

The background of the slide is an abstract, textured composition of brushstrokes. The top portion is dominated by various shades of blue, ranging from light sky blue to deep, dark navy. Below this, there are broad, sweeping strokes of vibrant green and teal. The bottom section features darker, more muted tones, including brown, black, and dark green, suggesting a landscape or perhaps a cross-section of earth. The overall effect is dynamic and organic.

Remediation Roundtable

June 21, 2022

Remediation Roundtable Agenda

Announcements

- Verifications: Applicable Date

Updates

- Brownfield Program
- Release-Based Clean Up Program Regulation Development

Presentations

- Road Salt: More Than Just A Grain of Salt
- Remediation Files Scanning Project

Updates: part 2

- PFAS Action Plan



New Staff Arrivals



Ryan Mowrey
North Central District



Kelsey Shields
North West District



Geeta Dahal
Technical and Compliance
Support



Transmittal of Documents Webpage- **UPDATED**

➤ **NEW** instructions for submittal of TA's and General Permits-

please provide the Central Permit and Processing Unit (CPPU) with the payment and a copy of the **full** application form, then upload the application and all other related documentation for the permit through the SFT site

➤ **NEW** Electronic Transmittal Form – Dated 6/10/2022

- Form now includes PCB program submittals
- Expanded list of documents
- Please DO NOT submit a duplicate paper copy if uploading electronically (unless specifically instructed to, such as for fee payment processing as noted above)





Electronic Transmittal Form for DEEP Remediation, LUST, and PCB Secure File Transfer (SFT)

DEPARTMENT OF ENERGY AND ENVIRONMENTAL PROTECTION
REMEDATION DIVISION, PCB PROGRAM, AND
LEAKING UNDERGROUND STORAGE TANK COORDINATION PROGRAM

www.ct.gov/deep

This Electronic Transmittal Form must be completed and included as the cover sheet of your electronic document when uploading a document to the Connecticut SFT website. Requirements for Transmittals through the SFT website:

**Please note
change in how
to name your
file**

- Documents submitted through the SFT website must include all applicable figures, tables and laboratory data.
- Files must be formatted as PDF/A and use the appropriate naming convention:
 - For Remediation Filings: **REM_REMID #_SiteAddress_Town_DocumentType_DateofDocument**
 - For LUST Filings: **LUST_SiteAddress_Town_AbbreviationForDocumentType_DateofDocument**
 - For PCB Filings: **PCB_SiteAddress_Town_AbbreviationForDocumentType_DateofDocument****Example:** LUST_1MainStreet_Hartford_ESA_01-01-2001
Note: For "AbbreviationForDocumentType" use appropriate abbreviation at [Transmittal of Documents](#)
- **If no Rem ID assigned (new filing) or REM ID is unknown leave field blank**

Part I: Primary Recipient*: REM, PCB or LUST (* required)

For Remediation documents: Primary Program*: Select a Program Rem ID*: <input type="text"/>	For PCB/LUST documents: UST Facility ID: <input type="text"/> (if applicable) Spill Case Number: <input type="text"/> (if known)
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Part II: Site Information

Webpage Updates

- Per- and Polyfluoroalkyl Substances (PFAS) – **NEW** Guidance for municipalities
- Remediation Standard Regulations – 2022 RSR/EUR Training Presentation Slides
- Release-Based Clean Up Program Regulation Development
 - Stakeholder Engagement Advice and Recommendations
 - Release Based Topical Subcommittee Meetings
- Requesting the Commissioner's Approval of Additional Polluting Substances (APS) and/or Alternative Criteria
 - Revised APS Form and Revised EPH/VPH/APH Form



Webpage Updates

- [LEP Verifications](#) – **NEW** Form IIs, Form IIIs revised, and previously revised Verification Forms updated
 - [Verification Form Instructions](#)
- Added form dates on the [EUR/ELUR](#) pages, as requested at the March Roundtable, also updated many of the forms so please make sure you are using the latest form!
- [Remediation Division Contacts](#) updated
- Also pleased to announce we have 9 new LEPs this year so their names and contact information will be added to a new roster coming out in July



Questions or Comments?

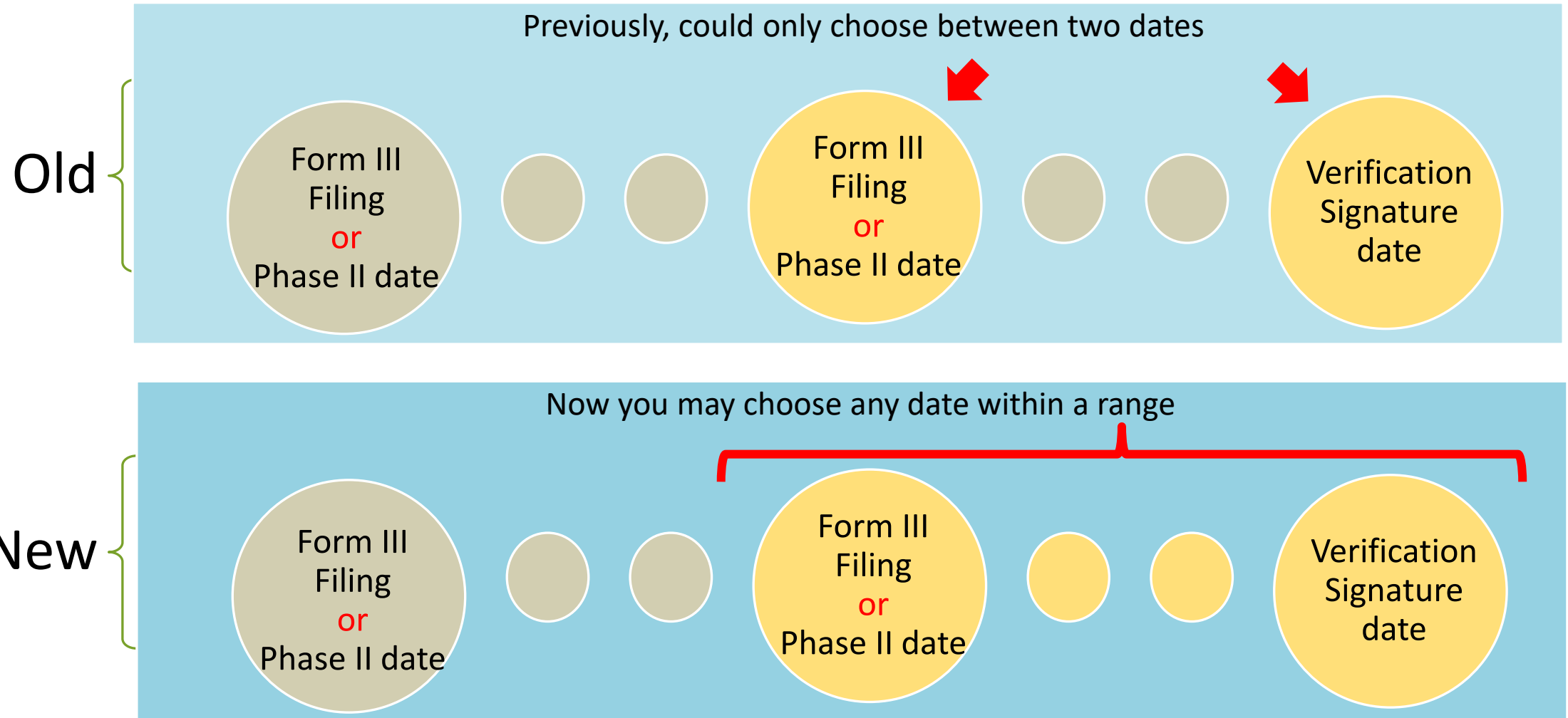
Please type your Questions into CHAT

If we need further clarification, we may take you
off mute to speak

www.ct.gov/deep/remediationroundtable



Changes to Form III Verification applicable date



Questions or Comments?

Please type your Questions into CHAT

If we need further clarification, we may take you
off mute to speak

www.ct.gov/deep/remediationroundtable



Connecticut Brownfields Program Updates



Steele Center Groundbreaking, Berlin March 22, 2021

Mark Lewis and Meena Mortazavi
Remediation Division Roundtable
June 21, 2022



Connecticut Department of Energy and Environmental Protection

Brownfields Liability Relief Programs

- Abandoned Brownfield Cleanup Program (CGS §32-768)
- Brownfield Remediation & Revitalization Program (CGS § 32-769)
- Municipal Brownfield Liability Relief Program (CGS § 22a-ii)
- Please allow at least 60 days for processing of complete application for these programs

American Woolen Mills, Stafford



Eligible Uses of DECD Brownfields Funding

Costs associated with the investigation and redevelopment of a brownfield, including, but not limited to:

- Soil, groundwater and infrastructure investigation
- Assessment
- Remediation
- Lead and asbestos abatement
- Demolition
- Hazardous materials or waste disposal
- Long-term groundwater monitoring & natural attenuation
- Other institutional controls
- Attorneys' fees for environmental consulting
- Planning, engineering and environmental consulting
- Building and structural issues
- Environmental insurance

Targeted Brownfield Development Loan Program

- **Eligible Applicants:** Potential brownfield purchasers and current owners (including municipalities) not responsible for contamination
- **Funding Amounts:** \$500k - \$4 million
- **Applications Competitive:** 2 funding rounds/ year
- Sign up for list server at www.ctbrownfields.gov
- **Terms:**
 - Low-interest -3%
 - Flexible/deferred repayment
 - Up to 30-year term
 - 1.15 Debt Service Coverage ratio
 - No loan forgiveness
 - Loan repayment on permanent refinancing
 - Minimum developer equity of at least 10% of total project cost
 - Equity may include assessment costs, local bonding, cash, administrative expenses, predevelopment expenses, property acquisition costs, deferred developer fee and other investments by applicant

Municipal Grant Program – Assessment and Clean-up

- **Eligible Entities:** Municipalities, Municipal Entities, Connecticut Brownfield Land Banks
 - Encouraging public-private partnerships
- **Applications Competitive:** 2 funding rounds/ year
 - Sign up for list server at www.ctbrownfields.gov
- **Maximum amount:** \$2 million for remediation (\$200,000 for assessment- only)
- **Availability of next funding round expected announcement mid-late July 2022**

Municipal Grant Program – Brownfield Area Revitalization

- **Eligible Entities:** Municipalities, Municipal Entities, Connecticut Brownfield Land Banks, Regional Councils of Government
- **Application Process:** Competitive basis
- **Planning Grant Program:** Focus on area vs. specific site
- **Maximum amount:** \$ 200,000
- **Goals of Program:**
 - Comprehensive understanding of existing conditions and issues
 - Community participation to develop a successful implementation strategy
 - Effective implementation strategies (market studies & feasibility analyses)
 - Prioritization of specific brownfield sites for cleanup and reuse
 - Priorities for public and private investment
 - Formation of an advisory/steering committee
- **Most recent application round closed June 17, 2022**
 - Award announcement expected Aug.- Sept. 2022

Brownfields Funding Updates

- State brownfields funding comes from state bonding
- Round 16: Notice of funding for remediation grants and loans expected July/ August 2022
- Round 17 notice of funding expected February/ March 2023. Type TBD.

Semi- Late Breaking Brownfields News

– Public Act 22-218 Tweaks to Brownfield Program

- ABC Applicants Must Enroll in Voluntary Remediation Program (CGS § 22a-133x) w/in 6 months of *ownership*
- Allows lessees for <5 years to enter ABC & BRRP if they aren't otherwise responsible parties
- ABC & BRRP participants must comply w/ program requirements
- DEEP has time limit for audits in ABC program
- 2- year expiration on ABC & BRRP approvals

– UConn is new EPA Region 1 Technical Assistance to Brownfields Contractor

- <https://tab.program.uconn.edu/>

UConn student brownfield presentation winners with instructors and judges December 10, 2021



Upcoming Brownfields Conferences

National Brownfields Training Conference

Oklahoma City, OK

August 16- 19, 2022

<https://brownfields2022.org/>

Northeast Sustainable Communities Workshop

Stamford, CT

September 13- 14, 2022

<https://nscwonline.com/>



CT EPA Brownfield Grant Recipients 2022

- Renaissance City Development Assoc., Inc., New London
\$615k cleanup grant- 43 Hempstead St.
- St. Luke's Development Corp., New Haven
\$500k cleanup grant- 117- 125 & 129 Whalley Ave.
- Town of Stafford
\$650k cleanup grant- Earl Witt School
- Town of Vernon
\$650k cleanup grant- Daniels Mill
- City of Waterbury
\$150k cleanup grant- Waterbury Button, 835 S. Main St.
- City of West Haven
\$500k Community Wide Assessment grant
- Naugatuck Valley Council of Governments
\$3.9M revolving loan fund



EPA "Big Check" Event, 835 S. Main St., Waterbury
June 2, 2022



Stratford Army Engine Plant, Stratford

- ~75- acre US Army owned facility
- Produced airplanes, engines for airplanes & tanks from 1927- 1997
- Current buildings will be demolished, replaced/ ~ 1.2 million ft² warehouse/ logistics complex in two buildings
- In ABC Program
- Closing expected July 2022



F4U Corsair Production Line, WW II



Site in July 2020



River Mill, Thompson

- Located in North Grosvenordale section of Thompson
- 9.44- acre property w/ former cotton mill built 1872
- Site in Abandoned Brownfield Cleanup Program
- 230 residential apartment units planned



Downtown Rockville Mills, Vernon

- Three mill properties, total ~ 10.4 acres
- Anocoil, Daniels & Amerbelle Mills
- 110 k ft² residential, 20 k ft² commercial w/ brewpub restaurant planned
- Sites in BRRP
- DECD assessment & cleanup grants paved the way



Anocoil Mill



Questions?

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www.ct.gov/deep/brownfields



Release-Based Cleanup Update

June 21, 2022

Brendan Schain

Legal Director, Environmental Quality Branch

Remediation Roundtable



Connecticut Department of Energy and Environmental Protection

What's going on?

- 2nd Phase Subcommittees submitted concept papers at the end of March
- DEEP provided written feedback on May 6th
- Q&A with subcommittee chairs at May 10th working group meeting
- Q&A with DEEP at June 14th working group meeting



What's going on?

- Review and drafting team began meeting to evaluate concept papers on May 18th
 - Provided an update and outline to the working group on June 14th
 - Final report Due June 30th



What's Next?

- Special Working Group meeting June 30th
 - Q&A with review and drafting team
 - Finalize advice and feedback on second phase concepts papers



What's Next?

- DEEP to provide updated work plan at August 9th Working Group meeting
- Additional stakeholder input to be sought on specific topics. Likely topics include:
 - Method 3
 - Other Environmental Professionals
 - Other topics TBD



Questions?

Brendan Schain

Legal Director, Environmental Quality Branch

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<https://portal.ct.gov/DEEP/Remediation--Site-Clean-Up/Comprehensive-Evaluation-and-Transformation/Release-Based-Clean-Up-Program-Regulation-Development>





Road Salt: More Than Just A Grain Of Salt

Veronica "Roni" Tanguay, Environmental Analyst

DEEP Remediation Division

Remediation Roundtable

June 2022



What Is The Problem?

- Introduction to the Environment
 - Road salt overapplication
 - Private property deicing applications
 - Salt storage
 - Ion Exchange Backwash Discharges
 - Fertilizers
 - Food Waste
- Research literature refers to as “Freshwater Salinization”
- Problematic for water supply wells as water corrosivity increases

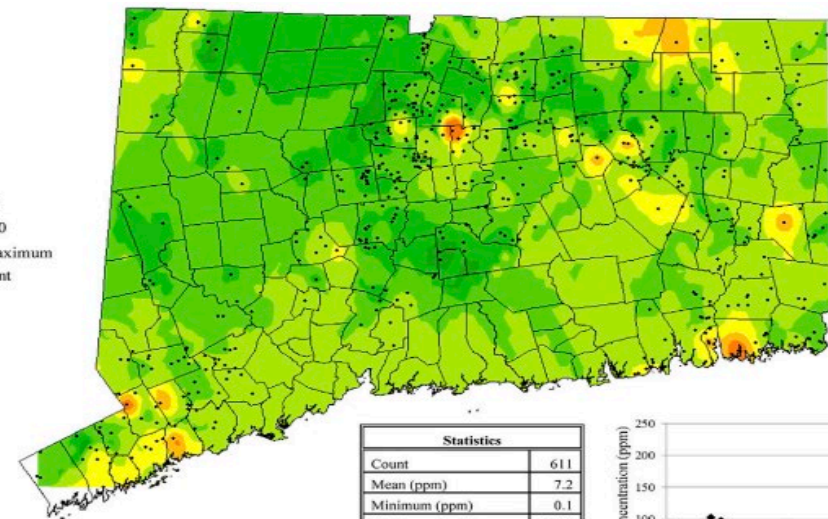
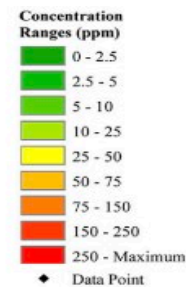
Historic Trends

Cassanelli and Robbins (2013) found a significant increase in average groundwater chloride concentrations over time

- 1894: 1.1 - 6.7 ppm Cl⁻
- Mid-20th century: 0.1 - 220 ppm Cl⁻
- 2002-2007: 1.3 - 1,500 ppm Cl⁻
 - Cl concentrations 68% higher along roadways

Other relevant findings:

- Spatial correlation between chloride increase and proximity to major roads
- Statewide chloride increases parallel to increased road salt use
- ***Average Cl⁻ projected increase by 30% between 2013 and 2030***



Statistics	
Count	611
Mean (ppm)	7.2
Minimum (ppm)	0.1
Maximum (ppm)	220
Standard Deviation	20.1
Mean Error (ppm)	0.004
Trendline Slope	0.27

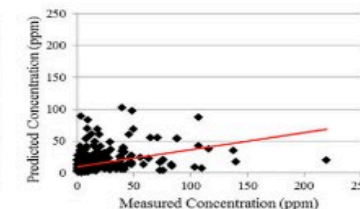
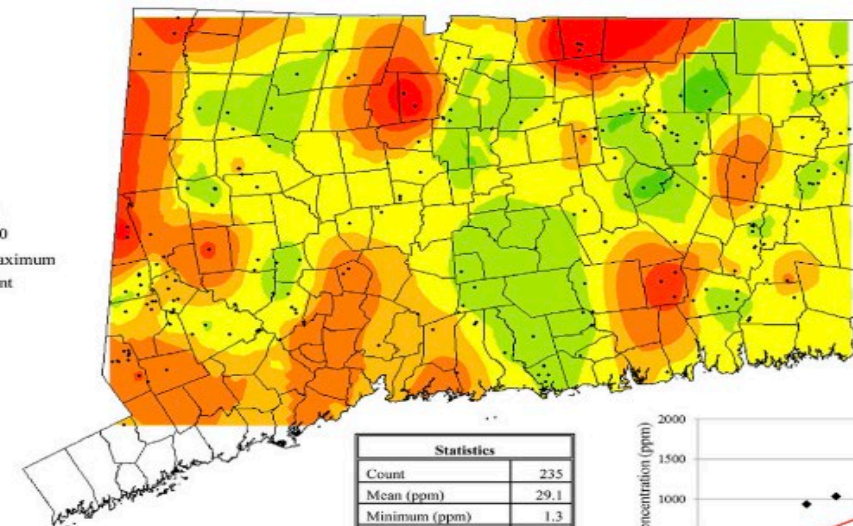
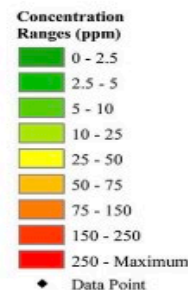


Fig. 4. Chloride concentration map based on Kriging concentrations measured in groundwater samples collected as part of the Connecticut Water Resource Bulletin reports from 1950 to 1969.



Statistics	
Count	235
Mean (ppm)	29.1
Minimum (ppm)	1.3
Maximum (ppm)	1500
Standard Deviation	138.7
Mean Error (ppm)	3.15
Trendline Slope	0.64

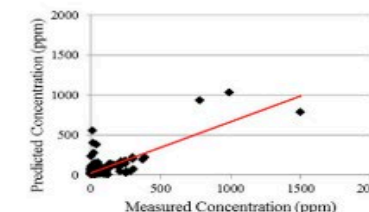


Fig. 7. Chloride concentration map based on Kriging concentrations measured in groundwater samples collected from Connecticut Public Water Supply systems between 2002 and 2007.

Current Known State-wide Salt Impacts

Tracking

Includes cases addressed by:
DOT, Local Health Depts, & DEEP

Current Impacts

204 total known as of June 2022

Latest Complaints

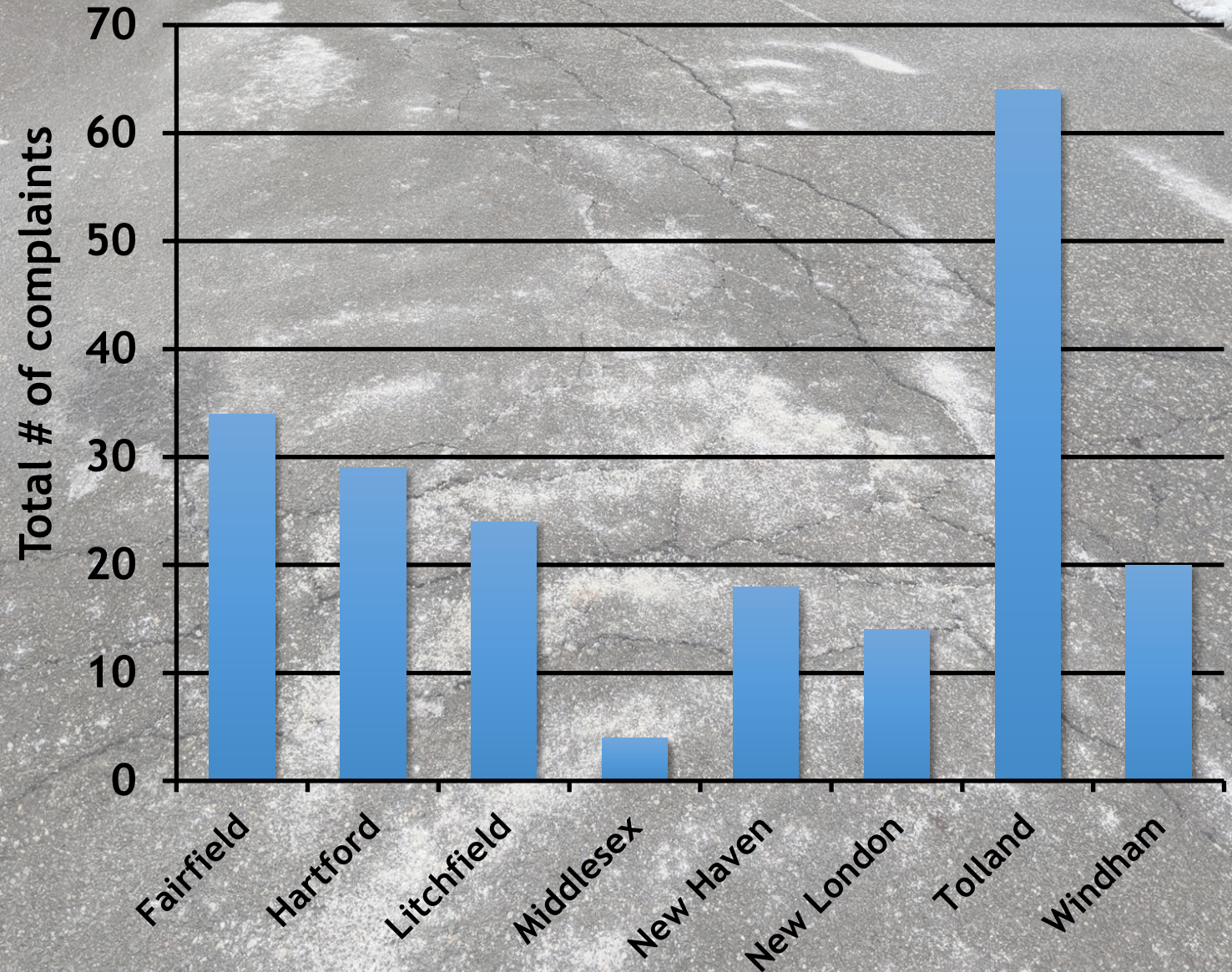
24 new cases received since
January 2021

Criteria

Cl > 250 mg/L – CT DPH MCL

Na > 100 mg/L – CT DPH
Guidance Level

Complaints by County



Who Does This Affect?



Homeowners

Directly impacts property



Salt Applicators

Maintain roads for public safety
Salt application is necessary – no better technology
“Environmentally Friendly” salts



Local Health & Municipalities

Mission is to protect the health and safety of constituents



Consultants

May be retained by Municipalities to investigate salt impacts



Environment

Impairs SW & GW quality
Impacts to flora & fauna

“Eco-Friendly” Salts Or Alternatives Caveats



Beet Juice

- Salt coated in beet juice to make it stick to surface
- Toxic to aquatic biota
- O₂ depletion in aquatic environments



Molasses

- Salt coated in molasses to make it stick to surface
- Attracts wildlife to road increasing incidents of vehicle collisions
- O₂ depletion in aquatic environments



Sand

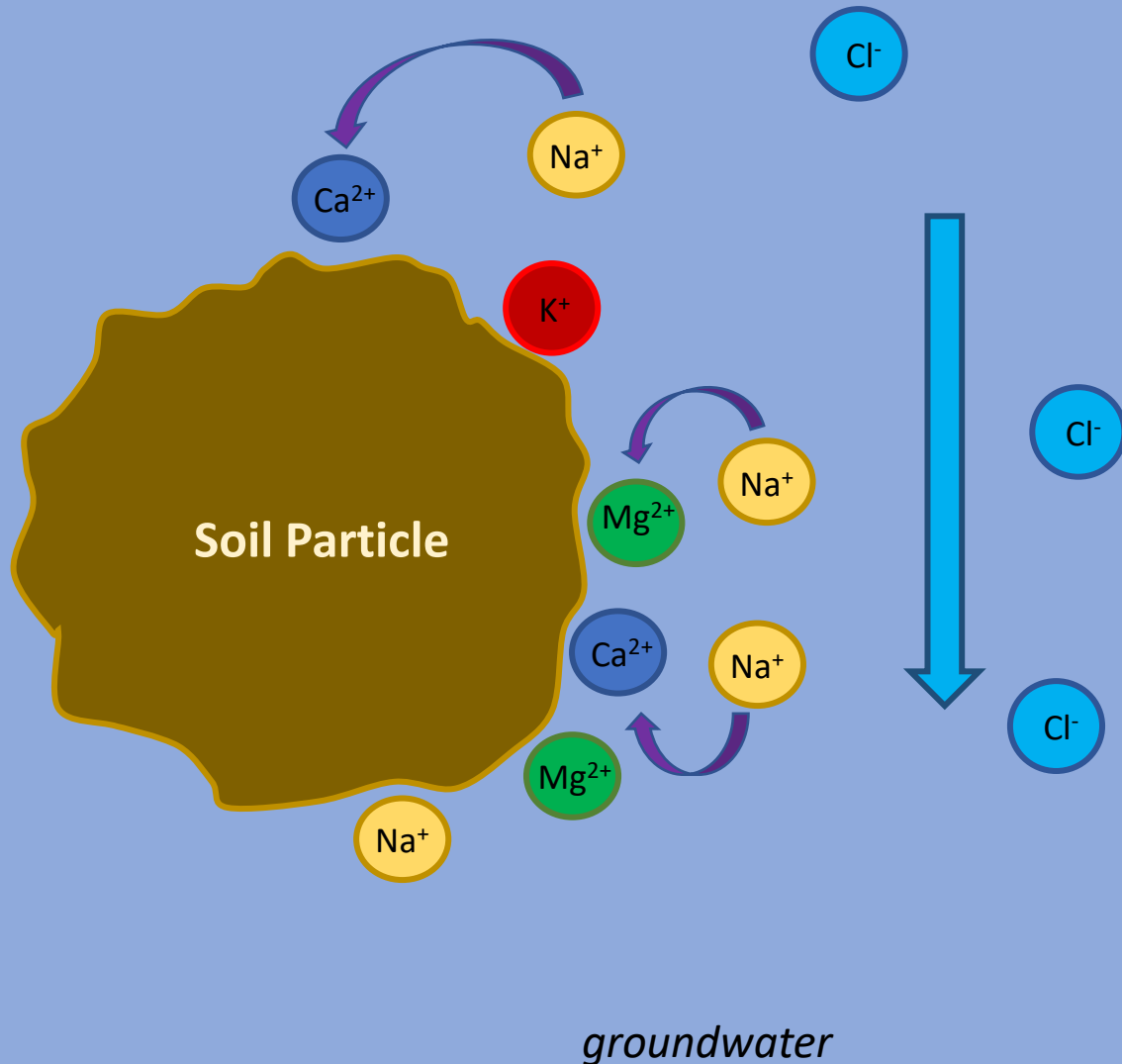
- Clogs waterways & stormwater drainage
- Heavy metals & organic contaminants can bind to particulates
- Health impacts from dust
- Extra expense for Municipalities to sweep roads & clean catch basins



Acetates

- High-cost production
- Significantly more expensive than NaCl
- Can damage concrete
- Requires higher application rates
- Some forms may have higher environmental impact than chlorides

Salt Chemistry 101 – How does salt act differently from other COCs?




- Chloride (Cl^-) is a “conservative” ion
 - Doesn’t like to react so they move through environmental media quickly, i.e. doesn’t “stick” to soil
 - Can persist in the groundwater because of limited reactivity
- Sodium (Na^+) binds to soil reaction sites
 - Kick off other positive ions (i.e., Mg^{2+} , Ca^{2+} , Mn, Fe, etc.) into groundwater, potentially increasing concentrations to problematic levels
 - Can reside in soil for extended periods of time before being flushed into groundwater
- Evaporation concentrates Cl^- in water → more droughts higher Cl^- concentrations
 - Dilution is solution to Cl^- pollution
- Can’t easily filter out of water → Reverse osmosis

Resources For The Public

- [CT DPH NaCl fact sheet](#)
 - Describes sources and impacts from salt




 **Sodium & Chloride in Well Water:
Health Considerations**

Environmental & Occupational Health Assessment Program • September 2018

Introduction

Sodium and chloride are elements that are not highly toxic and comprise the basic components of common table salt. However, they can create concerns when they appear at elevated levels in drinking water. This fact sheet describes the potential sources, health risks and target levels of sodium and chloride in drinking water.



- DEEP Remediation drafting webpage dedicated to salt impacts to private wells

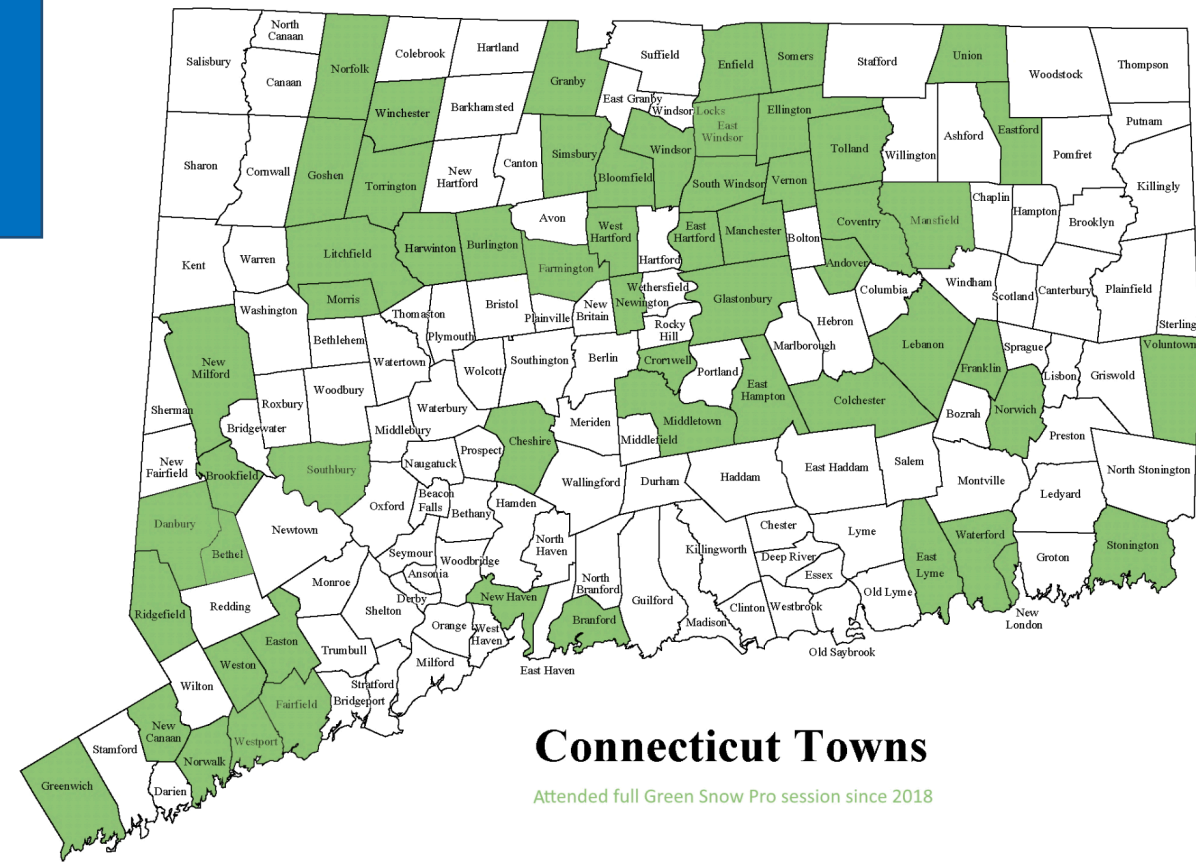


How to Report a Complaint?

- Location of property of impacted well
 - Adjacent to State Road
 - [CT DOT Environmental Compliance Section](#)
 - Adjacent to Town Road
 - Local Health Department
 - **Impacts Cl >250 mg/L & Na >100 mg/L refer to DEEP**
- Questions can be addressed to DEEP.PotableWater@ct.gov

Legislative Updates

- Senate Bill 240: An Act Concerning The Use of Sodium Chloride to Mitigate Snow and Ice Accumulations
 - Passed under House Bill 5506 (State Budget Bill)
- What does this bill do?
 - UCONN's T2 Center provided with funding to support expansion of Green Snow Pro training to include private salt applicators
 - DEEP to create regulations for road salt applications
 - Local Health Departments to create electronic tracking of all salt cases in respective districts
 - Water treatment contractors to test for sodium and chloride prior to recommending treatment options for homeowners



Connecticut Towns

Attended full Green Snow Pro session since 2018

Updated as of 12-1-2021



As of December 2021,
58 Municipalities have
participated in GSP
Training



Questions?

Remediation File Scanning Project

Ray Frigon

Assistant Director Remediation Division

Joanna Burnham

Environmental Analyst Remediation Division



Remediation File Scanning has begun!





Remediation Files Scanning Project

- ❖ Digitization of documents came about from the Commissioners' 20x20 Goals
 - GOAL #14: Enhance Data Transparency
- The estimated document count is 3 million which equates to approximately 10,000 banker boxes
- Projection as of June 2022 is 12 to 18 months until completion
- ❖ What this will mean for you when this project is complete:
 - Digitization will reduce DEEP staff time focused on certain Freedom of Information Requests (FOIA) for documents and eliminates the wait time to get this information for your clients
 - Provides 24/7 access for the public to retrieve the documents
 - Can perform file review right from your own home or office- no more parking and copier fees



Remediation Files Scanning Project

- What this will mean for you and for DEEP Staff while we are in the process:
 - **All** Remediation Division staff will be involved in the project as it continues
 - Staff are tasked with sorting each site and identifying the site for indexing and boxing up the files, followed by QA/QC of the documents once scanned
 - Will be hiring additional seasonal staff to help, also have Staff from our vendor helping with document preparation
 - Yes this will take away from their day-to-day duties on average 1 day per week





The Details.... Rather than scanning each folder as one pdf file the red folders are broken down into 10 categories

Investigation	Permits
Remediation	Verification/ Audit and Enforcement
Engineered Control and Variance Requests	Correspondence
Property Transfer Forms	Monitoring Reports
Significant Environmental Hazard	Miscellaneous

-Files will be indexed with Site Name, Address, Town, REM ID, and associated program

*** Will not be able to capture individual dates of document**

-Each PDF will be word searchable after download



So When???

- Currently boxing up the “B” Towns, Vendor is working on scanning those boxes
- Just finalized details on how to provide a level of QA/QC for the files.
- Once the scanned files are sent through QA/QC and approved they will be sent to the public portal for viewing
- Anticipated date: First files will start to appear on the public portal is August 2022. Starting with the “A” towns
- Coming Soon!** Remediation Scanning Project webpage where you can get up to date progress



Questions or Comments?

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If we need further clarification, we may take you
off mute to speak

www.ct.gov/deep/remediationroundtable



REMEDIATION ROUNDTABLE – 6/21/2022

PFAS Action Plan Update

Speakers: Ray Frigon and Shannon Pociu, CT DEEP Remediation Division



PFAS Agenda

- June 15, 2022, Drinking Water Updates from CT DPH and EPA
 - Cheryl Fields, Toxicologist, and Meg Harvey, Epidemiologist, CT DPH
 - Additional Polluting Substance Criteria
 - Ambient Soil Evaluation
 - Federal Funding for PFAS
- AFFF Take-Back Update & New Guidance for Municipal Fire Departments
- Private Well Projects
- POTW Study
- Hockanum River Fish Consumption Advisory & Follow-up Sampling
- Biosolids



CT's Updated Drinking Water Action Level for Per- and Polyfluoroalkyl Substances

DEEP Remediation Roundtable

June 21, 2022

Cheryl Fields, Toxicologist, CT DPH
Meg Harvey, Epidemiologist, CT DPH

Possible Health Effects of PFAS

The main health concerns for PFAS come from studies in laboratory animals.

The most sensitive effects

- Reproductive and developmental (e.g., low birth weight and growth)
- Reduced immune function (e.g., decreased antibody response to vaccines)

At higher doses

- Changes in liver, kidney, and thyroid
- Disturbs natural hormones and lipids (e.g., cholesterol)
- In humans, PFOA is linked to kidney cancer, as well as testicular cancer at very high exposures

ALs: Statutory Authority, Responsibility & Impact

22a-471

- **DPH Commissioner determines** whether consumption of contaminated groundwater “...can reasonably be expected to create an unacceptable risk of injury to the health and safety of persons...”
- Based on **DPH Commissioner's determination**, DEEP Commissioner is authorized to take actions to address groundwater contamination (can include providing bottled water and/or treatment).

22a-1i

- **DPH conducts & reviews human health risk assessments** of toxic substances in environmental media (e.g., drinking water, soil, air).
- DPH's risk assessments used by DEEP to develop health protective environmental cleanup standards (e.g., soil, surface water, groundwater)

DPH's Action Levels for 4 Individual PFAS

	Critical Health Effect	CT Action Levels (ppt)
PFOA	Developmental Effects	16
PFOS	Immune Suppression	10
PFNA	Developmental Effects	12
PFHxS	Thyroid Effects	49

- Have been detected in nearly all humans and in the groundwater and drinking water in CT
- Are driven by the most sensitive health effect observed for each in animal studies
- Are technically feasible (they are detectable and treatable)
- Are within the range and same magnitude as other federal and state agencies with enforceable standards (MCLs) and recommended guidelines

EPA Health Advisories

On June 15, 2022, the US EPA announced new drinking water lifetime Health Advisories (HAs) for four PFAS.

- EPA HAs are non-enforceable and non-regulatory guidance values
- EPA's HAs for **PFOA** and **PFOS** are *interim* values; the underlying science is being peer-reviewed and the values may change before being finalized
 - These *Interim* values are below levels that can be detected using current lab methods

Final EPA Health Advisories

Gen-X: 10 ppt (PFOA replacement)

PFBS: 2,000 ppt (PFOS replacement)

Interim EPA Health Advisories

PFOA: 0.004 parts-per-trillion (ppt; ng/L)

PFOS: 0.02 parts-per-trillion (ppt; ng/L)

GenX = Hexafluoropropylene Oxide (HFPO) Dimer Acid and its Ammonium Salt

EPA Health Advisories

How do EPA's guidance values compare to guidance and regulatory values from other federal agencies and states?

	EPA	ATSDR	CT	NJ	NY	NH	MI	MN	PA	CA	MA	VT
PFOA	0.004	21	16	14	10	12	8	35	14	10	20*	20*
PFOS	0.02	14	10	13	10	15	16	15	18	40	20*	20*
PFNA		21	12	14		11	6				20*	20*
PFHxS		140	49			18	51	47			20*	20*
PFBS	2,000						420	100		5,000		
GenX	10						370					

* MCLs for VT and MA are based on data for PFOA and PFOS, extended to cover other PFAS, whereas ATSDR & other states used chemical specific data for individual PFAS

EPA *interim* Health Advisories vs. CT Action Levels

	EPA	CT DPH	EPA	CT DPH
	PFOA		PFOS	
DWAL (ppt)	0.004	16	0.02	10
Reference Dose (ng/kg-day)	0.0015	4.5	0.0079	2.9
Critical Effect	Immune (H)	Development (A)	Immune (H)	Immune (A)
Relative Source Contribution	20%	50%	20%	50%

- DPH's [PFAS Frequently Asked Questions](#)

RSR Additional Polluting Substance Criteria

Applies to Σ PFOA, PFOS, PFNA, PFHxS & PFHpA

Remediation Standard	Criterion
Residential Direct Exposure Criterion	1.35 mg/kg
Industrial/Commercial Direct Exposure Criterion	41 mg/kg
GA Pollutant Mobility Criterion	1.4 μ g/kg
GB Pollutant Mobility Criterion	14 μ g/kg
Groundwater Protection Criterion (adopts DPH's Drinking Water Action Level for Σ PFOA, PFOS, PFNA, PFHxS, PFHpA)	70 ng/L
Surface Water Protection Criterion	In Development

- ❖ Existing PFAS APS criteria will be updated to individual criteria for PFOA, PFOS, PFNA, and PFHxS using the new DPH DWALs and Reference Doses.
- ❖ Toxicity information for calculating APS criteria for additional PFAS will be requested from DPH for future inclusion on the APS Fast Track form.

[Requesting APS and Alternative Criteria \(ct.gov\)](https://www.ct.gov)

Other Considerations

- Ambient Soil Evaluation



- Federal Funding for PFAS



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AFFF Take-Back Program Phases

Joint DEEP/DESPP effort supported by \$2M bond

- ✓ Phase 1 – Container Collection & Disposal for state/municipal AFFF concentrate
 - Launched in April 2021; Completed March 2022
 - **35,300 gal.+ collected from >250 fire departments**
 - **Cost of almost \$900,000** for pick up and safe disposal of AFFF in containers
- ✓ Phase 2 – Decontamination study and foam trailer cleaning: **Initiated Summer 2021**
- Phase 3 – Remove AFFF from onboard apparatus: **Pending Summer 2022**



Demonstration Project Approach

- ❑ 2 vendors using 2 different cleaning solutions at separate locations
 - **AECOM** teaming with TRS and Hiller using **PerfluorAd**[®] system
 - **Arcadis** using V171 / Fluoro Fighter[™]

Drain AFFF

Gross Water Rinse

Cleaning Solution
and Water Rinse
(Repeat 3 times)

Sampling After Each Step

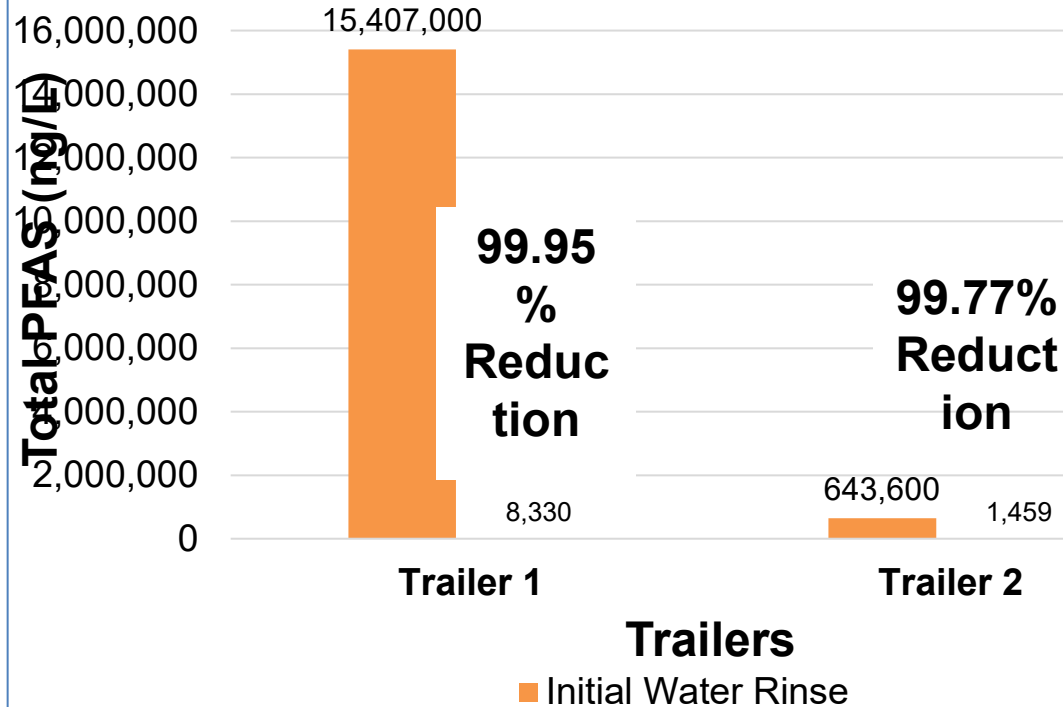
Analysis at Eurofins Lancaster

- PFAS per EPA 537 modified with ID, DoD QSM 5.3 Table B-15, 24 compounds
- TOP Assay on most samples

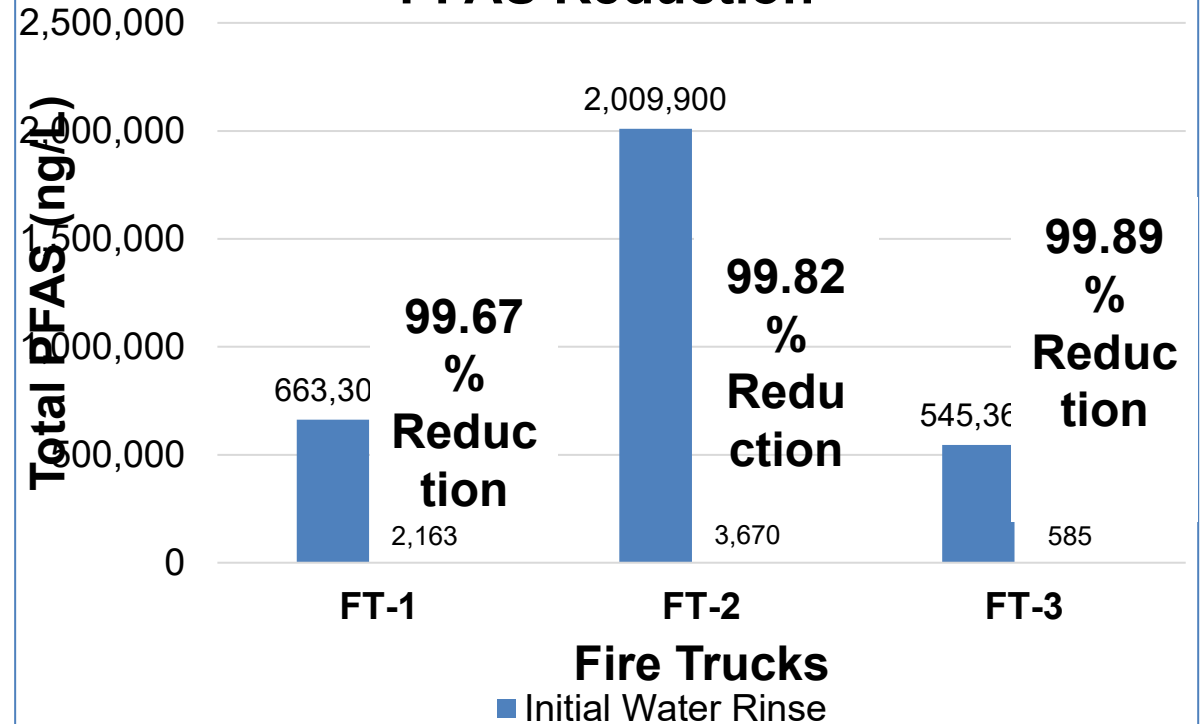


AECOM/TRS/Hiller – Preliminary Results

Foam Trailer Demonstration Cleaning PFAS Reduction

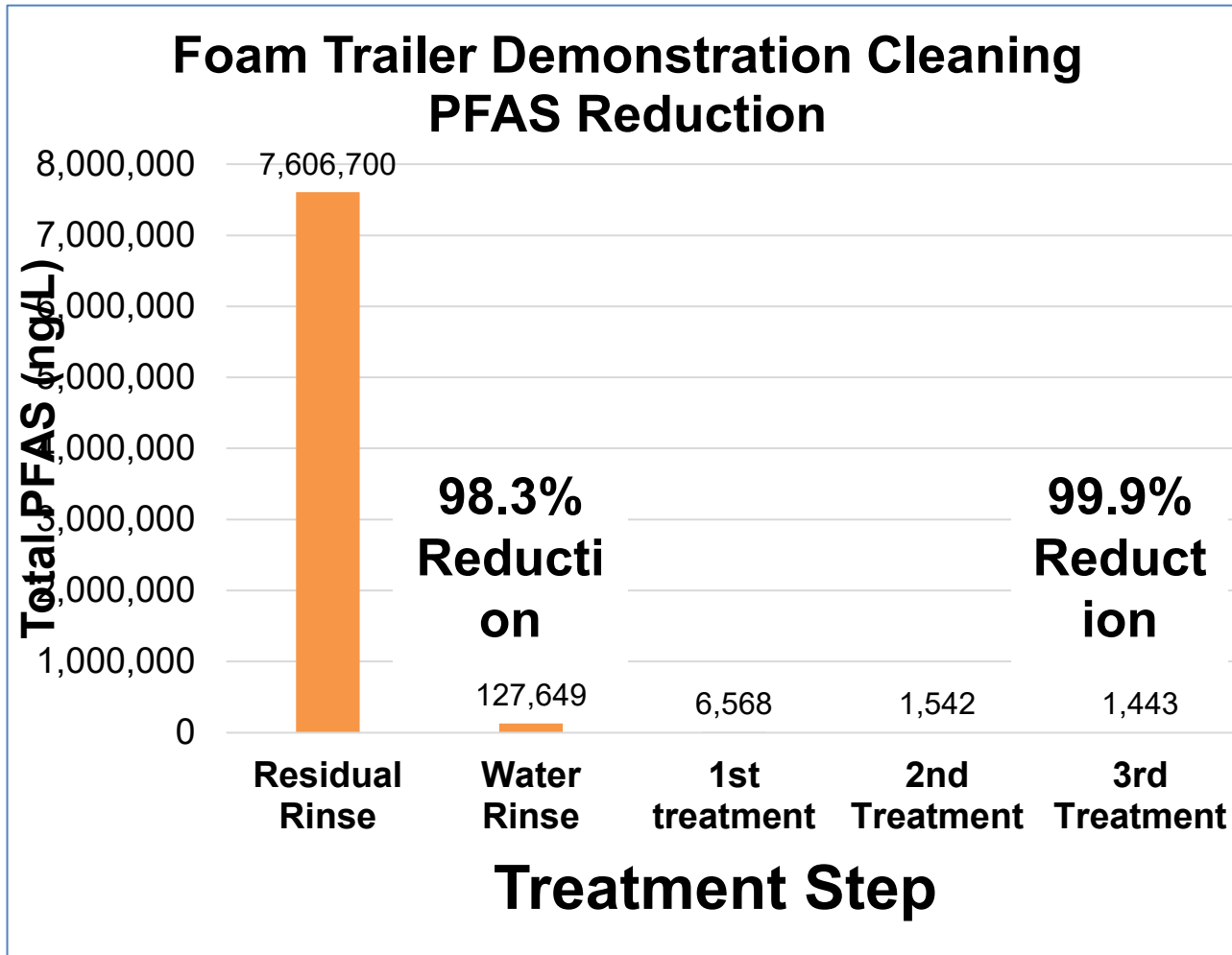


Fire Truck Demonstration Cleaning PFAS Reduction



Notes: 1. Results shown for reduction after 3 treatment applications with **PerfluorAd**[®] system
 2. Total PFAS represents list of 24 PFAS compounds, EPA 537 modified with isotope dilution

Arcadis – Preliminary Results



Notes:

1. Results shown for reduction after 3 treatment applications with Fluoro Fighter™
2. Total PFAS represents list of 24 PFAS using EPA Method 537 modified with isotope dilution

Key Take-Aways from Decon Demonstration

- ❑ **Proprietary cleaning agents were more effective** at reducing PFAS than plain water rinses (>99% vs. ~95% removal)
- ❑ However, **residual PFAS levels remain** following use of proprietary cleaning agents that will still cross-contaminate new Fluorine-Free Foam (F3)
- ❑ Significant Logistics and Cost



Risk Reduction

Transitioning to Fluorine-Free Foam and cleaning fire apparatus is collectively a significant environmental improvement over continued use of AFFF.

- However, residual PFAS remaining in fire apparatus, even after rinsing, can cross-contaminate the new foam. Deployment of the new foam may still pose a potential environmental and/or human health risk.



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May 2022 Guidance: Draining and Rinsing AFFF from Municipal Onboard Systems

Recommendations for Municipal Fire Services

[CFPC Website: Guidance Update](#)

1. If AFFF has not been drained from onboard systems, lock out or remove discharge levers from the pump panel to prevent accidental use.
2. Use new F3 directly from shipping containers with external eductors
3. Drain AFFF remaining in onboard systems for future collection & disposal by DEEP/DESPP.



May 2022 Guidance: Draining and Rinsing AFFF from Municipal Onboard Systems

If a fire department decides to reuse the onboard foam system,

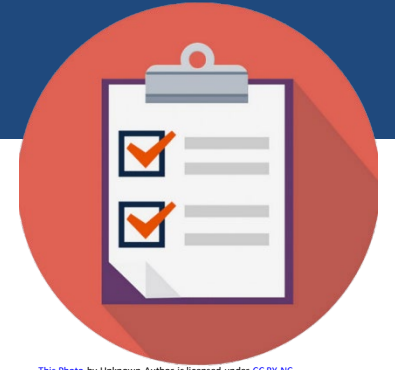
- 1. DEEP & DESPP strongly recommend performing triple-water rinse of the foam system and containing the wastewater.**

****DO NOT DISCHARGE THE WASTEWATER TO THE GROUND OR SEWER****

- 2. The state may collect the PFAS wastewater for disposal (funding dependent).**
- 3. Fire departments can perform additional cleaning at their own expense.**
- 4. The new F3 product will become cross-contaminated with residual PFAS. *Deployment of F3 from onboard systems that previously contained AFFF will require reporting to DEEP Emergency Spill Response.***



Next Steps in Take-Back Program



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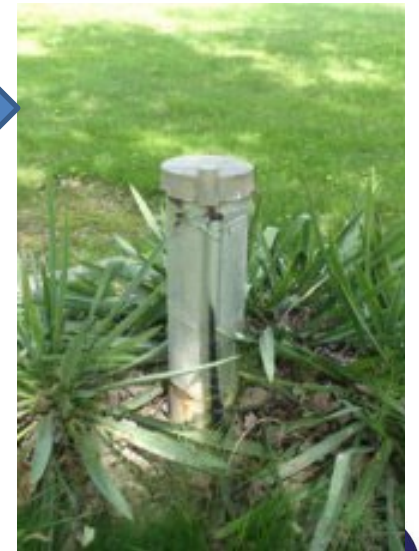
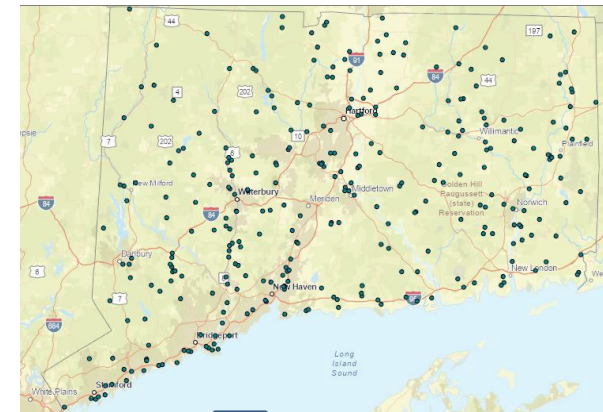
- Phase 2:** Complete cost-benefit analysis for the 5 remaining regional foam trailers (clean vs. replace) and implement selected alternative

- Phase 3:** Collect and dispose of AFFF drained from municipal fire apparatus, as funding allows



ONGOING PFAS PROJECTS – Potable Water Testing

- **Killingworth & East Hampton**
 - DEEP sampling private wells & providing bottled water or GAC treatment where concentrations exceed the action levels
 - Source investigation beginning in Killingworth
- **Testing in additional communities forthcoming in 2022/23**
 - Locations TBD based on PFAS GIS project/ Vulnerability Study, prioritizing areas at high risk of PFAS pollution in EJ communities
 - Will utilize \$1.15M in bond funds received at 12/21/21 Bond Commission Meeting (PA 21-111)



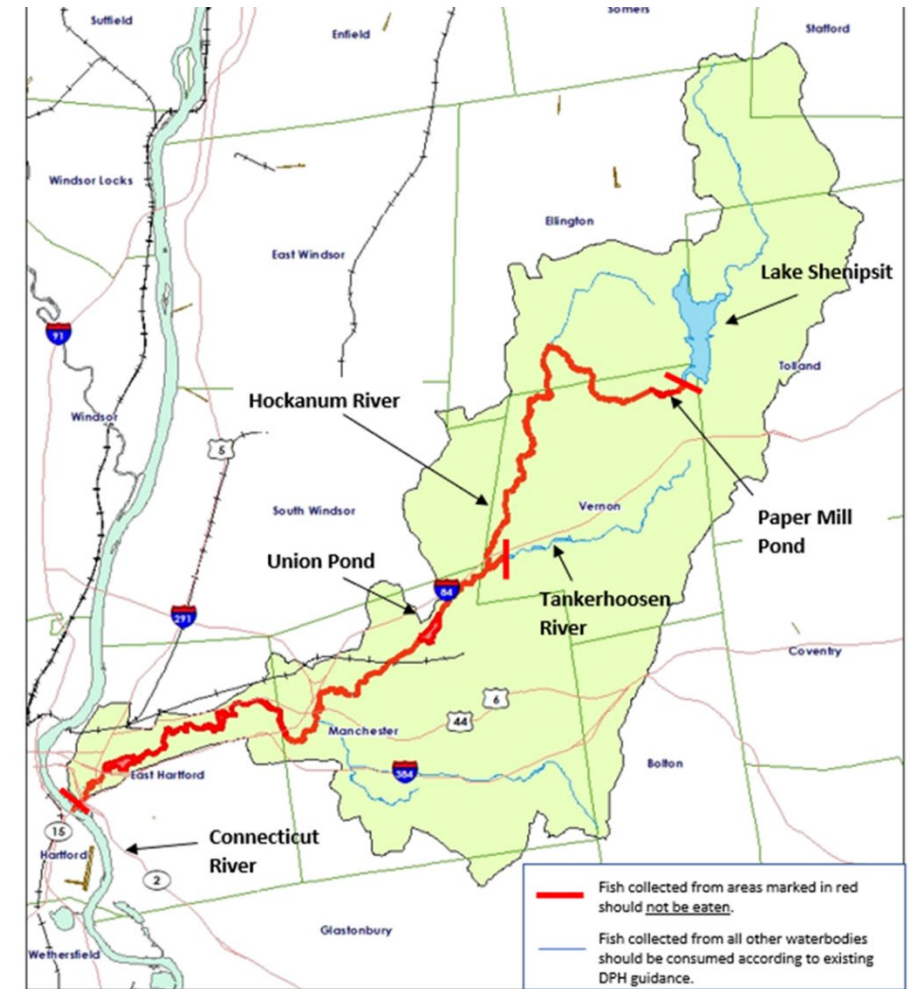
ONGOING PFAS PROJECTS – POTW Testing

- Sampling of about 1/3 of POTWs (35)
 - Summer sampling round completed 9/30/21
 - **Second round completed March 2022**
- Media tested:
 - **Influent, effluent, sludge** at all 35 POTWs
 - **Scrubber water** at 4 POTWs with incinerators
 - **Surface water** and **fish tissue** samples from 10 receiving waters (summer only)
- Final report anticipated in late 2022



SURFACE WATER/FISH – Hockanum River

- Elevated PFOS concentrations in fish tissue identified during POTW sampling project in vicinity of Vernon WWTP
- Surface water not especially high
- 4/8/22 – DPH issued “Do Not Eat” fish consumption advisory for Hockanum River downstream of Lake Shenipsit
- DEEP performing follow-up surface water, sediment, and fish tissue sampling to refine stream reaches of concern and identify source area(s)



Fish Tissue Consumption Advisory Map:
Hockanum River Watershed

0 1 2

4 Miles



BIOSOLIDS

- **Department of Agriculture & CT Agricultural Experiment Station**
 - Evaluating PFAS content of some commercially available biosolids-based fertilizers manufactured and sold in CT
- **Joint DEEP/DoAg [PFAS Information for Agriculture](#), May 2022**
 - Recommends avoiding bulk land application of biosolids-based fertilizers containing PFAS greater than 1.4 ug/kg (ppb) for the Sum of 5 PFAS (PFOA, PFOS, PFNA, PFHxS, PFHpA).

PFAS in Biosolids Information for CT Agriculture

The Departments of Agriculture (DOAG) and Energy and Environmental Protection (DEEP) want to spread awareness about a family of chemicals called per- and polyfluoroalkyl substances, or PFAS, that can be found in fertilizers derived from biosolids. DOAG and DEEP recommend that **farmers do NOT apply processed biosolid fertilizer to agricultural fields without first requesting PFAS test results** from their suppliers. If the biosolid product contains a combined PFAS concentration of 1.4 micrograms per kilogram [$\mu\text{g}/\text{kg}$, or parts per billion (ppb)] or more for five specific PFAS chemicals*, it is recommended that you do not apply that product in bulk to your fields.

Research has shown that plants growing in soil that is repeatedly amended with PFAS-contaminated biosolids can impact all parts of the plant – roots, shoots, and fruits. Consumption of crops containing PFAS has the potential to cause adverse health effects in people and livestock. Further, PFAS-contaminated biosolids can also pollute groundwater below the application site, causing a risk to the people and livestock that drink local groundwater. Note that in other states, PFAS has been found in milk from dairy cows that consumed PFAS-containing crops and drinking water.



NEXT STEPS FOR DEEP

- ✓ **UPDATE APS CRITERIA, ESTABLISH AMBIENT WATER QUALITY & SURFACE WATER PROTECTION CRITERIA**
- ✓ **COMPLETE STATE & MUNICIPAL AFFF TAKE-BACK PROGRAM**

- ✓ **FOCUSED PRIVATE WELL SAMPLING IN HIGH-RISK AREAS**
- ✓ **LANDFILL MONITORING**
- ✓ **SUPPLEMENTAL BID FOR PFAS LAB ANALYSIS**
 - To include additional matrices and methods

QUESTIONS?

[DEEP PFAS Webpage](#)
[PFAS Task Force Webpage](#)
[CT PFAS Action Plan](#)

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Remediation Roundtable



E-mail: DEEP.remediationroundtable@ct.gov

Web: www.ct.gov/deep/remediationroundtable



An abstract background composed of various brushstrokes in shades of blue, green, and brown. The colors are layered and blended, creating a textured, painterly effect. The blue is most prominent at the top, transitioning into greens in the middle, and darker browns and oranges at the bottom.

Remediation Roundtable
Next meeting October 18, 2022