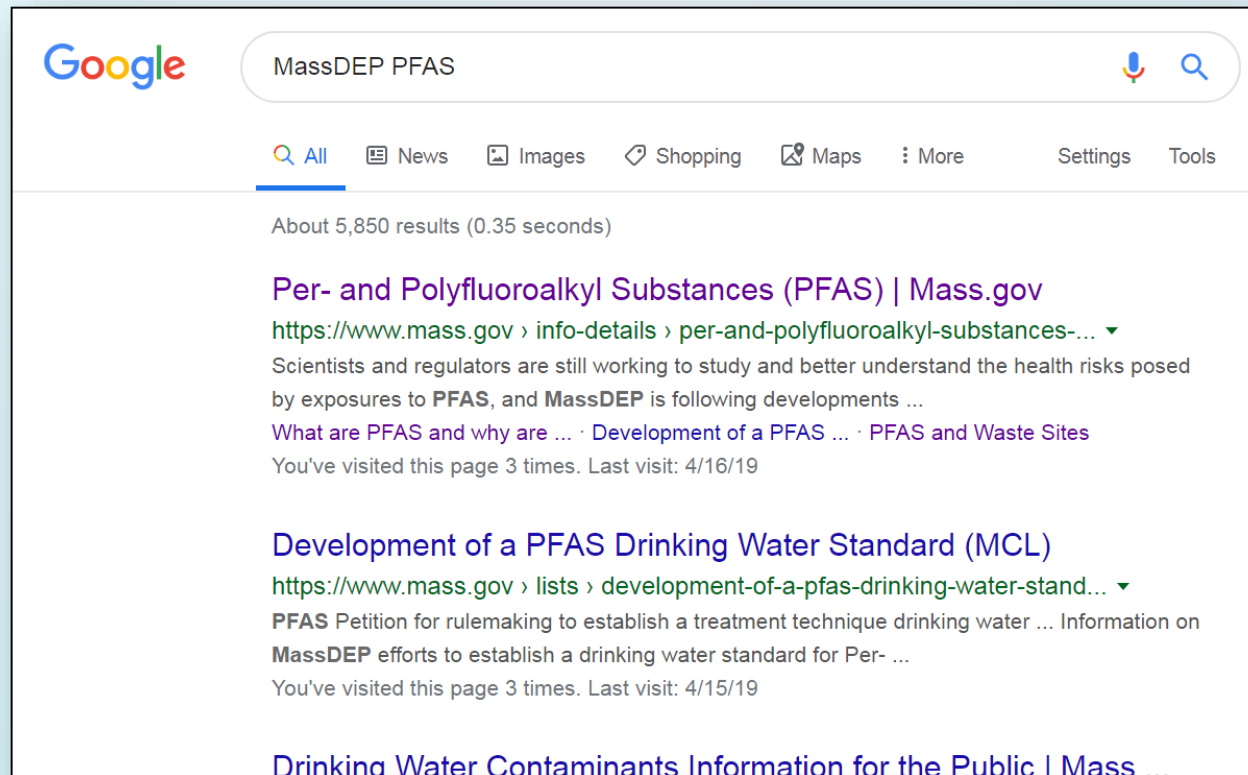
Dr. Tsedash Zewdie

- Drinking Water Program staff



More Information...

Just Google... *MassDEP PFAS*



Google search results for "MassDEP PFAS".

Search results for "MassDEP PFAS" (About 5,850 results (0.35 seconds))

Per- and Polyfluoroalkyl Substances (PFAS) | Mass.gov
<https://www.mass.gov/info-details/per-and-polyfluoroalkyl-substances-...>
Scientists and regulators are still working to study and better understand the health risks posed by exposures to **PFAS**, and **MassDEP** is following developments ...
[What are PFAS and why are ...](#) · [Development of a PFAS ...](#) · [PFAS and Waste Sites](#)
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Development of a PFAS Drinking Water Standard (MCL)
<https://www.mass.gov/lists/development-of-a-pfas-drinking-water-stand...>
PFAS Petition for rulemaking to establish a treatment technique drinking water ... Information on **MassDEP** efforts to establish a drinking water standard for Per- ...
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[Drinking Water Contaminants Information for the Public | Mass...](#)

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