



PFAS Briefing for the Board of Environmental Protection

October 21, 2021

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MAINE DEPARTMENT OF ENVIRONMENTAL PROTECTION

Protecting Maine's Air, Land and Water

Overview

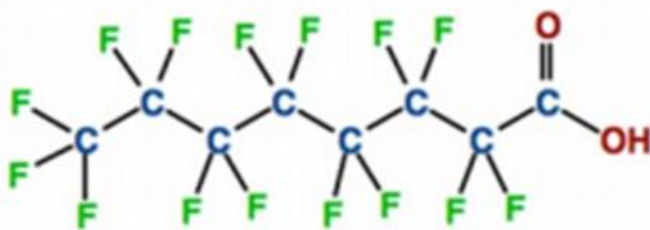
- **PFAS Refresher**
- **Funding**
- **Product Regulation**
- **BRWM Activities**
- **BWQ Activities**
- **Future Rulemaking**



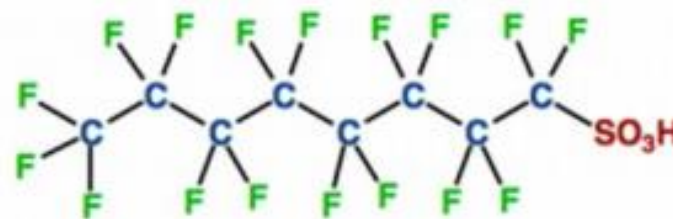
PFAS Refresher

PFAS = per- and poly-fluoroalkyl substances

“means substances that include any member of the class of fluorinated organic chemicals containing at least one fully fluorinated carbon atom” (32 MRS §1732, 38 MRS §1612)



PFOA - perfluorooctanoic acid



PFOS - perfluorooctanesulfonic acid

PFAS Refresher

Health Impacts

- 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



PFAS Refresher

Where have we found PFAS in Maine?

- **Agricultural Sites**
- **Surface and Groundwater Sites**
 - Public Water Systems and Private Drinking Water Wells
 - Surface Water Ambient Toxics Monitoring (SWAT)
- **Waste Management Sites**
 - Landfills
 - Sludge and Septage Spreading Sites
- **Contaminated Sites**
 - Department of Defense Sites
 - Superfund
 - Uncontrolled Sites (e.g., AFFF and other sources)



Product Regulation Firefighting Foam (AFFF)

- Prohibits discharge of AFFF for testing and training
- Requires reporting of discharges to the environment
- Framework for notice and recall of AFFF
- Prohibits manufacture, sale and distribution of intentionally added PFAS in foam



Product Regulation Reporting and Use Prohibition

- Requires manufacturers of products with intentionally added PFAS to report to DEP starting January 2023
- Bans PFAS use in carpets, rugs, fabric treatments as of January 2023
- Bans all intentionally added PFAS in products in 2030




BRWM Activities General Overview

- Then and now...
- Legislation & Implementation
- Updates on specific Sites
 - Fairfield
 - Cutler
- Interagency and stakeholder coordination
- Other Activities
- Longer term considerations



PFAS Refresher Regulatory Levels

- EPA drinking water Health Advisory PFOA, PFOS or (PFOA + PFOS) = 70 ppt
- Screening levels were developed with help from  Maine CDC

MAINE PFAS SCREENING LEVELS

June 2021

Compound	Soil Remedial Action Guidelines (mg/kg)					
	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 - 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. 41B](#), 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 McBrydy, 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-farmer-to-cow's milk agronomic pathway](#), September 16, 2020.



MAINE DEPARTMENT OF ENVIRONMENTAL PROTECTION

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BRWM Activities

Then - six months ago...

- DEP was following the EPA Health Advisory of 70 ppt for PFOA, PFOS, and PFOA + PFOS
- We had identified multiple pathways for PFAS contamination
 - Remediation sites (mostly from AFFF)
 - Closed landfills (dependent on industrial inputs)
 - Application of biosolids (also dependent on industrial inputs)
- We had started the Fairfield investigation
- We had generated over 52,000 EGAD records



BRWM Activities

Where we are now...

- DEP using new Maine Interim Drinking Water Standard of 20 ppt for the sum of 6 PFAS
- Trying to incorporate this into Federal sites
- Fairfield area sludge/septage investigation
- Implementation of LD 1600 underway
- Regular interagency and stakeholder meetings
- New technologies investigated
- Over 91,000 EGAD records now generated



BRWM Activities

Legislation & Implementation

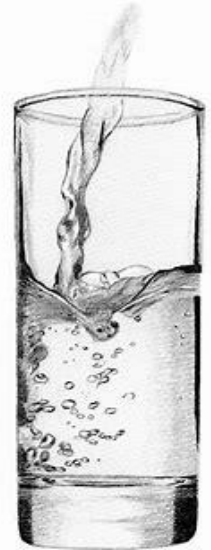
- Lots of changes impacting BRWM!
- LD 129 – Interim Standard (drinking water)
- LD 1600 – PFAS investigation
- LD 363 – Statute of Limitations
- LD 780 – PFAS = Hazardous Substance



BRWM Legislation & Implementation

LD 129 – Resolve to Establish MCL

- Emergency legislation – effective June 21, 2021
- Requires DWP to set interim standards for (drinking water)
 - No more than 20 ng/L (or ppt) for the sum of 6 pfas: PFOA, PFOS, PFNA, PFHxS, PFHpA, and PFDA
- FINAL rule for MCLs must be proposed by 12/31/23; Final by 6/1/2024.



BRWM Legislation & Implementation

LD 129 – Resolve for Interim MCL

- Also requires monitoring and sampling of community water systems and non-transient noncommunity water systems

Division of Environmental and Community Health
Maine Center for Disease Control & Prevention
A Division of the Maine Department of Health and Human Services

[DWP Home](#) | [Public Water Systems](#) | [Drinking Water Consumers](#) | [Partners](#) | [Professionals](#)

Coronavirus Disease 2019 (COVID-19)

[DHHS](#) → [MeCDC](#) → [Environmental and Community Health](#) → [Drinking Water](#) → [Public Water Systems](#) → [Testing for PFAS in Drinking Water](#)

Drinking Water Program	<h3>Testing for PFAS in Drinking Water</h3> <p>Per- and polyfluoroalkyl substances (PFAS) are man-made chemicals that have been widely used since the 1940s in consumer products and industrial applications. Due to their widespread use and persistence in the environment, most people in the United States have been exposed to some level of PFAS. There is evidence to suggest that continued exposure above specific levels to certain PFAS may lead to adverse health effects.</p> <p>With the passage of S.P. 64-L.D. 129 (Resolve, To Protect Consumers of Public Drinking Water by Establishing Maximum Contaminant Levels for Certain Substances and Contaminants), the Maine legislature has mandated that all community public water systems, and non-transient, non-community schools and child care facilities sample their finished drinking water for PFAS.</p>
Public Water Systems	
Consumers	
Partners	
Professionals	
Quick Links	
Compliance	
Field Inspection	
Water Resources	
Site Map	
Lead Testing in School Drinking Water	



New law – PFAS sampling LD 1600

- Effective October 18, 2021
- Requires DEP to:
 - Conduct PFAS investigation for contamination derived from application of sludge & septage;
 - Ensure landfill leachate is sampled;
 - Establish Land Application Contaminant Monitoring Fund (LACMF) and collect fees on sludge handling for this fund.



LD 1600



- Half of all sites must be sampled by end of 2024; all by end of 2025.
- Updates are required to the legislature in January of 2023 and every 2 years thereafter on contamination found and how monies spent



LD 1600

Staffing and Funding

- 11 Full Time Equivalents
- 6 Limited Period Positions
- Other money:
 - \$20M from General Fund for the sampling, treatment and remediation of PFAS
 - \$5M from Maine Jobs and Recovery Plan



LD 1600

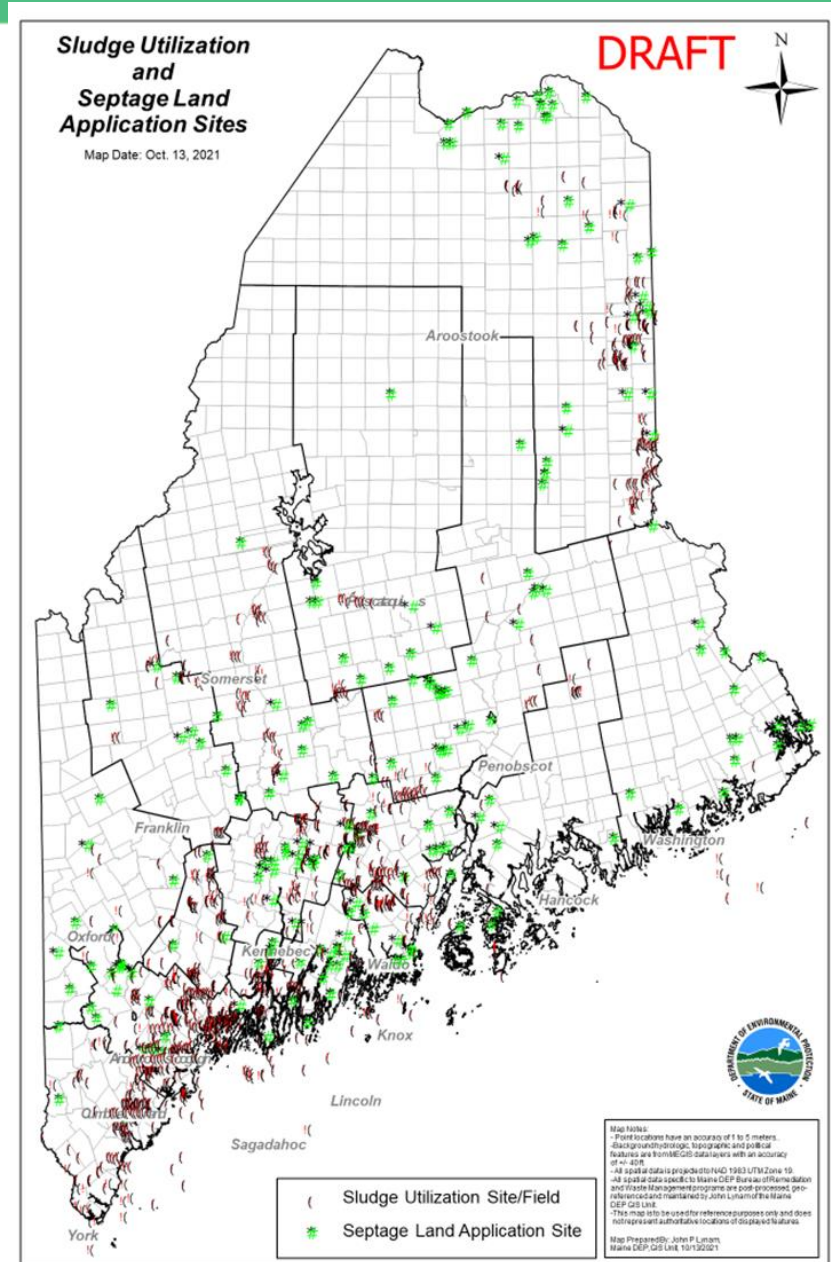
- Prioritizing Sites statewide based on:
 - Volume of sludge or septage land applied at a location;
 - Anticipated presence of high levels of PFAS from that application; and
 - Proximity of known receptors
- DEP must also coordinate with DACF to prioritize Sites that are in active agricultural/commercial use
- Gain permissions/access to sites



LD 1600

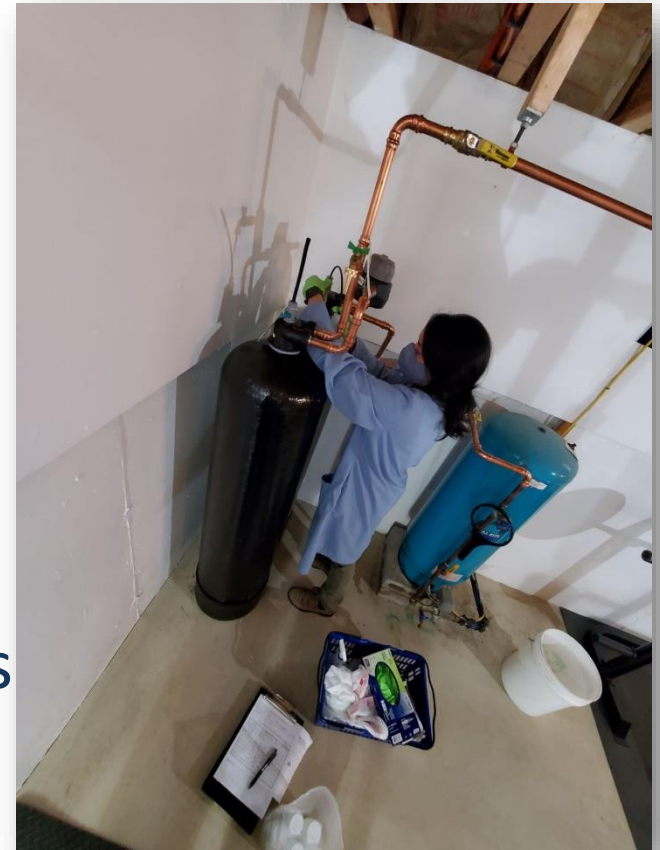
Sampling Locations

- Over 700 sludge and septage application sites
- Sites often include multiple fields and locations crossing boundaries
- Thousands of data points and decades of licensing information



LD 1600

- Staff teams mobilized to conduct soil and groundwater sampling starting November
- This will include private drinking wells
- Will require extensive interface with concerned citizens
- Communication is critical



LD 1600

- DEP expects to find private wells with drinking water levels exceeding the Interim Standard for Maine (20 ppt sum of 6)
- Staff will work with residents to address the problem



LD 1600

- **On September 1, 2021 DEP sent a letter to most active landfills requiring that sampling for PFAS be conducted and the results submitted to DEP**
- **5 samples are required one starting this Fall, then one each Spring and Fall through 2023**
- **DEP is required to report results to the legislature in 2024 along with recommendations**



LD 1600

- DEP must set up fund to collect sludge and septage handling fees (LACMF)
- Fees must be assessed starting January 1, 2022
- BUT...Rules must be promulgated to describe:
 - How the fees will be collected
 - How the fund will be used



LD 363 – Statute of Limitations

- Effective October 18, 2021
- Nothing required for DEP, but...
- Start date for private claims now begins on the date the plaintiff discovers or reasonably should have discovered the PFAS harm or injury (not when it was applied or released which could have been decades ago)



LD 780 – Uncontrolled Sites

- Effective October 18, 2021
- Definition of hazardous substance consistent with Federal CERCLA (includes contaminants of concern such as PFAS)
- Allows a Maine site contaminated with PFAS to be designated as an uncontrolled site



Specific Site Updates Fairfield

- Field sampling continues
- 411 water supplies sampled
- 191 found to exceed
 - Highest at 39,715 ppt
- 121 filters installed; 42 filters pending
- Public meetings (2); upcoming Q&A Session 11/18
- Active media interest



Specific Site Updates Cutler

- Federal CERCLA site – Navy is lead RP
- PFAS found to be a contaminant of concern
- Navy providing filtration systems and bottled water to “some” residents
 - Not following Maine’s Interim Standard
- Maine is now providing filtration systems to residents at cost to Maine
 - Systems and processes are different



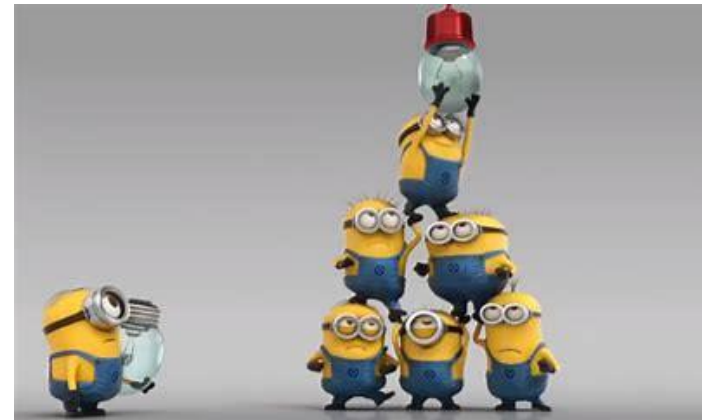
BRWM Interagency Coordination

- Monthly meetings with other State agencies
 - Drinking Water Program
 - Inland Fisheries & Wildlife
 - Center for Disease Control
 - Agriculture, Conservation and Forestry



BRWM Stakeholder Coordination

- Monthly meetings with Defend our Health (DOH) and Clean Action Works (CAW) starting in June
- Maine Water Environment Association (MEWEA) meetings every 2 months starting in August
- Valuable feedback
- Relationship building



BRWM Activities

- Other BRWM Activities
 - Leaching to Groundwater study
 - Background levels of PFAS study
 - Technical trainings
 - Exploring new technologies



BRWM final Considerations

- Some sites hard to identify any sources – may have to become uncontrolled sites
- PFAS disposal still a big question – PFAS not a hazardous waste, but still difficult to get rid of
- Effective alternatives for AFFF needed
- Source reduction critically important – will take time before Maine's LD 1503 prohibits PFAS in products
- Long term costs for investigation





PFAS Update Bureau of Water Quality

Brian Kavanah, Director BWQ

MAINE DEPARTMENT OF ENVIRONMENTAL PROTECTION

Protecting Maine's Air, Land and Water

PFAS Issues Overview

- **Ambient Monitoring**
 - Water
 - Fish Tissue
- **EPA efforts**
- **Effluent**

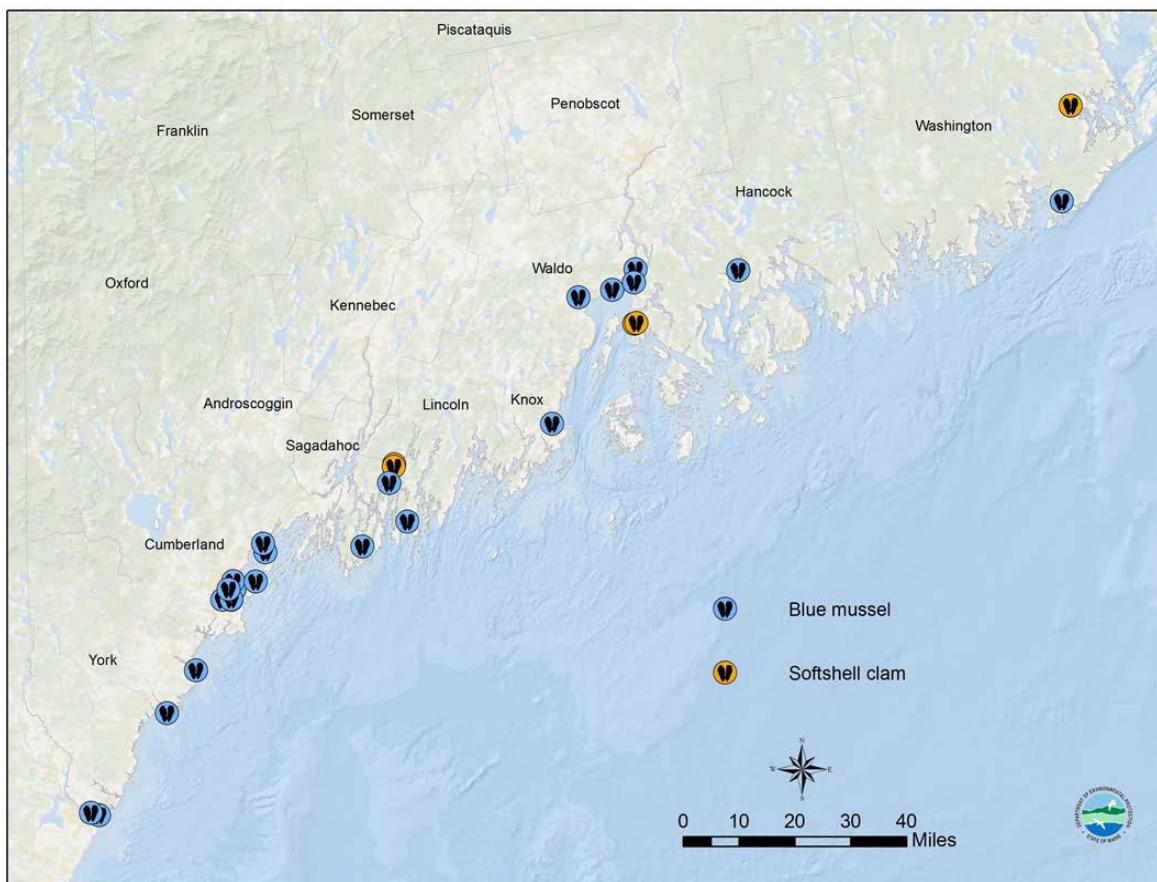


Ambient Monitoring

- Surface Water Ambient Toxics (SWAT) Program
- Fish tissue sampling completed in 2019 – 2020
- <https://www.maine.gov/dep/publications/reports/index.html>



SWAT 2019-20 Blue Mussel and Softshell Clam Sites

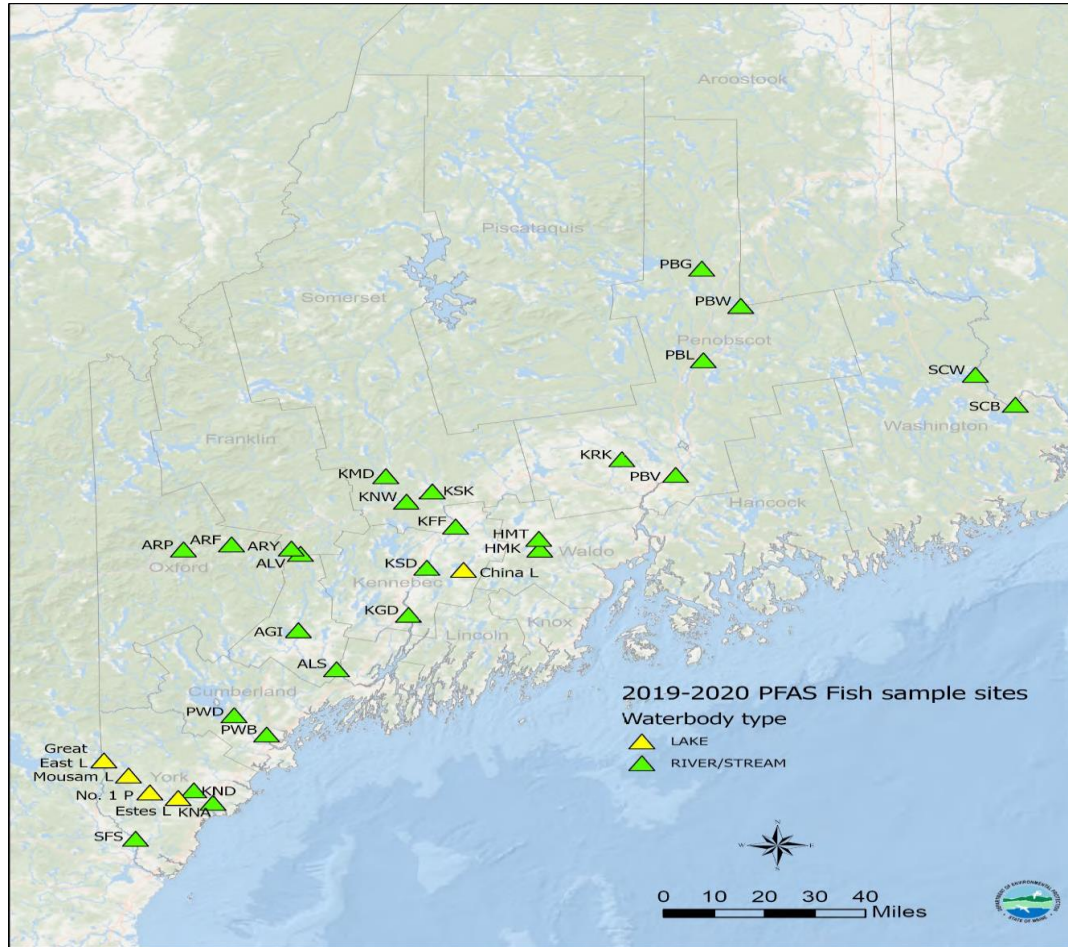


PFAS Marine Sampling (2019 & 2020)

- Softshell clam edible tissue
 - 3 sites (non detect)
- Blue mussel tissue
 - 23 sites (just above reporting limits, below the MeCDC Fish Tissue Action Level FTAL)



SWAT 2019-2020 PFAS Fish Tissue Sample Sites



Fish Tissue 2019 & 2020

Location	Result
Androscoggin	Well below FTAL
Half Moon Stream	Well below FTAL
Kenduskeag	Well below FTAL
Kennebec	Well below FTAL
Kennebunk	Well below FTAL
Penobscot	Well below FTAL
Salmon Falls	Well below FTAL
St. Croix	Well below FTAL



PFAS River Sampling – 2020 (cont.)

- **Presumpscot River below Westbrook:**
 - PFOS exceeded the MeCDC FTAL in fish
 - Me CDC FTAL:
 - = 79.0 ppb for protection of the general population
 - = 34.1 ppb for protection of sensitive populations

Presumpscot results = 35.7 ppb (mean)



PFAS River Sampling – 2020 (cont.)

- **Mousam River** - Repeat study confirmed previous FT results:
 - negligible PFOS in the headwaters in Mousam Lake
 - elevated levels in Number One Pond in downtown Sanford
 - levels exceeding the MeCDC FTAL in Estes Lake below Sanford.
 - Estes Lake results = 38.9 ppb & 38.0 ppb (mean)



2022 Sampling

- Additional SWAT sampling
- EPA grant for additional sampling
 - ambient
 - fish tissue
- Evaluate results based on:
 - drinking water threshold = 20 ppt
 - MeCDC FTAL = 79.0 ppb & 34.1 ppb
- Results will inform future effluent sampling



EPA Efforts

- States rely heavily on EPA for:
 - Test methods (just released draft method)
 - Effluent Limitation Guidelines (ELG) (technology based discharge limits)
 - Development of water quality criteria (WQC) for toxics
 - Aquatic life
 - Human health



EPA Efforts (cont.)

- EPA just released PFAS Strategic Roadmap: 2021-2024
- Multimedia plan
 - Research
 - Restrictions
 - Remediation



EPA Efforts (cont.)

- EPA issued ELGs for manufacturers of PFAS.
- Other ELGs likely/may be developed:
 - Organic chemicals, plastics, synthetic fibers
 - Metal finishing
 - Electronic components
 - Landfills
 - Plastic molding/forming
 - Electroplating
 - Textile mills
 - leather tanning/finishing
 - paint formulating



EPA Efforts (cont.)

- EPA developing water quality criteria (WQC) for PFAS.
- Aquatic life – Winter 2022
- Human Health – Fall 2024



Effluent Treatment

- PFAS not treated via standard wastewater secondary treatment technology.
- Additional tertiary treatment necessary.
- Anson Madison Sanitary District installing a system.
 - DEP providing partial funding via CWSRF and ARPA.



Effluent Treatment (cont.)

- ARPA funds may incentivize additional advanced treatment at other POTWs.
- Close the loop:
 - Advanced treatment for effluent
 - Disposal of treatment media at secure landfill
 - Disposal of sludge at secure landfill
 - Treatment of landfill leachate at POTW or landfill



Future

- Evolving issue.
- Consulting with EPA.
- Consulting with other NE states.
- Monitoring data will inform additional monitoring/requirements.
- Regulations will evolve with additional time and information.



Future Rule Proposals

- LD 1600 Sludge Handling Fees and LACM Fund coming in 2022
- Chapter 418, Appendix A revisions – to reflect new data from studies and interim drinking water standard
- Product reporting rules





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