

The Influence of PFAS Regulations on Sediment Disposal

Presented by

Sarah LaRoe, PhD

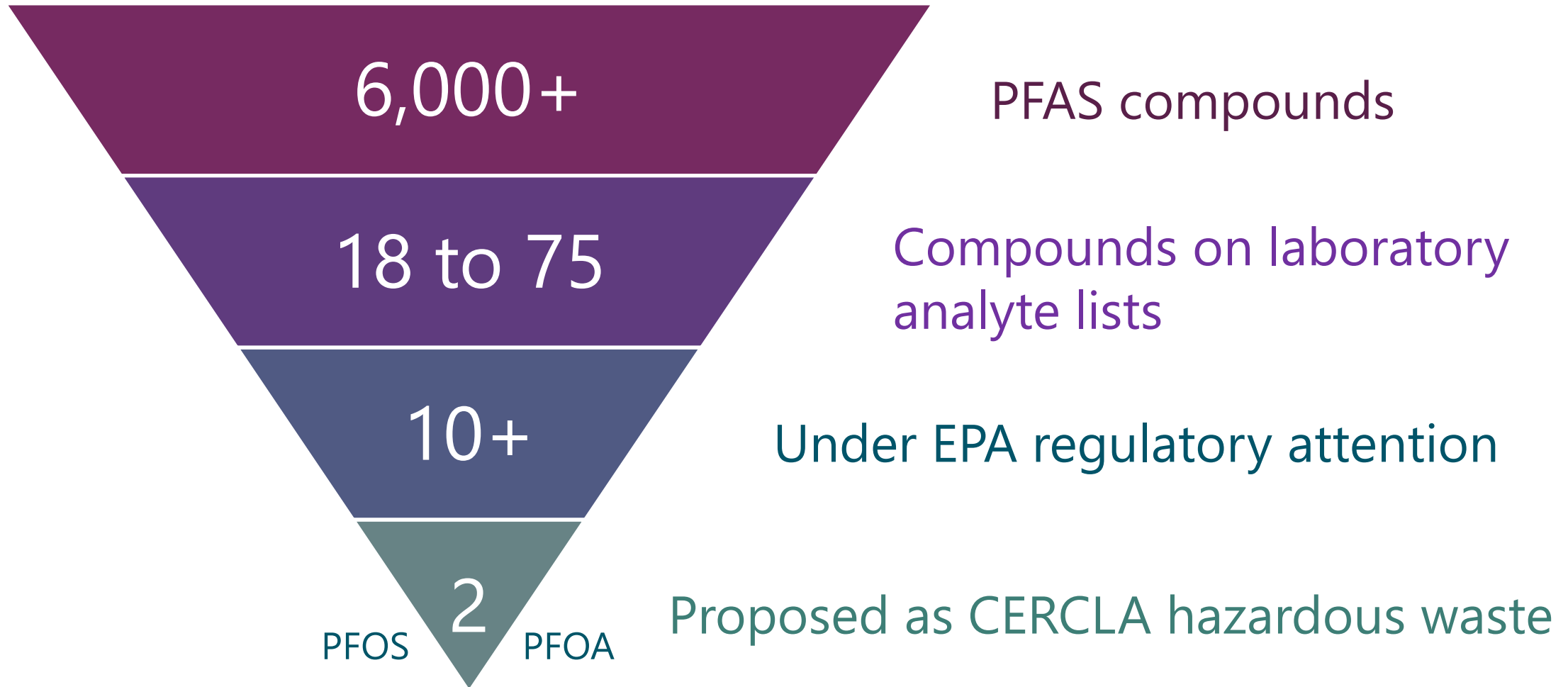
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Per- and Polyfluoroalkyl Substances (PFAS)



PFAS Sources

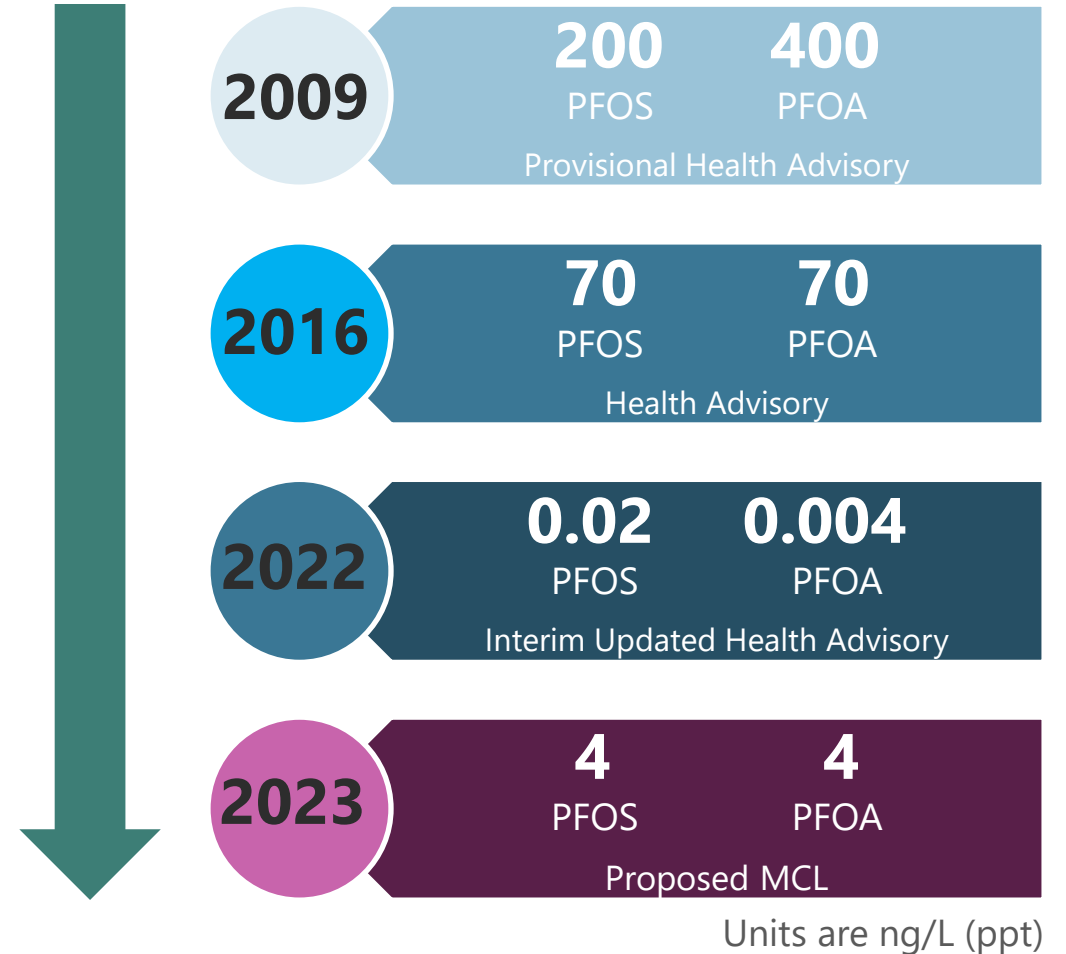
- Aqueous Film Forming Foam
 - Military installations
 - Civilian airports
 - Petroleum refineries
 - Firefighting training areas
- Landfills
 - Industrial or domestic
 - Leachate
- Manufacturers Using Surface Coatings
 - Chrome plating
 - Textiles and leather
 - Paper products
 - Electronics
- Wastewater Treatment Plants
 - Industrial or domestic
 - Land-applied biosolids



Source: open access images – bing.com

Federal Regulatory Activity – Drinking Water

- First subject of EPA attention was drinking water
- Health Advisory (HA) levels have been revised downward
- HAs are not enforceable
 - Jurisdictions are using HAs as cleanup levels in the absence of other guidelines
- Maximum Contaminant Level (MCL) is enforceable once finalized





Completed Federal Regulatory Activities PFAS Strategic Roadmap*

Established national PFAS testing strategy

Requirements for toxicity and occurrence testing

Set Regional Screening Levels

Triggers further site investigations

Proposed CERCLA designation of PFOS and PFOA

Final decision in Fall 2023

Considering CERCLA designation of at least seven additional PFAS

*List is not exhaustive



CERCLA (Superfund)

Comprehensive Environmental Response, Compensation, and Liability Act

Details Unclear



Gaps in Federal CERCLA Guidance

01

No testing requirements for dredged material

02

No concentration criteria that triggers special disposal

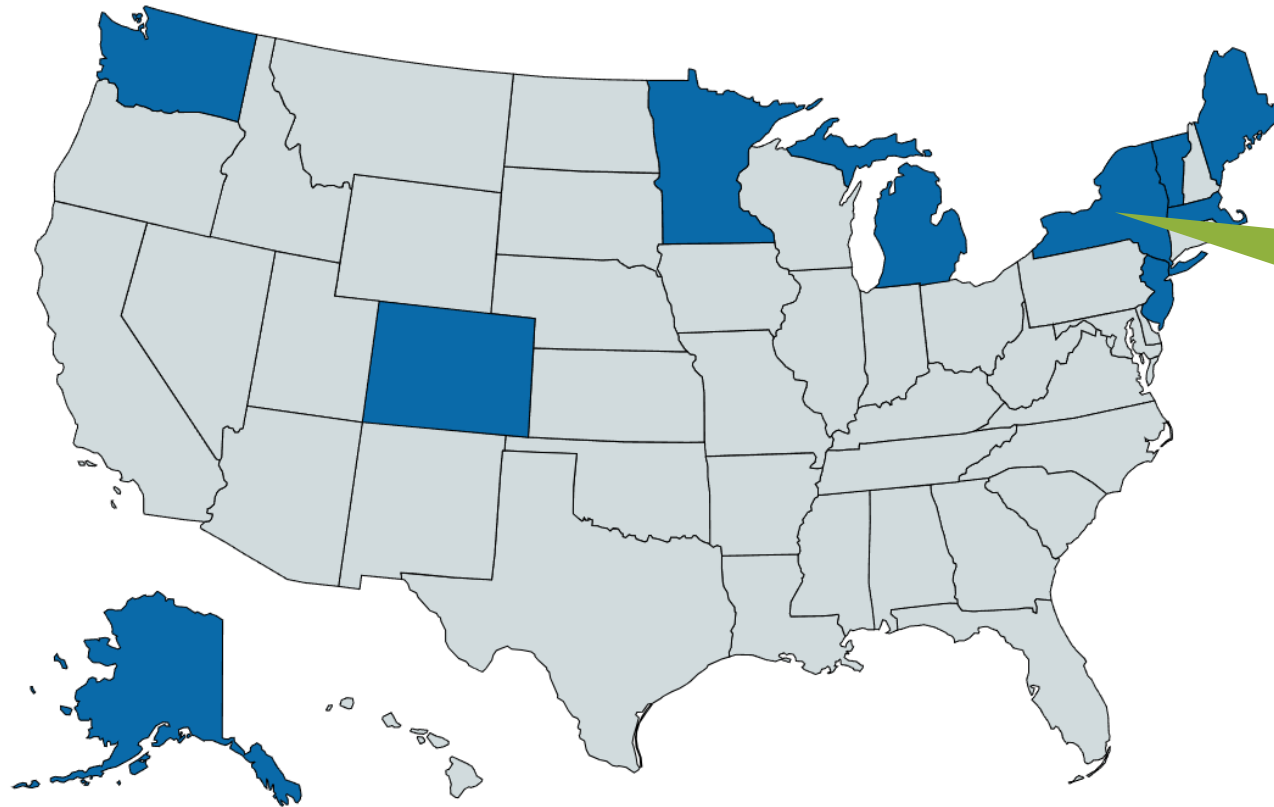
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No guidance on disposal options for PFAS-containing material

Additional guidance expected December 2023

State Regulatory Activity

The states in blue list PFAS as a hazardous substance



Example – New York (2016)
6+ State Superfund Sites
Proposed Soil Cleanup Objectives
PFOS = 3.7 ng/g
PFOA = 1.1 ng/g

As of March 2023, information compiled by ITRC and online

PFAS Soil Background Occurrence

PFOA (ng/g)	Vermont	New Hampshire	Maine
Maximum	4.9	4.1	5.29
Median	0.4	0.8	Not Reported
Percent Detect	91%	96%	65%

PFOS (ng/g)	Vermont	New Hampshire	Maine
Maximum	9.7	5.4	4.35 (Urban) 5.32 (Non-Urban)
Median	0.7	1.0	Not Reported
Percent Detect	100%	100%	81% (Urban) 63% (Non-Urban)

Sediment studies by Guilherme Lotufo (guilherme.lotufo@usace.army.mil)



Work in progress on sediment background by USACE

Preliminary survey



PFAS found in 26/26 sediment samples

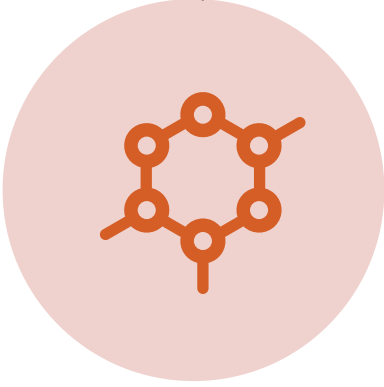
Considerations for Dredged Material Handling

Internal Discussion

Regulatory Agency Discussion



Should We Test for PFAS?



What Compounds Should We Test for?



What Levels Will Trigger Special Disposal?



Example Dredge Management Approach

Mississippi River Lower Pool 2

USACE DMMP 2020

- PFAS in sediment: <1 to 3 ng/g
 - Minnesota Soil Reference Values for PFAS = 330 to 63,000 ng/g
- No special PFAS measures suggested for the sediment
- Tentatively selected plan: placement of dredged sediment into former mining pit
- Some material to be made available for beneficial use



Figure: U.S. Army Corps of Engineers, 2020. Pool 2 Dredged Material Management Plan.

Liability



Chain of Custody



Verify Closed-Loop System



Certificate of Disposal

Current Disposal Options for Dredged Material

Landfills

RCRA Subtitle D

- RCRA = Resource Conservation and Recovery Act
- Traditionally accepted wastes that may contain PFAS
- Many do not accept PFAS now

RCRA Subtitle C

- Can provide liability protection and certificates of disposal

TSCA

- TSCA = Toxic Substances Control Act
- No current procedures for PFAS

Liability



Temperature



Stack Emissions Controls



Certificate of Destruction

Current Disposal Options for Dredged Material

Incineration

Non-Hazardous

Cement Kiln

Hazardous Waste

- Extensive EPA or State permitting requirements

TSCA

- RCRA permitted for hazardous materials

Maximum Achievable Control Technologies (MACT)

- RCRA permitted with additional MACT certification

Current Disposal Options for Dredged Material

Liquid Waste Considerations

Treatment Technology

- Depends on concentration and composition

Discharge Criteria

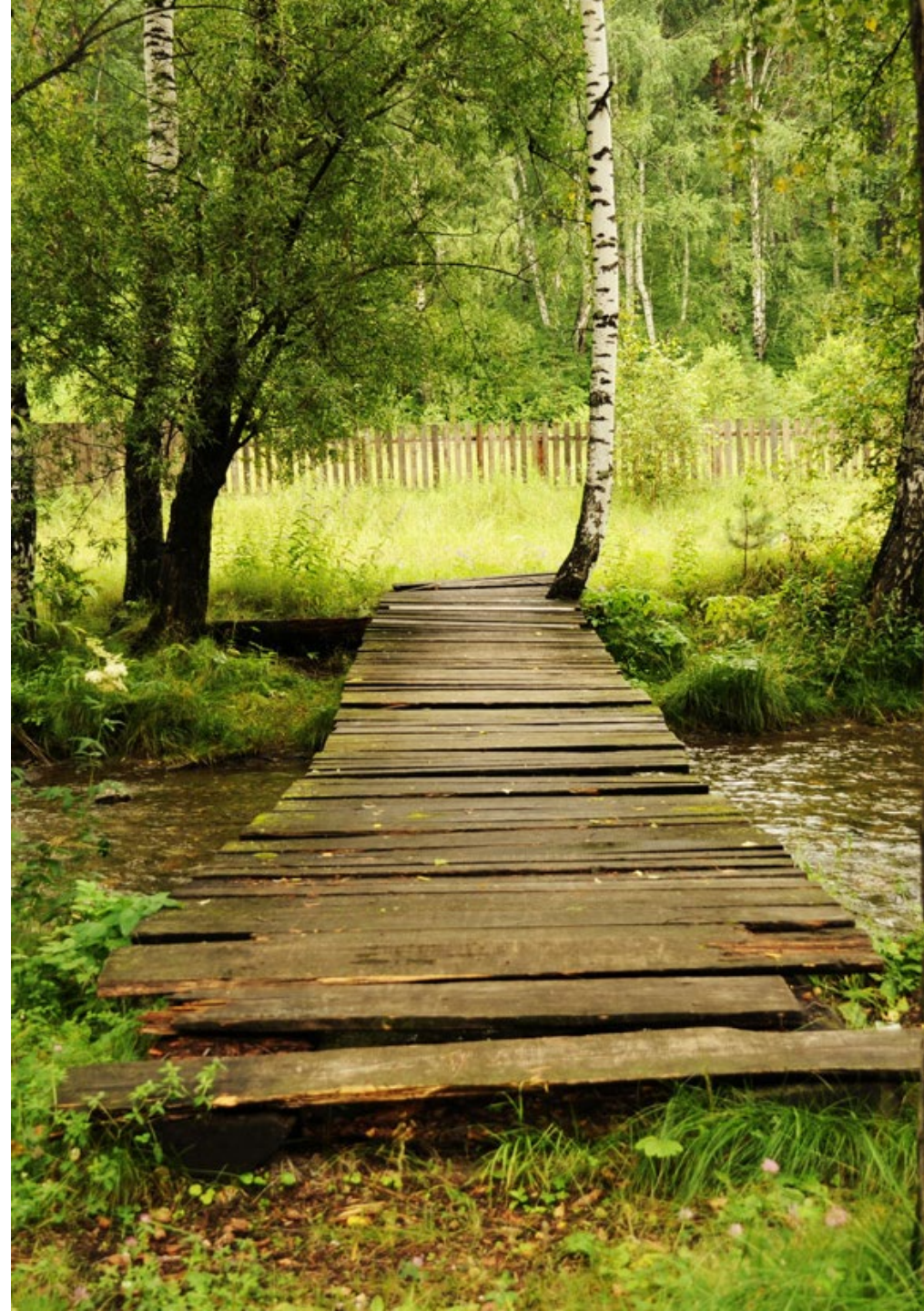
- Technologies can reach non-detect

Disposal of Spent Media

- Can be disposed of with dredged material

Conclusions

- PFAS regulations are evolving rapidly
- Guidance and practical implementation lag behind
- Dredged material will likely be subject to PFAS regulations in the near future
- Background levels suggest PFAS is widespread
- Proactive strategies are needed for handling regulatory uncertainties



Thank you

to AnnieLu DeWitt and
Clean Harbors for their
contributions on the PFAS
disposal options





What questions
do you have?