ASTSWMO Joint Hazardous Waste and Materials Management Training

PFAS Legislation and Action in Maine

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Why are we finding PFAS in Maine?

- Permitted land spreading of treated municipal wastewater residuals and industrial residuals
- Permitted septage land spreading
- Former military sites and closed unlined landfills
- Discharge of effluent to waterways
- AFFF discharges
- Sludge-derived compost and certain agricultural products

Response to PFAS Contamination

- Governor's PFAS Task Force in March 2019. Recommendations regarding safe drinking water and food and identifying and investigating PFAS in the environment
- Since 2019, development of PFAS screening levels for drinking water, soil beneficial use, milk, beef, and crop-specific soil (soil-hay-milk; soil-corn silage-milk)
- Retail milk testing led to identification of additional dairy farm with PFOS above state's milk Action Level; DEP water testing led to a third

Key Legislation

Focus on 6 laws from Maine's 130th legislature (2021-2022)	
Interim Drinking Water Standard	Resolve 2021, Chapter 82
Soil and Groundwater Investigation	Public Law 2021, Chapter 478
Study PFAS management at state-owned landfills	Resolve 2021, Chapter 172
Sludge and sludge-derived products ban	Public Law 2021, Chapter 641
PFAS in food packaging	32 M.R.S. § 1733 (3-B)
PFAS in products	38 M.R.S. § 1614

Maine's Interim Drinking Water Standard

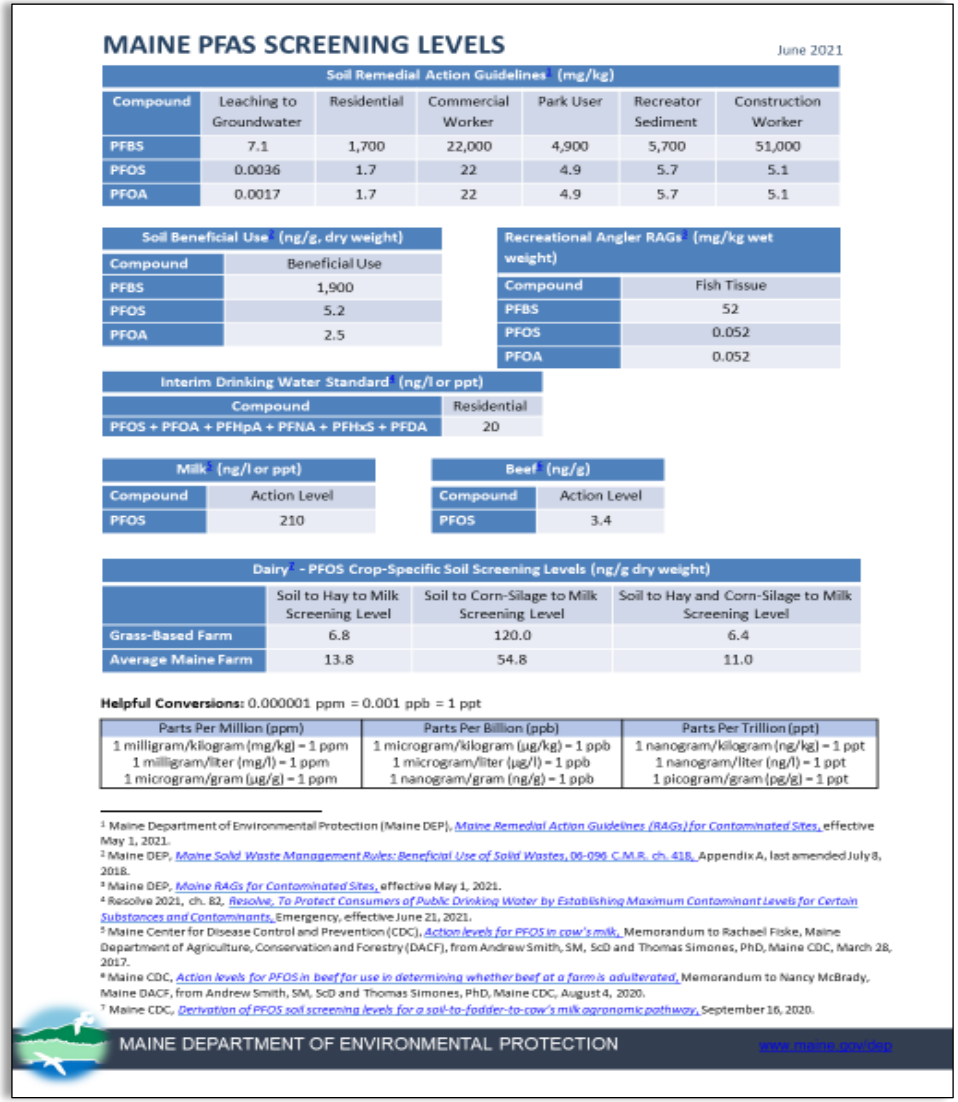
Public Resolve, 2021, Chapter 82, Effective June 21, 2021: *Resolve to Protect Consumers of Public Drinking Water by Establishing MCLs for Certain Substances and Contaminants*

Maine's Interim Drinking Water Standard = 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**

PFAS Screening Levels

- Screening levels
  - Soils
  - Recreational fishing
  - Milk
  - Beef
  - Dairy (to hay, to corn)
- Developed in coordination with Maine CDC and Department of Agriculture
- Updating soon



MAINE PFAS SCREENING LEVELS

June 2021

Soil Remedial Action Guidelines[1] (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[2] (ng/g, dry weight)

Compound	Beneficial Use
PFBS	1,900
PFOS	5.2
PFOA	2.5

Recreational Angler RAGs[3] (mg/kg wet weight)

Compound	Fish Tissue
PFBS	52
PFOS	0.052
PFOA	0.052

Interim Drinking Water Standard[4] (ng/l or ppt)

Compound	Residential
PFOS + PFOA + PFHpA + PFNA + PFHxS + PFDA	20

Milk[5] (ng/l or ppt)

Compound	Action Level
PFOS	210

Beef[6] (ng/g)

Compound	Action Level
PFOS	3.4

Dairy[7] - 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

[1] Maine Department of Environmental Protection (Maine DEP), *Maine Remedial Action Guidelines (RAGs) for Contaminated Sites*, effective May 1, 2021.
[2] 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.
[3] Maine DEP, *Maine RAGs for Contaminated Sites*, effective May 1, 2021.
[4] 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.
[5] 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.
[6] 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.
[7] 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

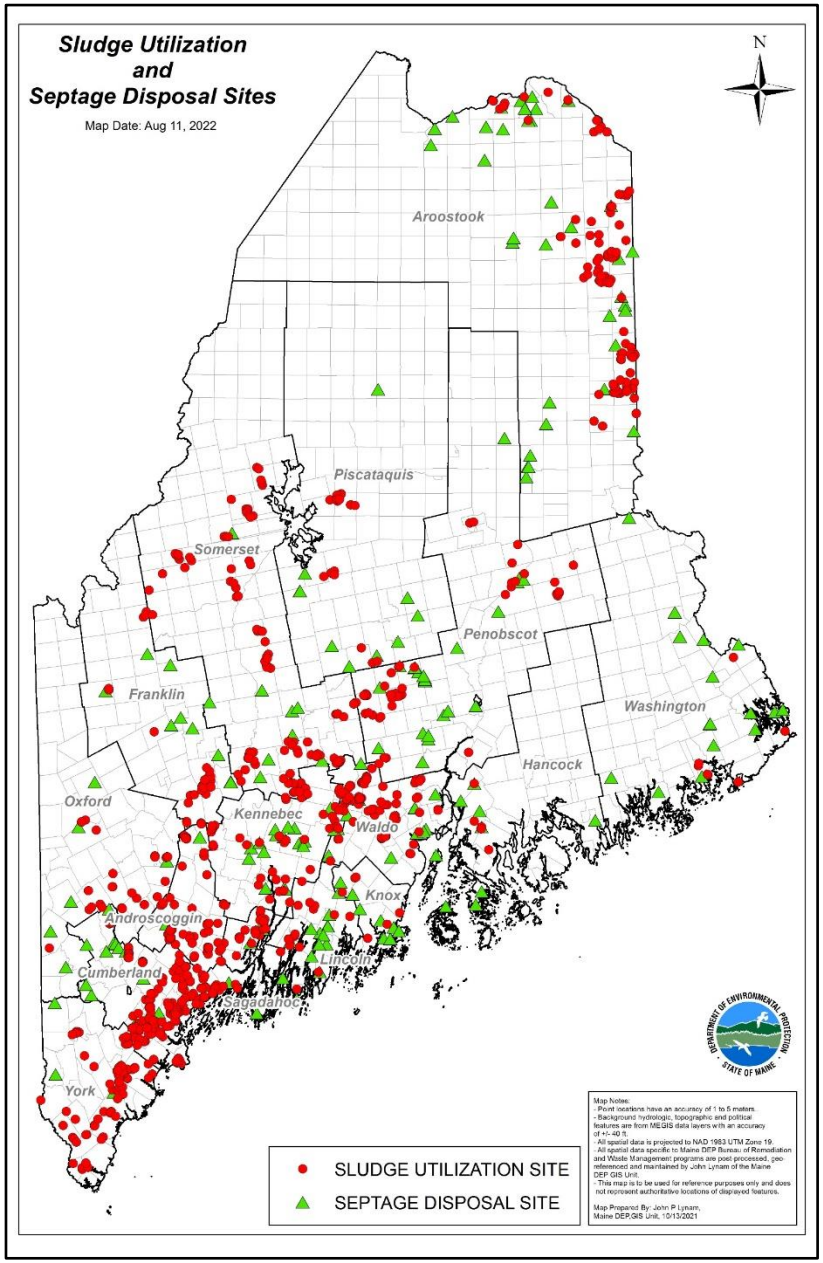
PFAS Investigation

Public Law, 2021, Chapter 478, Effective October 18, 2021:
An Act To Investigate Perfluoroalkyl and Polyfluoroalkyl Substance Contamination of Land and Groundwater

- Requires DEP to:
  - Conduct a PFAS soil & groundwater investigation for contamination derived from application of both sludge & septage
    - Half of all sites must be sampled by end of 2024; all by end of 2025
    - In addition to sampling, DEP provides and maintains water treatment systems for impacted private drinking water wells

PFAS Investigation
cont'd

- Over 700 sludge and septage application sites estimated in early 2021 (likely more)
- Sites often include multiple fields/locations crossing municipal boundaries
- Some sites were used by multiple generators – and sludge from multiple sources may have been applied to one location
- Thousands of data points, several decades of licensing information
- Current land ownership often different than from decades ago



Prioritizing Sampling Locations

- Sludge sites are grouped into four Tiers:
  - Volume of sludge land applied
  - Anticipated presence of PFAS in sludge
  - Proximity of known receptors
- Septage sites are managed separately
- Many sludge land applications sites are active agricultural operations
- Significant interagency coordination required

Tiers

- **Tier I** - sites where **10,000+ yd^3** or more of sludge was land applied, where **homes are within 1/2 mile**, and where **PFAS is likely** to be present in the sludge

- **Tier II** - sites where **5,000 - 10,000 yd^3** of sludge were land applied, where **homes are within 1/2 mile**, and where **PFAS is likely** to be present in the sludge
  - In cases where **homes are over 1/2 mile away**, a site may be downgraded to **Tier III** depending on distance and other hydrogeological factors. Likewise, a site may be elevated to **Tier I** if results from a **Tier II** site with similar source contributions show a greater than anticipated impact to the soil and water being tested

Tiers…cont'd

- **Tier III** - sites where **<5,000 yd^3** of sludge were land applied, where **homes are within 1/2 mile**, and where **PFAS is likely** to be present in the sludge
  - Likewise, a site may be elevated to **Tier I or II** if results from a **Tier III** site with similar source contributions show a greater than anticipated impact to the soil and water being tested

- **Tier IV -** sites where information gathered to date indicates that **no sludge was land applied**. Additional research and time will be needed to verify this information. Once identified, these sites may be placed in another Tier as appropriate

PFAS Investigation Process

- Review licenses/annual reports
- Develop site sampling and analysis plans (SAP)
- Schedule sampling events – coordinate with landowners
- Conduct sampling event/deliver samples to lab
- Obtain/review lab results
- Communicate results to landowner
- Evaluate need for bottled water/treatment
- Determine whether step-out investigation is warranted to find edge of PFAS plume

What we are learning: Groundwater Results

- Over 977 **private groundwater well** samples taken statewide:

PRELIMINARY Groundwater Results (Sludge-only) as of August 1, 2022				
Location	< 20 ppt	20 – 100 ppt	100 – 1000 ppt	> 1000 ppt
Fairfield Area (Fairfield, Unity Twp, Benton, Oakland)	59%	21%	11%	9%
Statewide non-Fairfield Area	80%	10%	7%	3%
Statewide (ALL)	69%	15.5%	9.5%	6%

- Results not uniform throughout Maine
- Lots to learn – only includes sludge site results, so far..

Leachate Testing

- Public Law 2021, Chapter 478 also requires landfills that collect and manage leachate to conduct periodic testing
  - Twice per year
- Informed landfills in September 2021

- Five rounds sampling required, spring and fall, ending fall 2023
- Report to Legislature due January 2024

What are we learning – LF Leachate

- Regarding landfills that “manage and collect” leachate only
- 2 rounds so far Fall and Spring
- Most results in same ballpark both Fall and Spring

Concentrations of PFOA range from 3.55 ng/L to 11,000 ng/L in both Fall/Spring samples

PFOA was detected in all samples in both Fall and Spring samples

Landfill Leachate Data – Spring 2022

FACILITY NAME	LOCATION	PFOA	PFOS	PFHpA	PFHxS	PFNA	PFDA
BRUNSWICK, TOWN OF (MSW)	BRUNSWICK	2400	530	860	440	140	170
HARTLAND, TOWN OF (SLUDGE)	HARTLAND	409	1820	124	621	10.1	4.58
WASTE MGT DISP SERV OF ME INC (SPECIAL WASTE)	NORRIDGEWOCK	1500	300	740	360	ND	ND
JUNIPER RIDGE LANDFILL (SPECIAL WASTE)	OLD TOWN	914	71.5	578	343	37	ND
SAPPI NORTH AMERICA, INC.	FAIRFIELD	1050	ND	531	ND	293	69.5
ECOMAINE (SPECIAL WASTE)	S. PORTLAND/SCARBOROUGH	1220	326	455	23.7	25.6	ND
PINE TREE LANDFILL (SPECIAL WASTE)	HAMPDEN	890	198	417	162	97.2	40.7
PIXELLE ANDROSCOGGIN JAY LANDFILL	JAY	690	660	210	110	ND	ND
ROCKLAND, CITY OF (DEMO)	ROCKLAND	665	282	288	372	41.1	19.7
SAPPI NORTH AMERICA, INC.	FAIRFIELD	716	ND	710	ND	138	60.8
KIMBERLY-CLARK LARSON CHAPMAN (SPECIAL WASTE)	SCARBOROUGH	862	257	337	24.3	23.1	ND
BATH, CITY OF (MSW)	BATH	204	122	75.9	81.7	22.7	10.7
ROCKLAND, CITY OF (DEMO)	ROCKLAND	117	177	44.6	148	4.19	ND
PIXELLE ANDROSCOGGIN JAY LANDFILL	JAY	150	220	40	7.7	6.8	1.9
PIXELLE ANDROSCOGGIN JAY LANDFILL	JAY	190	160	42	7	6	ND
FORMER AUGUSTA TISSUE LANDFILL (SPECIAL WASTE)	AUGUSTA	60.2	288	29.1	3.89	4.25	2.12
SAPPI NORTH AMERICA, INC.	FAIRFIELD	169	ND	89.4	ND	69.8	ND
SAPPI NORTH AMERICA, INC.	FAIRFIELD	113	ND	192	ND	ND	ND

Units: parts per trillion (ppt)

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 and/or nearby water supplies

- 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

Recap - Key Legislation

Focus on 6 laws from Maine's 130th legislature (2021-2022)	
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State-Owned Landfill Study

Public Resolve 2021, Chapter 172: *Resolve, To Address PFAS at State-owned Solid Waste Landfills*

Requires the Maine Department of Administrative and Financial Services, Bureau of General Services, to conduct a study of methods of treating leachate collected at two state-owned landfills to reduce the concentration of PFAS in the leachate

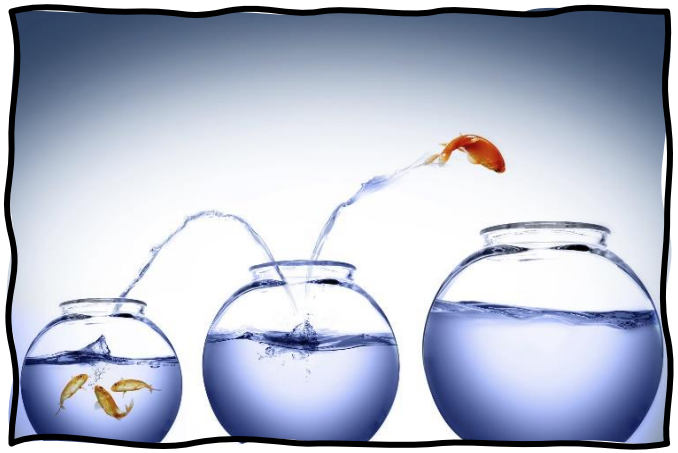
- Consider different treatment technologies
- Evaluate feasibility, timeframe, and costs
- Include stakeholders

2022 Sludge Ban

Public Law, 2021, Chapter 641, Effective August 8, 2022: *An Act To Prevent the Further Contamination of the Soils and Waters of the State with So-called Forever Chemicals*

- Prohibits the land application of sludge or sludge derived products as well as the sale and distribution of sludge and septage derived products (e.g., composts and fertilizers)
- Report on feasibility of enacting a ban on land application of septage (which occurs in Maine) – due January 2023
- Removed L.D. 1600 sludge and septage handling fee - $10/ton

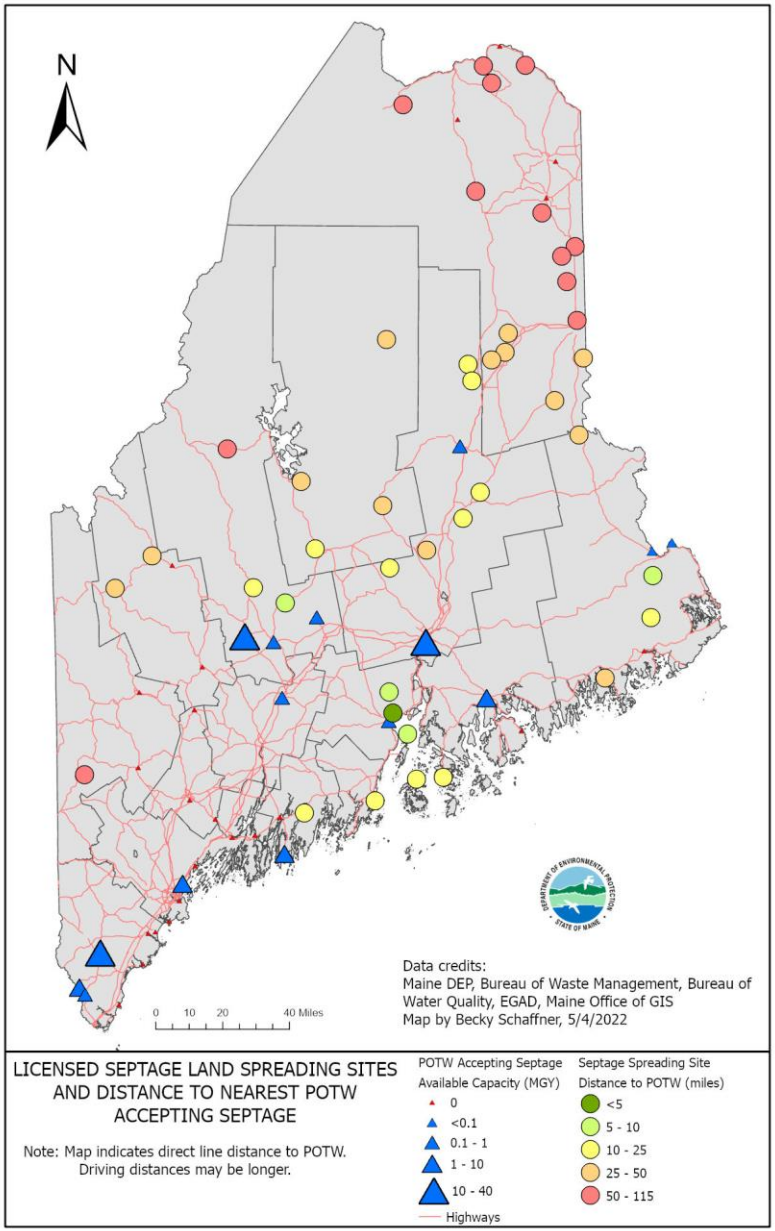
Sludge Ban - Early Challenges



- Unanticipated impacts:
  - Where to put the sludge?
  - Lack of landfill capacity or other disposal options
  - Increased disposal costs
  - Technology still in infancy regarding treatment, concentration, and destruction
  - Impacts to landscapers, some farmers, and home gardeners, other states
  - Wastewater operations perceived as problem
- Stakeholder participation underway

Where will the septage waste go?

- Coordinating with Bureau of Water Quality on 2023 report on disposal options to legislature
  - Moving towards septage ban
- Which POTWs have capacity to accept septage?
- Travel distance?
- What are the options?
  - Consolidation facility?



Bureau of Water Quality
2022 Effluent Sampling

- Under new authority of LD 1911 BWQ will require effluent sampling at approximately:
- 105 POTWs
  - All POTWs in Toxics Program (generally larger, lower dilution, or industrial contributors)
  - Spray Irrigation sites (effluent and ground water)
- 20 Non POTWs
    - Paper mills, manufacturers, car washes, septage processors

2022 Effluent Sampling...cont'd

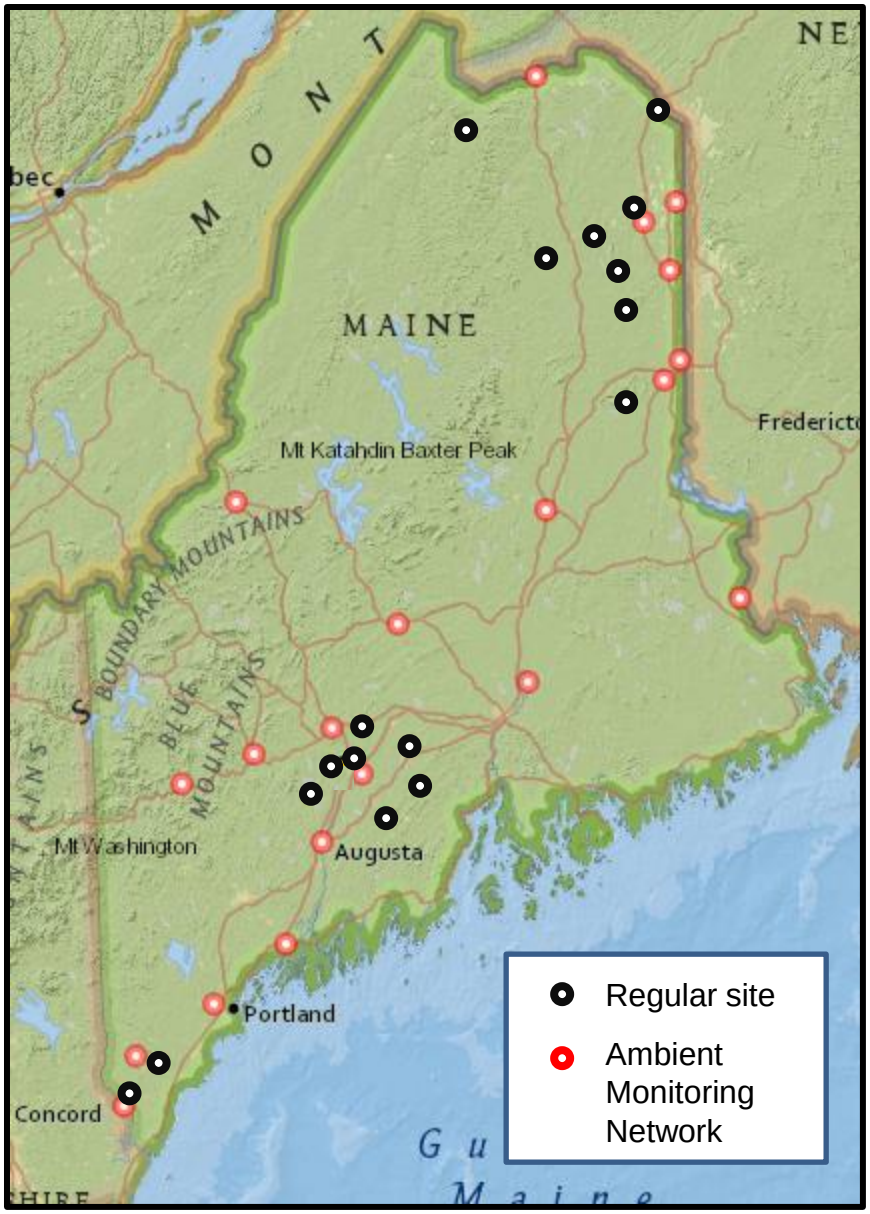
- Plan still under development
- DEP will pay for POTW sampling via ARPA funds
- Contract with laboratory
- Non-POTWs must pay for themselves
- Plan for monthly sampling for 10 months
- Sampling may be adjusted as data indicates
- First results expected in fall
- Results will inform if any future effluent limits are needed once EPA promulgates ambient water quality criteria (end of 2024)

Other Departmental PFAS Efforts

- Bureau of Water Quality
  - Effluent Sampling
  - Surface Water Sampling
  - Fish Tissue Sampling
- PFAS in Products
  - Food packaging
  - Reporting Requirements

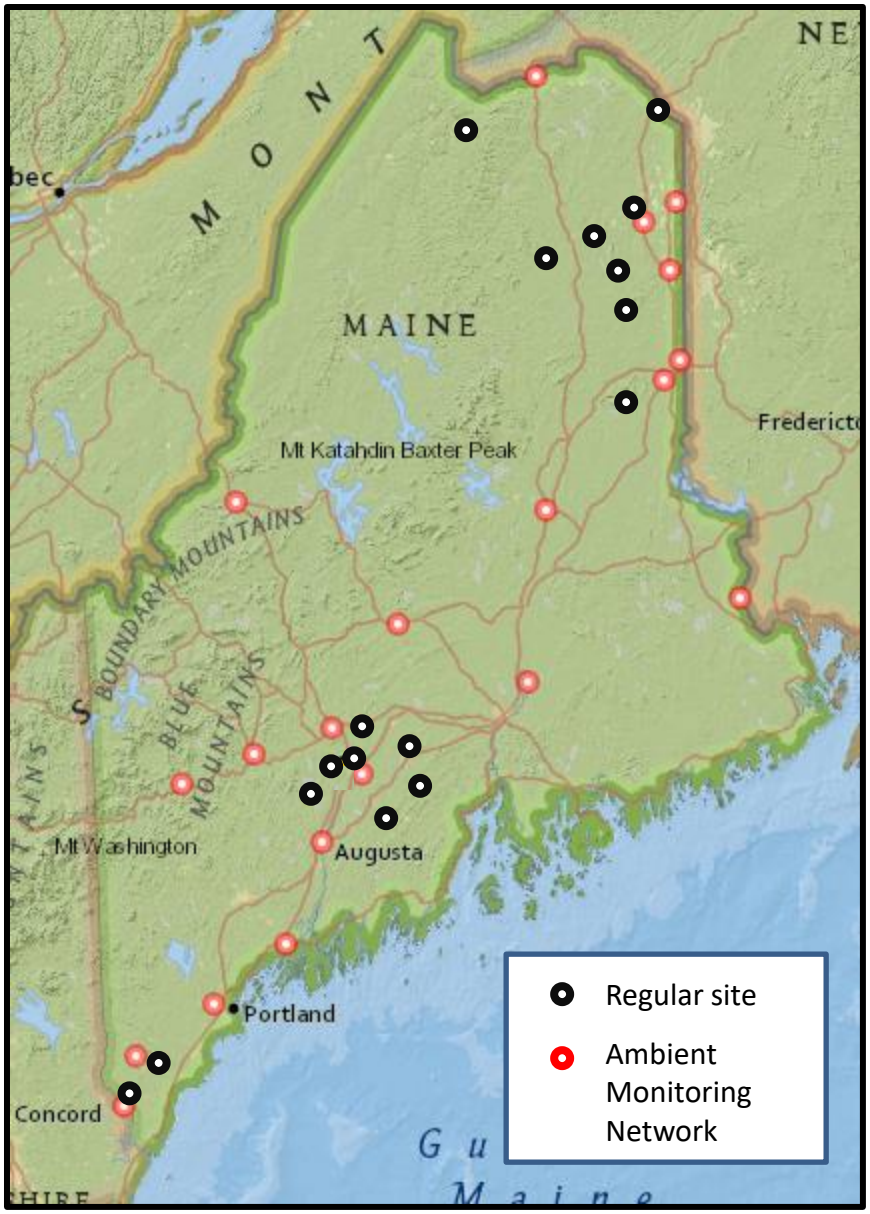
Bureau of Water Quality 2022 Freshwater PFAS Sampling

- Surface water samples at all sites (lakes and rivers)
- 10 fish per species for most sites
- 15 fish per species for some repeat sites
- No fish at a few ambient network sites because of past sampling



2022 Freshwater PFAS Sampling...cont'd

- Ambient PFAS Monitoring Network
  - statewide network of 20 sites that are upstream and downstream of discharges
- Regular Sample Locations
  - combination of repeat samples and new locations



Target Species

Brook Trout

Largemouth Bass

Smallmouth Bass

Black Crappie

White Perch

Northern Pike

Photo credit Connecticut DEEP

PFAS in Food Packaging

- **32 M.R.S. § 1733 (3-B)**, effective June 13, 2019: *An Act To Protect the Environment and Public Health by Further Reducing Toxic Chemicals in Packaging*
- DEP rules may prohibit use of packaging with intentionally introduced PFAS if safer alternative available in sufficient quantity and at comparable cost
- Following the initial WA study – Maine rule proposed to focus on wraps & liners, food boats, plates, and pizza boxes
- Rulemaking this year – major substantive
- Stakeholder meetings upcoming
- Will be in front of BEP by end of year

This Photo by Unknown Author is

Intentionally Added PFAS in *all* Products

- **38 M.R.S. § 1614 effective July 15, 2021**: *An Act to Stop PFAS Substances Pollution*
- These products with intentionally added PFAS are **banned** from sale/distribution starting 1/1/2023
  - Carpets & rugs
  - Fabric treatments
- Manufacturers of *all* products with intentionally added PFAS must **notify** the DEP by 1/1/2023
- Notifications will be collected and integrated into the Interstate Chemicals Clearinghouse (IC2) www.theic2.org
- This information will be available to ALL states! No need to recreate data collection efforts if adopted by your state.

Intentionally Added PFAS in *all* Products

- All products with intentionally added PFAS (unless the PFAS is determined by rule to be unavoidable) will be **banned** for sale/distribution starting 1/1/2030
- Rules will be developed to determine what is unavoidable use
- Rulemaking this year - major substantive; Stakeholder input – June 30, 2022
- DEP website FAQs online
- Still need to hire program manager

Lessons Learned

- It takes time to:
  - Create program structure
  - Understand staff roles and responsibilities
  - Clarify partner agency roles and responsibilities
  - Ensure consistency in direction of the program
  - Find and locate home and landowners
  - Get permission to access property and obtain data
  - Schedule sampling events, installation events, monitoring events
  - Develop data collection/user friendly information (maps)
  - Obtain and review lab data
  - Get contracts through the state process
  - Determine how to manage self-testers

Lessons Learned…cont'd

- Communication is critical
  - Towns/communities, media, groups, agencies, homeowners, landowners
  - Type of communication is important (phone, writing)
  - Dissemination of information (website, GIS, data requests)
  - Public expectations high and not always realistic
  - Not having answers to questions; how to explain what soil results mean?
- The unexpected will come up
  - Changing landscape of regulation and technology
  - Public and legislative reactions
  - Nonstop information requests and inquiries – including FOAA
  - Unintended impacts to agriculture and basic infrastructure (wastewater, waste, drinking water), hunting, fishing, and perhaps more

Lessons Learned…cont'd

- Coordination with other agencies
  - Department of Agriculture, Conservation and Forestry
  - Inland Fisheries and Wildlife
  - Maine Center for Disease Control and Prevention

Contact:

pfas.dep@maine.gov

www.maine.gov/dep/spills/topics/pfas/index.html

www.maine.gov/dep