



# Maine DEP's Response to PFAS in the Environment

Maine Water Environment  
Association (MeWEA) Spring  
Conference, Orono

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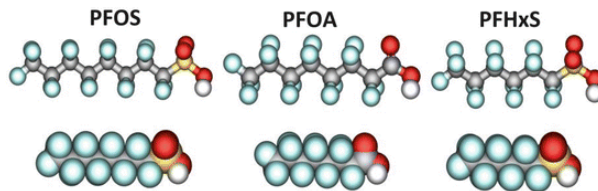
MAINE DEPARTMENT OF ENVIRONMENTAL PROTECTION

*Protecting Maine's Air, Land and Water*

# What are PFAS?

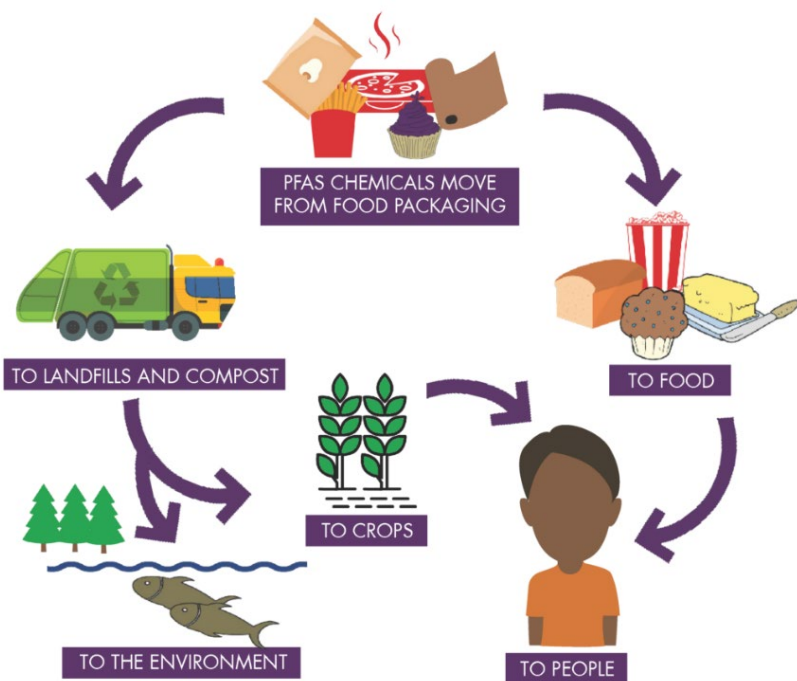
**PFAS = per- and poly fluoroalkyl substances**

- 32 MRS §1732, 38 MRS §1612 → Any member of the class of fluorinated organic chemicals containing at least one fully fluorinated carbon atom
- Used in consumer products – grease and water repellent due to a strong C-F bond which is very difficult to break



# Where are PFAS?

- Found in Maine in:
  - Ground and Surface Water
  - Active/Closed Landfills
  - Sludge/Septage Land Application Sites
  - Contaminated/Remediation Sites (AFFF often the source)
- In some places impacts to:
  - Drinking Water
  - Agriculture
  - Fish & Wildlife



# Why be concerned about PFAS?

Called “*Forever Chemicals*” because they take a long time to break down in the environment

According to the US CDC, health impacts MAY include:

Increased cholesterol levels

Changes in liver enzymes

Decreased vaccine response in children

Increased risk of high blood pressure or pre-eclampsia in pregnant women

Small decreases in infant birth weights

Increased risk of kidney or testicular cancer



# Key PFAS Guidelines/Regulations

**Public Resolve, 2021, Chapter 82, Effective June 21, 2021:**  
*Resolve to Protect Consumers of Public Drinking Water by  
Establishing MCLs for Certain Substances and Contaminants*

**Maine's Interim  
Drinking Water Std  
= 20 ppt  
for the sum of six PFAS:  
PFOA, PFOS, PFNA, PFDA, PFHpA & PFHxS**

Final Rule to be developed by Maine Drinking Water Program by  
**June 1, 2024**



# Key PFAS Guidelines/Regulations

- Screening levels
  - Soils
  - Recreational fishing
  - Milk
  - Beef
  - Dairy (to hay, to corn)
- Developed in coordination with Maine CDC and Maine DACF

## MAINE PFAS SCREENING LEVELS

June 2021

Soil Remedial Action Guidelines <sup>1</sup> (mg/kg)						
Compound	Leaching to Groundwater	Residential	Commercial Worker	Park User	Recreator Sediment	Construction Worker
PFBS	7.1	1,700	22,000	4,900	5,700	51,000
PFOS	0.0036	1.7	22	4.9	5.7	5.1
PFOA	0.0017	1.7	22	4.9	5.7	5.1

Soil Beneficial Use (ng/g, dry weight)	
Compound	Beneficial Use
PFBS	1,900
PFOS	5.2
PFOA	2.5

Recreational Angler RAGs (mg/kg wet weight)	
Compound	Fish Tissue
PFBS	52
PFOS	0.052
PFOA	0.052

Interim Drinking Water Standard (ng/l or ppt)	
Compound	Residential
PFOS + PFOA + PFHpA + PFNA + PFHxS + PFDA	20

Milk (ng/l or ppt)	
Compound	Action Level
PFOS	210

Beef (ng/g)	
Compound	Action Level
PFOS	3.4

Dairy <sup>2</sup> - PFOS Crop-Specific Soil Screening Levels (ng/g dry weight)			
	Soil to Hay to Milk Screening Level	Soil to Corn-Silage to Milk Screening Level	Soil to Hay and Corn-Silage to Milk Screening Level
Grass-Based Farm	6.8	120.0	6.4
Average Maine Farm	13.8	54.8	11.0

Helpful Conversions: 0.000001 ppm = 0.001 ppb = 1 ppt

Parts Per Million (ppm)	Parts Per Billion (ppb)	Parts Per Trillion (ppt)
1 milligram/kilogram (mg/kg) = 1 ppm	1 microgram/kilogram (µg/kg) = 1 ppb	1 nanogram/kilogram (ng/kg) = 1 ppt
1 milligram/liter (mg/l) = 1 ppm	1 microgram/liter (µg/l) = 1 ppb	1 nanogram/liter (ng/l) = 1 ppt
1 microgram/gram (µg/g) = 1 ppm	1 nanogram/gram (ng/g) = 1 ppb	1 picogram/gram (pg/g) = 1 ppt

<sup>1</sup> Maine Department of Environmental Protection (Maine DEP), [Maine Remedial Action Guidelines \(RAGs\) for Contaminated Sites](#), effective May 1, 2021.

<sup>2</sup> Maine DEP, [Maine Solid Waste Management Rules: Beneficial Use of Solid Wastes, 06-096 C.M.R. ch. 418](#), Appendix A, last amended July 8, 2018.

<sup>3</sup> Maine DEP, [Maine RAGs for Contaminated Sites](#), effective May 1, 2021.

<sup>4</sup> Resolve 2021, ch. 82, [Resolve To Protect Consumers of Public Drinking Water by Establishing Maximum Contaminant Levels for Certain Substances and Contaminants: Emergency](#), effective June 21, 2021.

<sup>5</sup> Maine Center for Disease Control and Prevention (CDC), [Action Levels for PFOS in cow's milk](#), Memorandum to Rachael Fiske, Maine Department of Agriculture, Conservation and Forestry (DACF), from Andrew Smith, SM, ScD and Thomas Simones, PhD, Maine CDC, March 28, 2017.

<sup>6</sup> Maine CDC, [Action Levels for PFOS in beef for use in determining whether beef at a farm is adulterated](#), Memorandum to Nancy McBrady, Maine DACF, from Andrew Smith, SM, ScD and Thomas Simones, PhD, Maine CDC, August 4, 2020.

<sup>7</sup> Maine CDC, [Derivation of PFOS soil screening levels for a soil-to-fodder-to-cow's milk agronomic pathway](#), September 16, 2020.



MAINE DEPARTMENT OF ENVIRONMENTAL PROTECTION

[www.maine.gov/dep](http://www.maine.gov/dep)

# Public Law 2021, Chapter 478

## *An Act To Investigate Perfluoroalkyl and Polyfluoroalkyl Substance Contamination of Land and Groundwater*

- Effective October 18, 2021
- Requires DEP to establish and implement:
  - Soil and groundwater investigation for contamination derived from licensed land applications of sludge and septage
  - Landfill leachate sampling
  - Land Application Contaminant Monitoring Fund (LACMF)



# PFAS Investigation

- Estimate over 700 application sites statewide - thousands of data points, several decades of licensing information
- Sites may be multiple fields/locations crossing municipal boundaries and may have had multiple sources applied to one location
- Tiered risk-based approach used to prioritize based on volume applied, proximity to receptors, and inputs
- Half must be completed by 2024; all by 2025
- Focus – **Soil and Water**
- Staff moving as fast as possible!

## *Estimated Timelines*

- **Tier I sites: Through early 2023**
- **Tier II sites: 2023 – 2024**
- **Tier III & IV sites: 2024 – 2025**





# PFAS Investigation Process

1. In depth review of project licenses/annual reports to confirm land application site locations
2. Develop a site-specific sampling & analysis plan (SAP)
3. Contact landowner/homeowner to schedule sampling events
4. Coordinate with the DACF for farm-specific considerations
5. Conduct sampling event and deliver samples to the lab
6. Obtain and review lab results and review for data quality
7. Provide landowner/homeowner with laboratory results
8. Evaluate data to determine need for stepped out sampling
9. Elevated soil results: DACF works with landowners/farmers
10. Elevated water results: DEP/DWP provide clean drinking water



# What we've learned so far

- Over 660 private groundwater well samples taken statewide:

## PRELIMINARY Groundwater Results as of March 25, 2022 Maine's Interim DW Standard = 20 ppt Sum of 6 PFAS

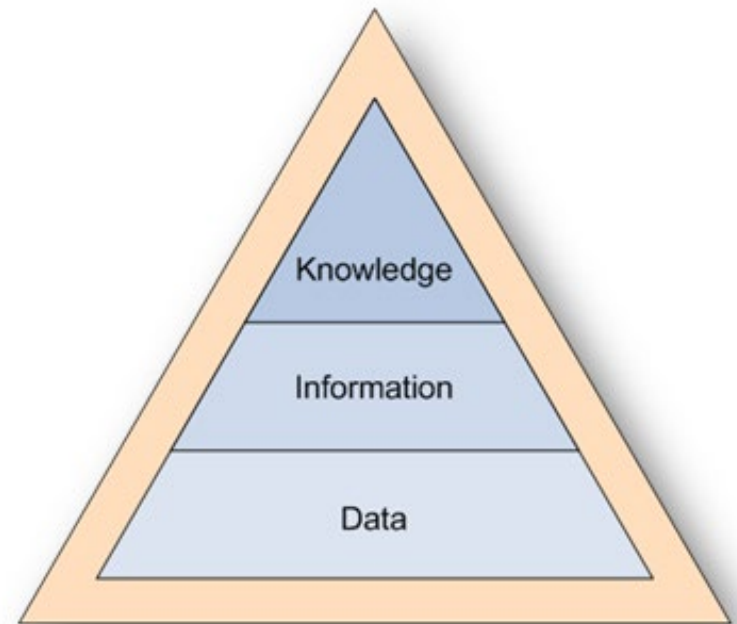
Location	< 20 ppt	20 – 100 ppt	100 – 1000 ppt	> 1000 ppt
Fairfield Area (Fairfield, Unity Twp, Benton, Oakland)	54.5%	21%	15%	9.5%
Statewide non-Fairfield Area	83%	9%	5%	3%

- Key takeaway - PFAS contamination is not uniform throughout Maine - anticipate there will be “hot” spots like Fairfield, but not statewide.



# Coming Soon

- To soon for any statistics on soil sampling
  - Soil sampling to begin in earnest mid-April – Tier 1 communities
  - Aggressive schedule both soil and groundwater through field season
  - Will include sampling of septage land application sites in addition to sludge
- Some landowners/farmers and homeowners choosing to self test with varying results



# Landfill Leachate sampling

- Applies to landfills that “manage and collect” leachate
  - Other landfills being looked at through DEP’s Remediation Program (e.g., closed municipal program)
- Letter requiring sampling sent by DEP 9/2021.
- 5 samples each landfill beginning Fall 2021 – Fall 2023; All submitted first round of samples.

**Concentrations of Sum of  
6 PFAS range from 5.62  
ng/L to 22,661.5 ng/L**

**PFOA was detected in  
all samples**



# Closed Landfill Testing

- Many closed landfills are unlined and don't "manage and collect leachate" – 400 +
- Managed under DEP's closed landfill remediation program
- Sampling occurs in monitoring wells
- 40 were evaluated since 2020; 20 more planned for 2022
- 19 filter systems have been installed in 7 municipalities
- 1 residence connected to public water line



# What do we do with PFAS?

- PFAS treatment and disposal still a major problem to be resolved:
  - Wastewater treatment (leaves behind residual PFAS solids)
  - Landfills (some landfills not enthusiastic to take PFAS wastes from known sources)
  - Hazardous waste landfills (will take PFAS, but very expensive requires transport out of state)
  - Composting (Need to figure out effective recipes, DEP started a pilot last week for Turkey carcasses )
  - Incineration (concerns about air deposition of PFAS, more to be learned)
  - Super critical water oxidation (still in research phase - EPA)
  - Phytoremediation (new research ongoing, but disposal issues)



# New Proposed Legislation

- LD 1875: Leachate treatment study for PFAS at State Owned Landfills (JRL/Dolby) – led by Bureau of General Services
- LD 1911: (only some of the provisions below)
  - Ban on land application, sale, and distribution of sludge and sludge derived compost/fertilizer (with some exceptions)
  - Study future ban on septage land application
    - No issuance of new septage licenses
    - Allow current licensees to surrender septage licenses
    - Allow DEP to halt land application if PFAS results come in high
  - Repeal \$10/ton sludge and septage fees from 2021





**Contact Maine DEP at: [pfas.dep@maine.gov](mailto:pfas.dep@maine.gov)**

**[www.maine.gov/dep/spills/topics/pfas/index.html](http://www.maine.gov/dep/spills/topics/pfas/index.html)**

