TRILEAF

environmental architecture engineering

TRILEAF

- Environmental Consultation
  - National coverage
  - Commercial real estate
  - Telecommunications
- Cultural Resources
  - Archaeological & Architectural history surveys
  - Tribal communications
- Architecture & Engineering

- 30 Years
- 20+ Locations E à W Coast
- 250+ Employees

Meet The Team

Clint Carlson
Account Manager
Eastern Region
Environmental Professional
Schaumburg, IL Office
9 Years at TRILEAF

Sammy Hoskins
Group Manager Commercial Division
Quality Control Manager
Environmental Professional
St. Louis, MO Office
10 Years at TRILEAF

Why lenders should care about environmental due diligence?

- Market value of the property can be greatly diminished
- Cost of remediation could cause borrower to default on the loan … now it's the bank's responsibility!
- Lender can be held liable for the clean up costs.
- If the government cleans up the site, it can file a lien to recover the costs.

How Can We Help?

- RiskCheck Basic
- RiskCheck Plus
- Transaction Screen Assessment (TSA)
- Phase I Environmental Site Assessment (ESA)
- Phase II ESA
- Property Condition Assessment (PCA)
- Mold / Asbestos / Lead Assessment

RiskCheck Basic:

- Regulatory Records Review up to 1 mile of Property;
- 2-3 Business Days

RiskCheck Plus:

- Regulatory Records Review up to 1 mile of Property;
- Historical topographic maps, aerial photographs, city directories, fire insurance maps (when available) up to 1 mile of Property;
- SBA Compliant
- 2-3 Business days

TSA – Transaction Screen Assessment

- Regulatory records review up to 1 mile of the Property;
- Historical topographic maps, aerial photographs, city directories, fire insurance maps (when available) up to 1 mile of Property;
- On-site property inspection
- Owner interview
- SBA compliant, not ASTM compliant
  - Does not meet AAI requirement for CERCLA Liability Protection
- 10 business days

Phase I ESA

- Regulatory records review, historical topographic maps, aerial photographs, city directories, fire insurance maps (when available) up to 1 mile of Property
- On-site reconnaissance walk through
- Owner interview, site manager interview, occupant interview, local government inquiries, Freedom of Information Act (FOIA) requests
- Within 15 Business Days
  - Can Expedite for additional fee

Phase II ESA

- Groundwater and ground soil sampling based on Recognized Environmental Conditions (RECs) identified in Phase I ESA
- Timeline dependent on laboratory and drill rig availability
  - Standard turnaround time in the range of 20 business days for full scale Phase IIs

PCA – Property Condition Assessment

- Analysis of major building components to anticipate any large repairs or renovations that may have to occur within the first few years of operation
- Within 15 Business Days

Mold, Asbestos, Lead Assessments

- Lead Risk Assessments for childcare facilities per SBA SOP

Important Details to Remember

- A Phase I ESA has a shelf-life of 365 days, BUT that requires a Phase I ESA Update report be completed at the 180 day or 6-month mark.
- Not sure what report may be best for you? Reach out and we can help guide you to the correct report type.
- Trileaf is always here to discuss any past, present, or future reports you may need assistance with.
  - We are always happy to talk with your borrower, or immediate client. However, we will request written permission and your presence for any discussions.

PFAS

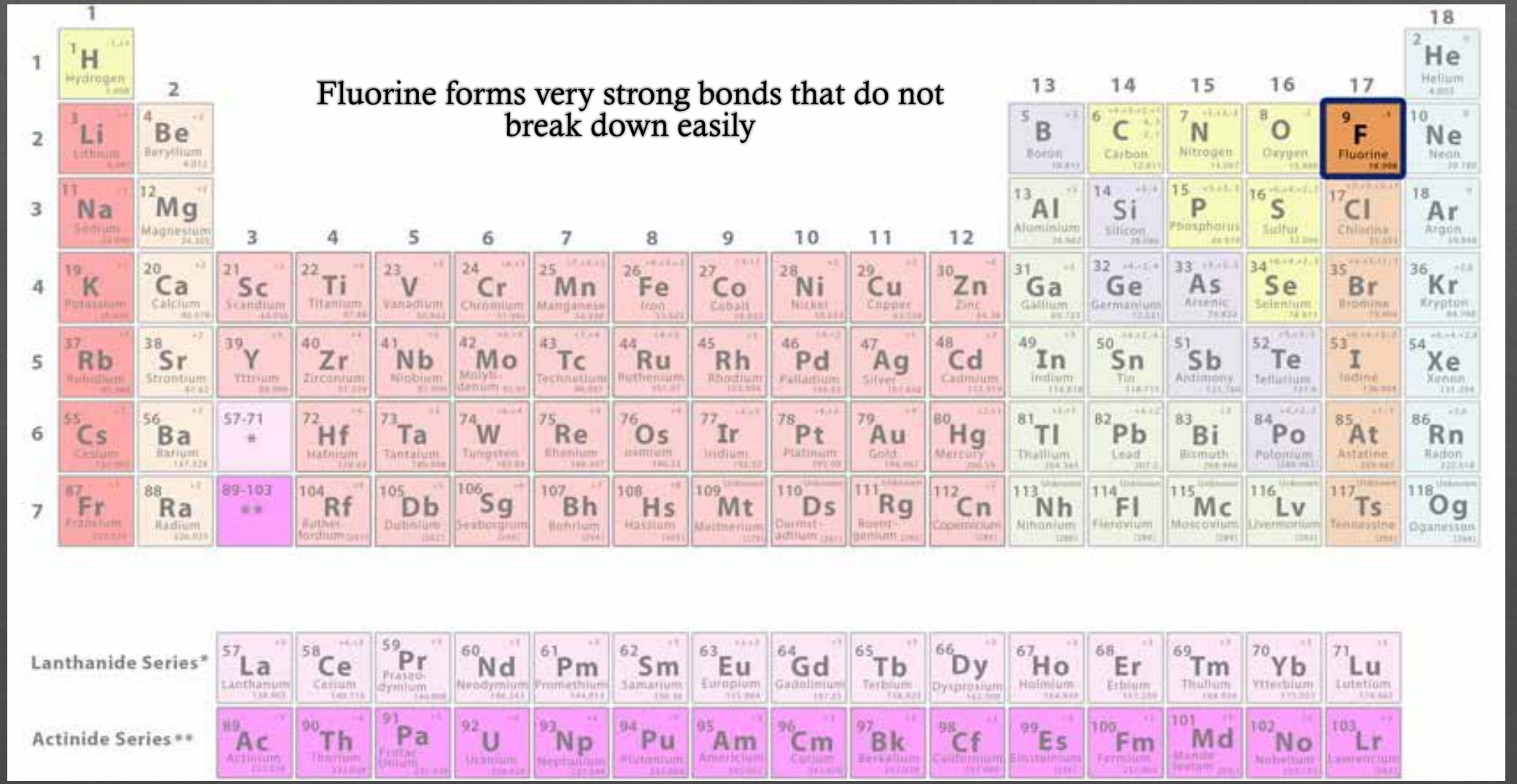
Sammy Hoskins

PFAS: What is it?

- PFAS: “Per- and polyfluoroalkyl substances”
- Delayed implementation for ASTM E1527-21 (Feb 2023)

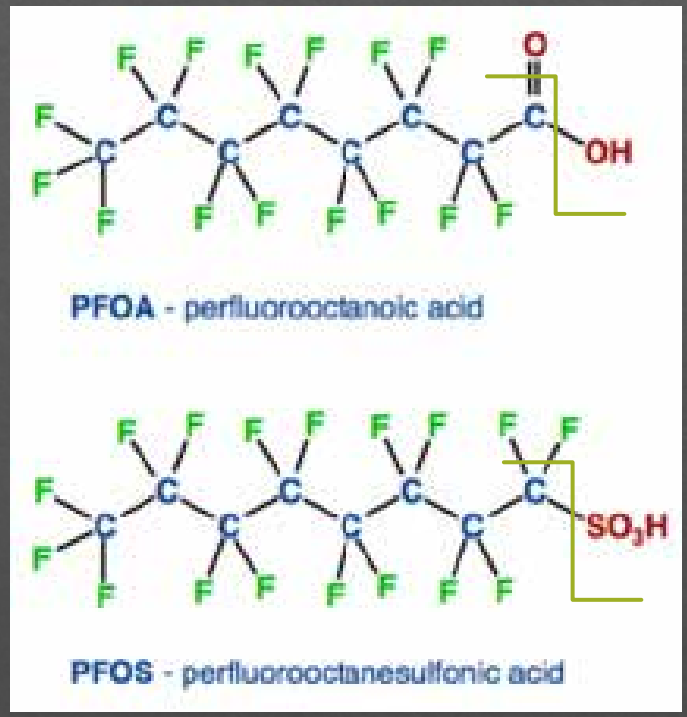
- Definitions vary
  - U.S. EPA : 14,735
  - Organization Economic Cooperation and Development (OECD): 4,730
  - PubChem molecule database matching OECD definition: 6M+
- Currently regulated as hazardous substances in United States: 0
- Persistent organic pollutants (“Forever chemicals”)

Why "Forever Chemicals"?



PFOA & PFOS

- PerFluoroOctanoic Acid (PFOA)
  - Perfluoro-
    - Maximum fluorine
  - -Octanoic acid
    - 8 carbons
    - Carboxylic acid (-COOH)
- PerFluoroOctane Sulfonic acid (PFOS)
  - Perfluoro-
    - Maximum fluorine
  - -Octane
    - 8 carbons
  - Sulfonate
    - $S(=O)_2–O^-$

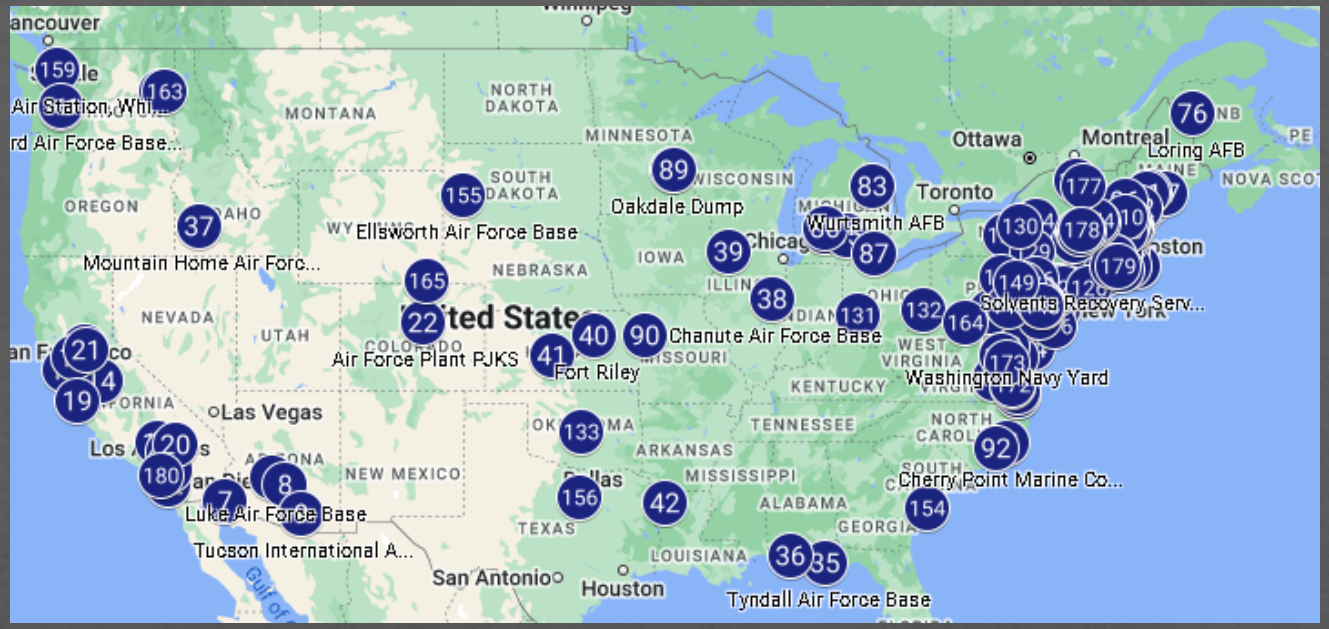


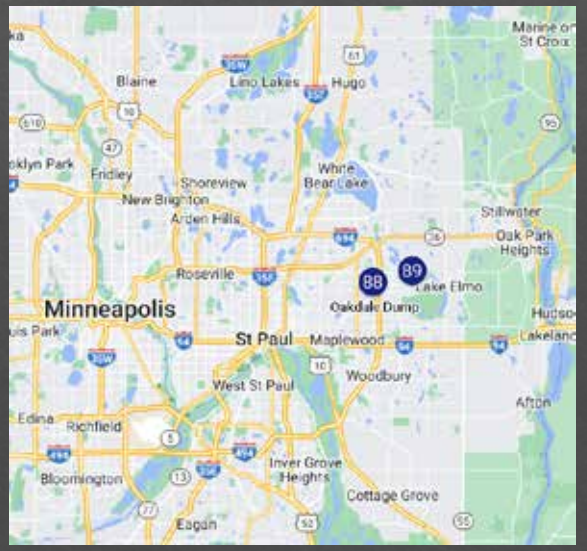
PFAS Applications

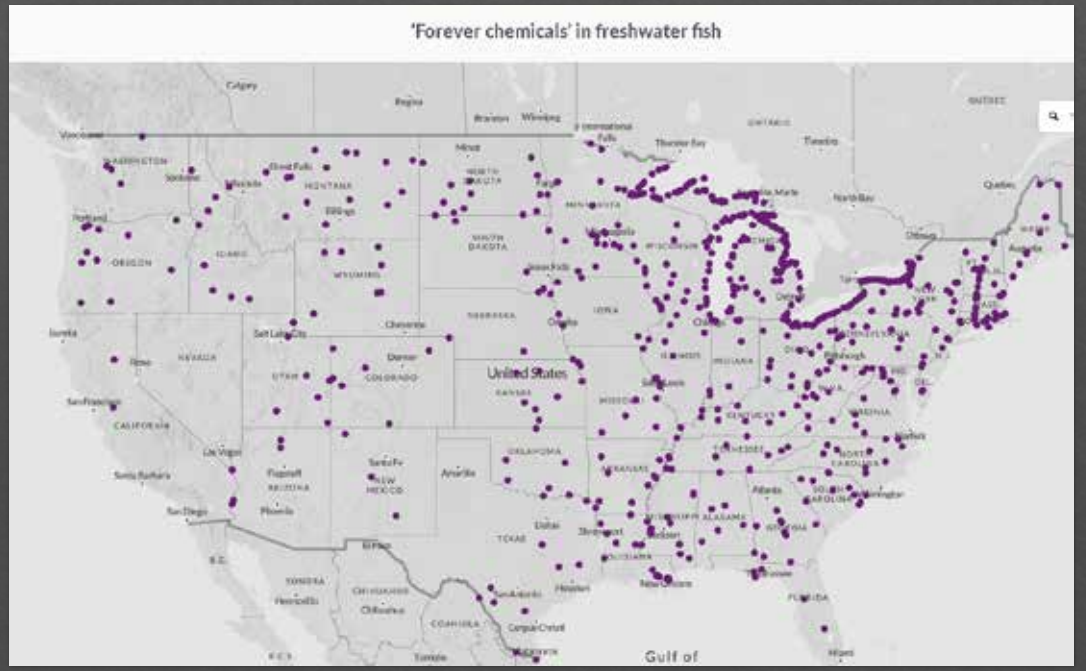
- Firefighting foam
  - Aqueous Film Forming Foam (AFFF)
- 72% of products labelled as waterproof, water repellant, water or stain resistant
- Stain-resistant carpeting
- Non-stick cookware
- Cosmetics
- Sunscreen
- Cell phones (screen)
- Various household products
  - Floss, shampoo, toilet paper (sewer)

PFAS: Where is it?

- 180 Superfund sites
  - (13% of 1,336 total)
- Oakdale Dump
- Washington County Landfill in Lake Elmo
- Bioaccumulates in fish and humans







PFAS: Why are they bad?

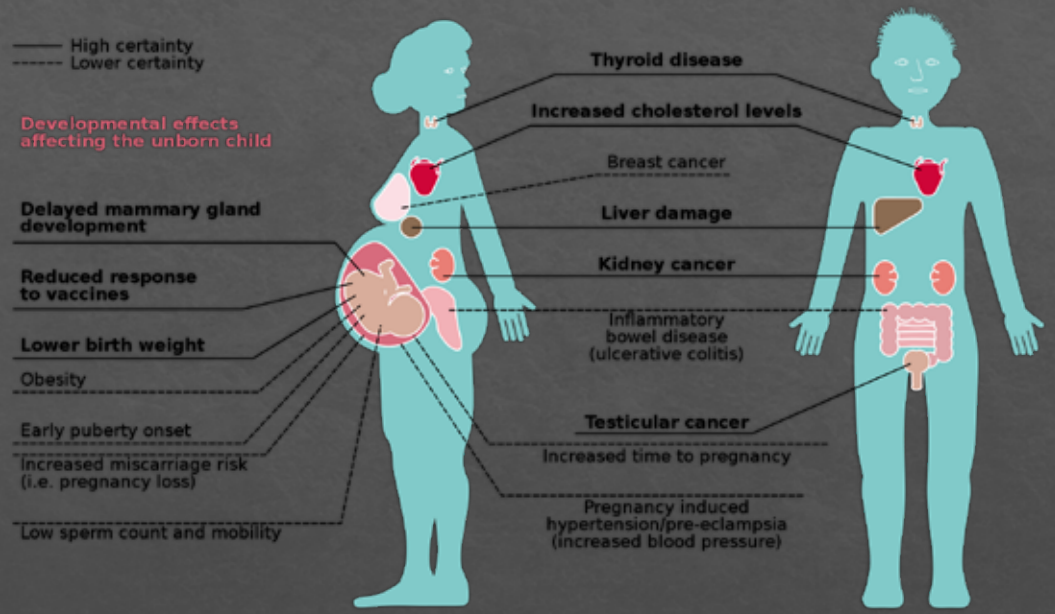
Detected in bloodstream of US population (per CDC):

PFOS 99.9%

PFOA: 99.7%

PFNA: 98.8%

PFHxS: 98.3%



Including infants:

- Crosses placental barrier
- Found in human breastmilk

PFAS: History of Use & Regulation

(Do not occur naturally)

- 1938: Polytetrafluoroethylene (PTFE) accidentally invented
- 1941: Patented
- 1945: Teflon trademarked, used in Manhattan project to help seal pipes at uranium enrichment plant in Oak Ridge TN
- 1950: 3M study reveals PFAS bioaccumulates in blood of mice
- 1954: First Teflon pans produced in Europe
- 1956: Stanford University finds PFAS binds to proteins in human blood
- 1961: First Teflon pans sold in US as "Happy Pan"
- 1961: DuPont begins privately researching medical effects of PFAS, notes it is "very toxic", recommend "handle with extreme care"
- 1966: Navy patents aqueous film-forming foam (AFFF)
  - 1967: Jet fuel fire on USS Forrestal kills 134
- 1966: FDA rejects DuPont petition to use PFAS in food packaging, citing liver studies
- 1967: FDA approves aforementioned use, go on to approve dozens more in coming decades
- 1974: Air Force recommends treatment of AFFF waste, citing toxicity
- 1975: DuPont memo to 3M warns about toxic effects of PFAS in food packaging
- 1976: Navy notes toxic effects of AFFF on fish, suggests finding alternative
- 1978: 3M concludes PFOS and PFOA "should be regarded as toxic"

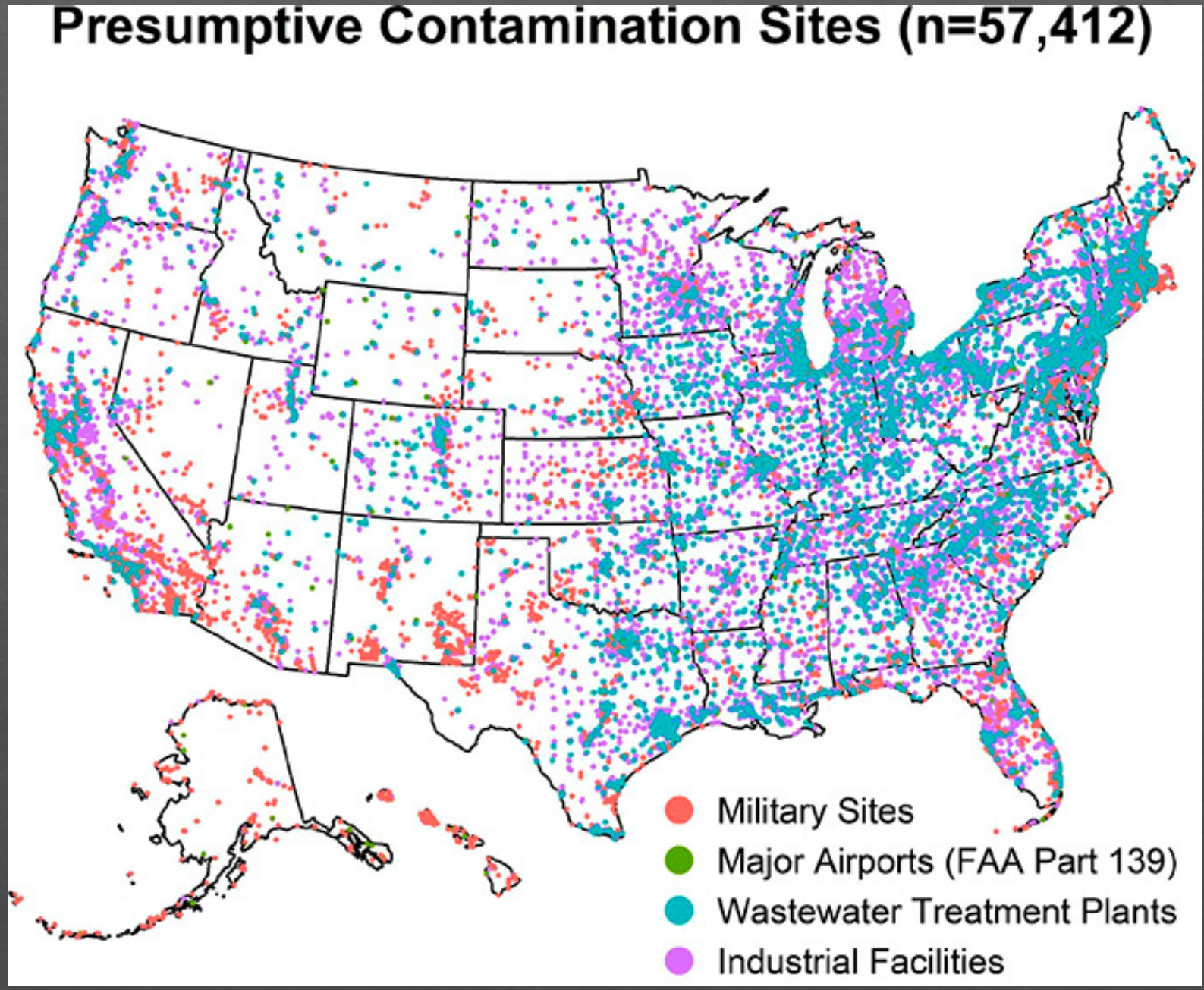
PFAS: History of Use & Regulation (cont'd)

- 1981: 3M and DuPont reassign female workers after PFAS damages eyes of fetus
- 1984: DuPont detects PFAS in tap water of towns near Ohio factory
- 1984: 3M documents rising levels of fluorine in blood of workers
- 1998: 3M alerts EPA that PFAS bioaccumulates in human blood, including non-occupational exposure
- 1998: 3M sent EPA rat studies showing liver damage from PFAS
- 1999: 3M scientist resigns in frustration at lack of company action over PFOS, calling it "most insidious pollutant since PCB"
- 1999: EPA begins audit of 3M studies
- 2000: 3M ceases PFAS production in US
- 2001: DOD memo finds PFOS "persistent, bioaccumulating, toxic"
- 2001: 3M submits 1982 toxicity study to EPA
- 2002: 3M ceases PFAS production globally
- 2005: DuPont fined $10M for failing to report "substantial risk of injury to human health" from PFOA
- 2006: 3M fined more than $1.5M after they disclose 244 violations of Toxic Substances Control Act, including PFOS & PFOA
- 2006: EPA "does not believe that consumers need to stop using" PFAS-containing products
- 2006: EPA Science Advisory Board finds PFOA likely human carcinogen
- 2010: FDA raises concern about safety of previously-approved PFAS used in food packaging
- 2016: PFAS sets "health advisory" non-enforceable level of 70 ppt
- 2018: State of Minnesota and 3M agree $850M settlement
- 2020: NDAA prohibits DOD from use of AFFF during training, requires phaseout by 2024
- 2022: PFAS revises health advisory limits to 0.02 ppt PFOS, 0.004 ppt PFOA
  - (Equivalent to 1 drop of water in 1,000 & 5,000 Olympic swimming pools)
- 2023: Dupont (and spinoffs Chemours and Corteva) agree $1.2B settlement brought by public water companies

Presumptive Contamination (57,412 sites)

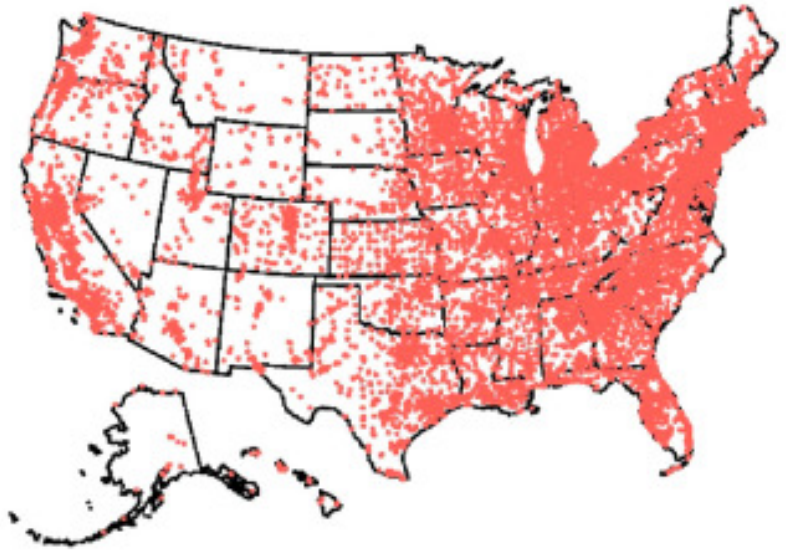
Environ. Sci. Technol. Lett. 2022, 9, 11, 983−990

1. AFFF discharge sites
   - Military sites (3,493)
   - Major airports (519)
   - Firefighting training
   - Other hazardous flammable liquids with historical fires
     - Oil and gas extraction sites
     - Bulk oil storage
     - Petroleum refineries
     - Railroad crashes
     - Chemical mfg facilities
2. Industrial facilities that use or produce PFAS, or are likely to based upon NAICS codes (49,145)
3. Wastewater treatment plants (4,255)
4. Facilities with PFAS-containing wastewater or solid waste


Presumptive Contamination Sites (n=57,412)
Military Sites
Major Airports (FAA Part 139)
Wastewater Treatment Plants
Industrial Facilities

Presumptive Contamination Sites (n=57,412)

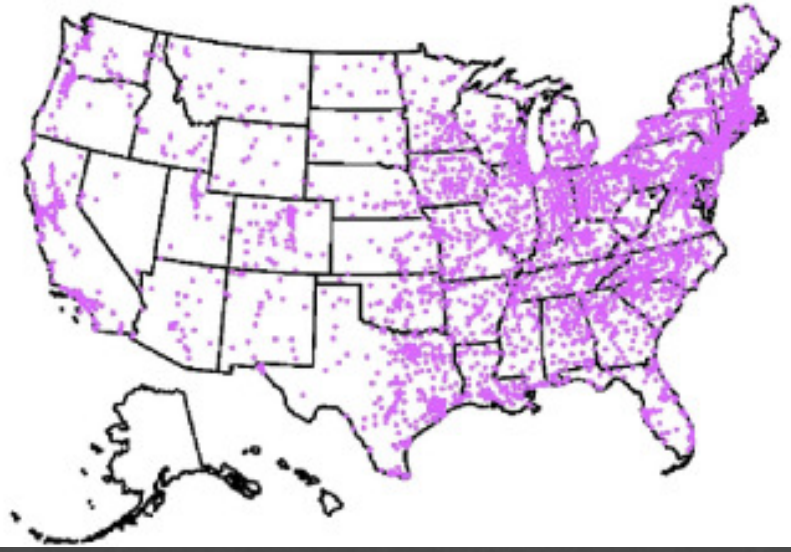
Industrial Facilities (n=49,145)



Major Airports (n=519)

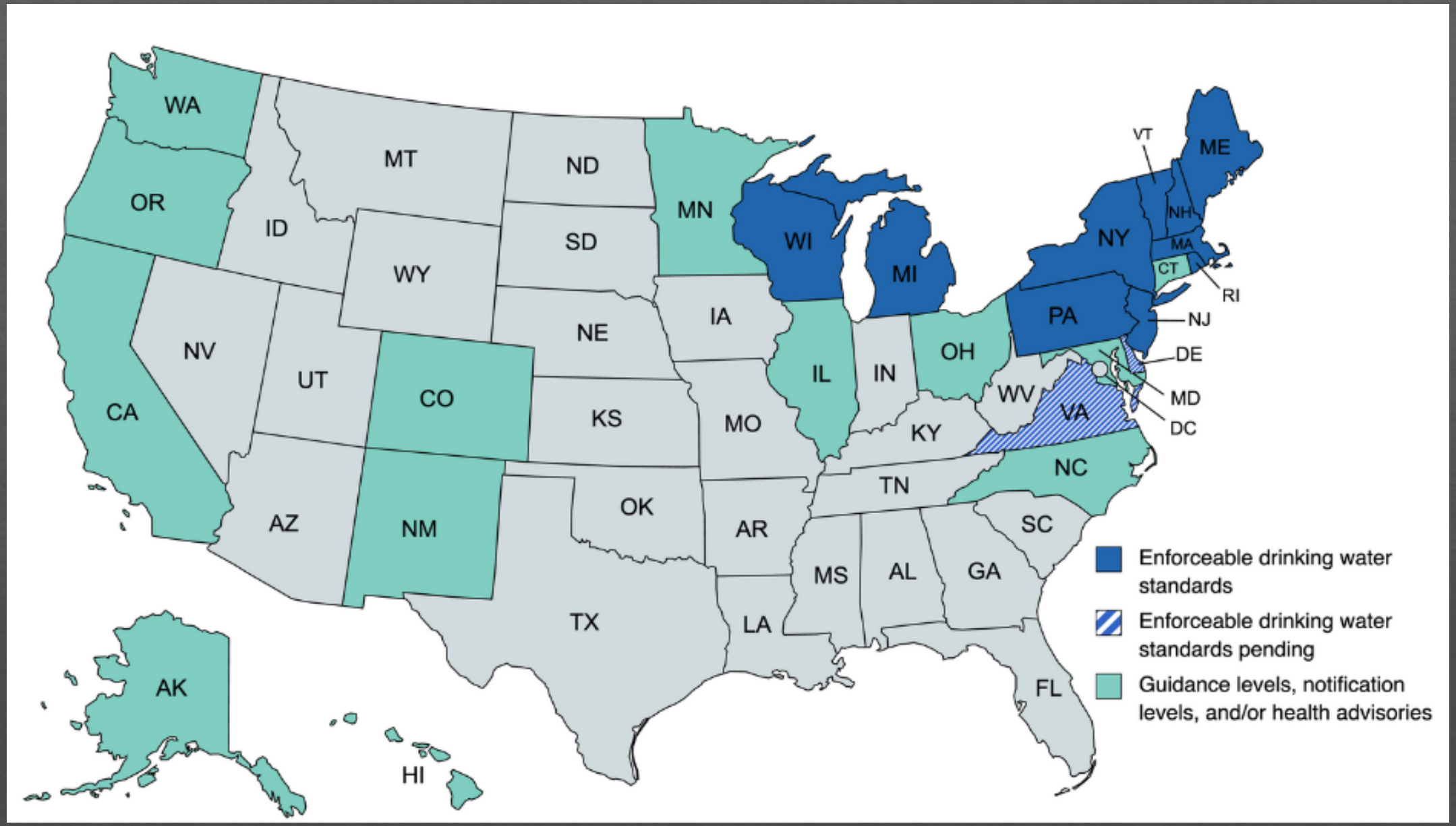
Military Sites (n=3,493)

Wastewater Treatment Plants (n=4,255)



NAICS code	List of potentially affected U.S. industrial entities
488119	Aviation operations.
314110	Carpet manufacturers.
811192	Car washes.
325	Chemical manufacturing.
332813	Chrome electroplating, anodizing, and etching services.
325510	Coatings, paints, and varnish manufacturers.
325998	Firefighting foam manufacturers.
562212	Landfills.
339112	Medical Devices.
922160	Municipal fire departments and firefighting training centers, including Federal agencies that use, trained with, and tested firefighting foams.

NAICS code	List of potentially affected U.S. industrial entities
322121 and 322130	Paper mills.
325320	Pesticides and Insecticides.
324	Petroleum and coal product manufacturing.
324110 and 424710	Petroleum refineries and terminals.
352992	Photographic film manufacturers.
325612	Polish, wax, and cleaning product manufacturers.
325211	Polymer manufacturers.
323111 and 325910	Printing facilities where inks are used in photolithography.
313210, 313220, 313230, 313240, and 313320	Textile mills (textiles and upholstery).
562	Waste management and remediation services.
221320	Wastewater treatment plants.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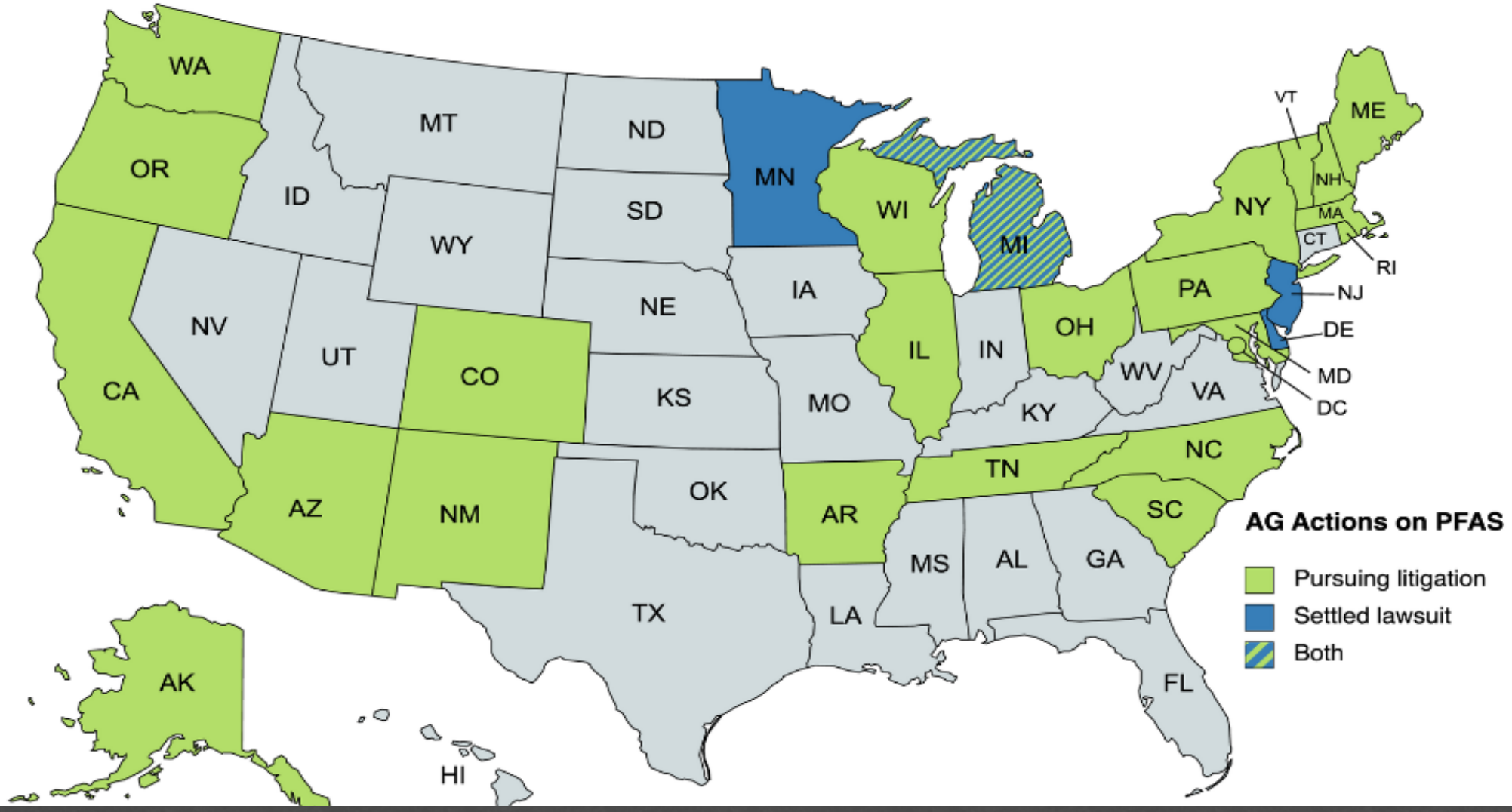
DC
AK
HI
Enforceable drinking water standards
Enforceable drinking water standards pending
Guidance levels, notification levels, and/or health advisories

State Attorney General PFAS Lawsuits



Resources

- Slide 13:
  - EPA https://comptox.epa.gov/dashboard/chemical-lists/PFASSTRUCT
  - OECD https://one.oecd.org/document/ENV/CBC/MONO(2021)25/En/pdf
  - Pubchem https://pubchem.ncbi.nlm.nih.gov/classification/#hid=120
- Slide 16:
  - 72% figure: https://toxicfreefuture.org/wp-content/uploads/2022/08/toxic-convenience.pdf
- Slide 17:
  - 180 Superfund sites: https://www.epw.senate.gov/public/index.cfm/superfund-sites-identified-by-epa-to-have-pfas-contamination
  - Fish map: https://www.ewg.org/interactive-maps/pfas_in_US_fish/map/
- Slide 18:
  - https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2072821/
  - Image (with citations) https://en.wikipedia.org/wiki/Per-_and_polyfluoroalkyl_substances#/media/File:Effects_of_exposure_to_PFASs_on_human_health.svg
- Slide 19:
  - https://www.ewg.org/research/decades-department-defense-knew-firefighting-foams-forever-chemicals-were-dangerous
  - https://www.ewg.org/research/decades-polluters-knew-pfas-chemicals-were-dangerous-hid-risks-public
  - https://www.ewg.org/research/decades-fda-knew-toxic-forever-chemicals-were-dangerous-continued-allow-their-use
  - https://www.ewg.org/research/20-plus-years-epa-has-failed-regulate-forever-chemicals

Resources

- Slide 20:
  - 70 & 0.004 ppt https://www.federalregister.gov/documents/2022/06/21/2022-13158/lifetime-drinking-water-health-advisories-for-four-perfluoroalkyl-substances
- Slide 21:
  - https://pubs.acs.org/doi/10.1021/acs.estlett.2c00502 or https://www.ncbi.nlm.nih.gov/pmc/articles/PMC9648201/
- Slide 22:
  - https://www.ncbi.nlm.nih.gov/pmc/articles/PMC9648201/
- Slide 23:
  - https://www.ncbi.nlm.nih.gov/pmc/articles/PMC9648201/
- Slide 24:
  - https://www.govinfo.gov/content/pkg/FR-2022-09-06/pdf/2022-18657.pdf
- Slide 25:
  - https://www.govinfo.gov/content/pkg/FR-2022-09-06/pdf/2022-18657.pdf
- Slide 26:
  - https://www.saferstates.com/assets/section-images/PFAS-drinking-water-standards-7.25.2023.png
- Slide 27:
  - https://www.saferstates.com/assets/section-images/8.21.2023-AG-Action-on-PFAS-.png

Phase II Environmental Site Assessments

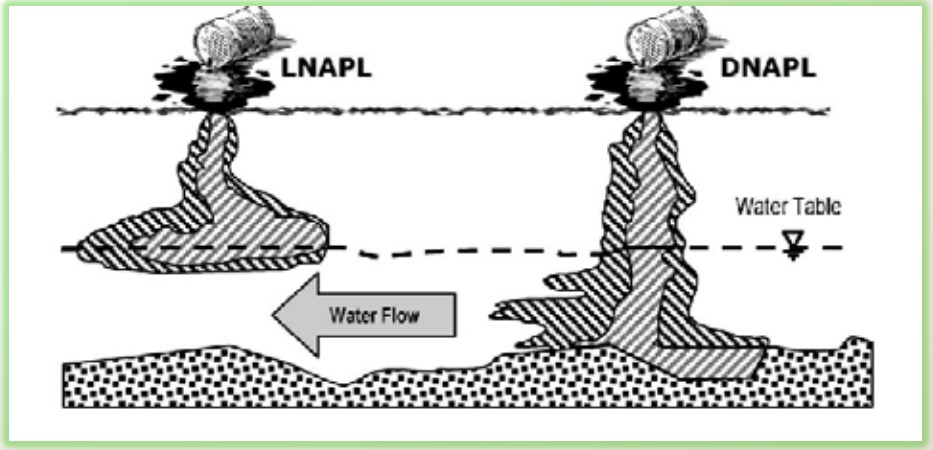
Clint Carlson

What We Will Be Covering

- Developing a Scope of Work (SOW)
- On-site Operations
- Lab Results Analysis
- Final Report

Developing the Scope of Work (SOW)

- Review of Phase I ESA and any other pertinent reports
  - Site characteristics
    - Depth to groundwater and anticipated flow direction/gradient
    - Soil composition
- Identifying the potential chemicals of concern (COCs)
  - Common trends with contamination
    - Transport methods
      - Metals vs. volatiles
      - Light non-aqueous phase liquids (LNAPL) vs. dense non-aqueous phase liquids (DNAPL)
    - Common contamination locations



Flores, Giancarlo & Katsumi, Takeshi & Inui, Toru & Kamon, Masashi. (2011). A Simplified Image Analysis Method to Study LNAPL Migration in Porous Media. Soils and Foundations. 51. 835-847. 10.3208/sandf.51.835.

Developing the Scope of Work (SOW)

- Soil borings and monitoring wells
  - Sufficient for investigating identified concerns
  - Preliminary site plan
- Anticipated sampling
- Common challenges
  - Access limitations
  - Prevention of new migration pathways
- Final SOW

On-site Operations

Steps Before Drill Date

- Coordination with involved parties
- Utility locating
  - Dig tickets

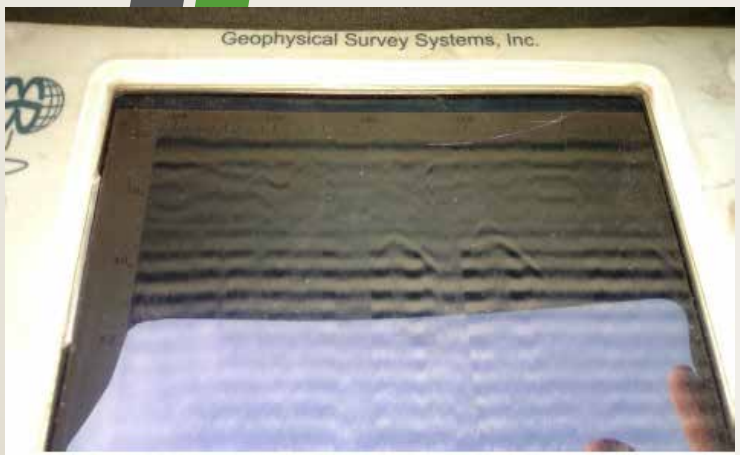
811®

Know what's **below.**
Call before you dig.

On-site Operations

Drill Date – First Steps

- Private utility locating
  - Ground penetrating radar (GPR)
- Modifications to SOW
  - Utilities concerns
  - Other impediments
- “Tailgate Talk”
  - Briefing for all individuals on-site on plans for the day
  - Health and Safety Plan (HASP) review
    - Personal protective equipment (PPE)



Site Photograph 2 – Photo of GPR field screen showing evidence of tank subsurface

Site Photograph 1 – Location of the GPR identified underground storage tank

On-site Operations

Soil Boring Installation

- Hand auger vs. mechanical
  - Direct push
  - Auger/ hollow-stem
- ‘Refusal’
- Split spoon core sampling

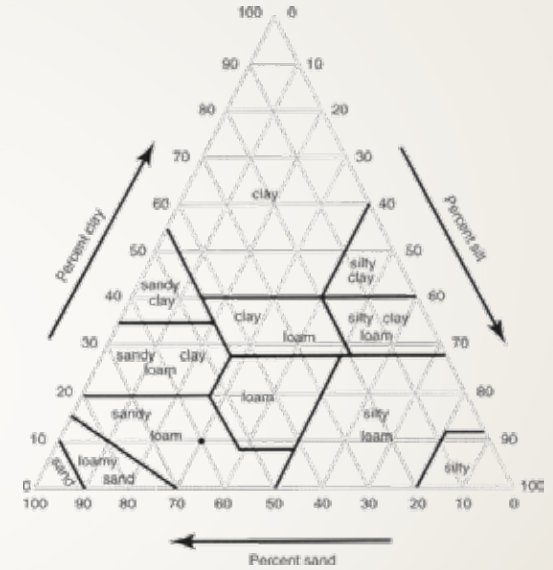
https://geoprobe.com/

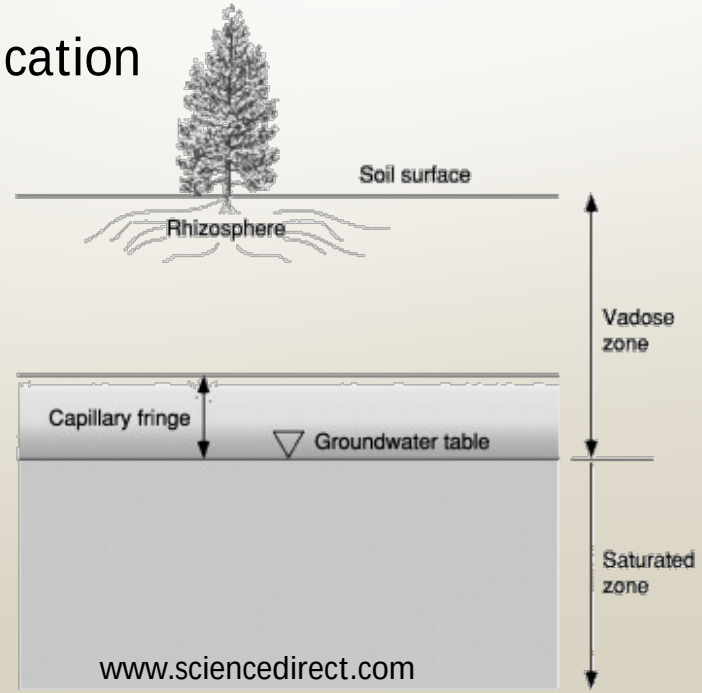
https://nndrilling.com/soil-sampling-equipment/

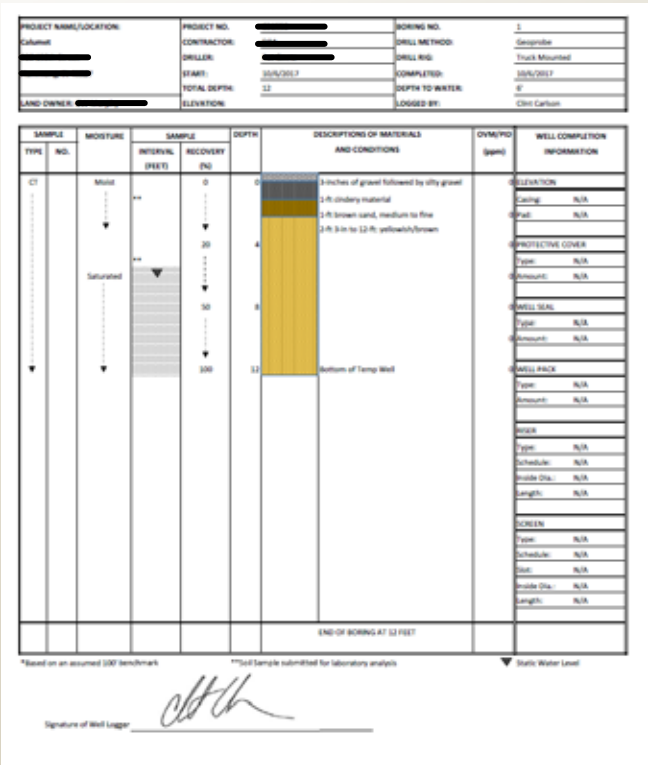
On-site Operations

Soil Boring Sampling

- Soil characterization
  - Sand vs. silt vs. clay
  - Impact of porosity
  - General horizons and stratification
    - Vadose zone
    - Capillary fringe
    - Groundwater table







On-site Operations

Soil Boring Sampling

- Screening for contamination
  - Sectioning the core
  - Photoionizing Detector (PID) readings
    - Atmosphere is pulled through the device and assessed for the presence of VOCs
    - Most common method of field detection
  - Multi-Gas Detector / 4 Gas Meter
    - Common for sampling at sites with known hazardous atmospheres
  - Visual observations

https://www.raecorents.com/

On-site Operations

Soil Sample Collection

- Collection of the samples
  - Targeting high TOV, groundwater interface, or other evidence of contamination
  - VOCs/SVOCs/PAHs
    - Additives and temperature control for preservation
  - Metals
    - No volatilization concerns
  - Composite soil sampling for shallow investigations

On-site Operations

Monitoring Well Sampling

https://fieldtech.tech/

- Temporary
  - Most common for Phase II investigations
  - PVC piping with 5’-10’ screen
  - Filter material (sand) and bentonite seal
- Permanent
  - Long-term sampling
  - Stainless steel is preferred
    - PVC often acceptable based on anticipated COCs
  - Protective casing to prevent tampering and incidental damage
- Well abandonment process

On-site Operations

Groundwater Sample Collection

- Well development and purging
  - Takes time for groundwater to stabilize
  - Purging via peristaltic pump or bailers
    - Turbidity and degassing concerns
    - Low-flow sampling if using peristaltic pump
- Sampling procedure
  - Peristaltic pumps, bailers, check/foot valves
  - Submersible pumps
  - Visual observations
  - Olfaction

https://www.pine-environmental.com/

On-site Operations

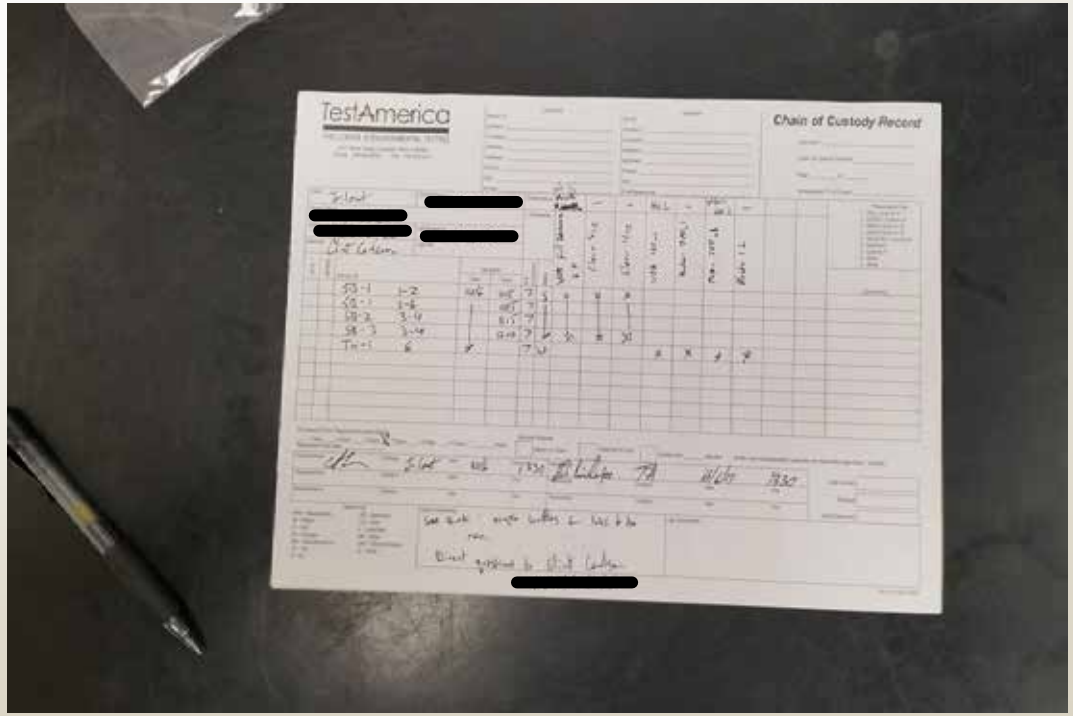
Soil Vapor Sampling

- Sub-slab vs. vapor point
  - Sealing from ambient air influence
    - Lab-grade helium shroud
    - Purging
- Common sampling vessel is a Summa cannister (1L/6L)
  - Grab-sample
  - Integrated sample utilizing a flow controller/regulator
    - 8 hour & 24 hour regulators

On-site Operations

Sampling Completed

- Confirm all documentation is in order
  - Samples correctly labeled
  - Chain of Custody (CoC)
- Cooler pack and ship to lab
- Shut down the site
  - Waste materials are being addressed to the correct standards
  - Decontamination of equipment

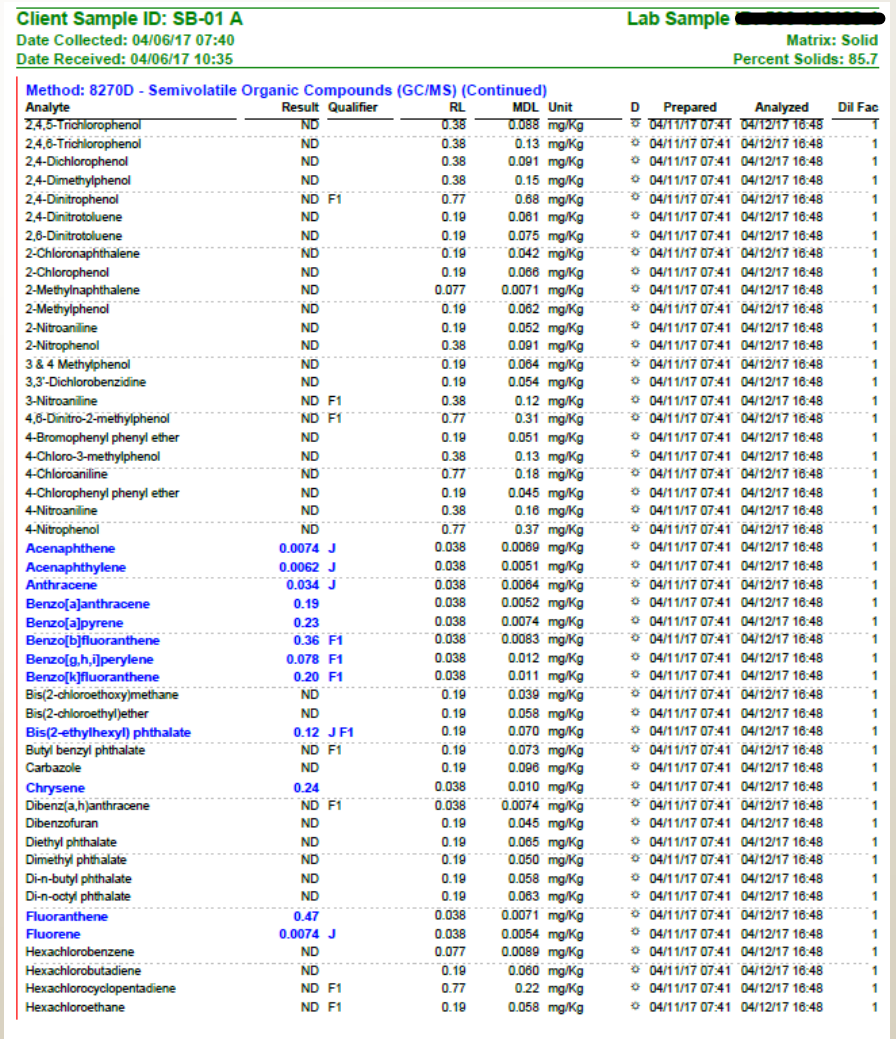


Lab Results Analysis

- Lab accreditation
  - Good standing at state and federal levels
  - Proficiency in satisfying USEPA methodology requirements
- Common soil and groundwater analysis methods
  - VOCs – 8260
  - SVOCs/PAHs – 8270
  - RCRA metals – 6010/6020
- Soil gas vapor
  - TO-15 (more comprehensive than TO-14)

Lab Results Analysis

- Detailed report
  - Analyte
  - Concentration
  - Method detection limit (MDL)
  - Reported detection limit (RDL)
  - Dilutions and spikes
- Sample labels and CoC information integration
  - Ex. SB-03 6-8’



Client Sample ID: SB-01 A — **Lab Sample** [redacted]
Date Collected: 04/06/17 07:40 — Matrix: Solid
Date Received: 04/06/17 10:35 — Percent Solids: 85.7

Method: 8270D - Semivolatile Organic Compounds (GC/MS) (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
2,4,5-Trichlorophenol	ND		0.38	0.088	mg/Kg	☼	04/11/17 07:41	04/12/17 16:48	1
2,4,6-Trichlorophenol	ND		0.38	0.13	mg/Kg	☼	04/11/17 07:41	04/12/17 16:48	1
2,4-Dichlorophenol	ND		0.38	0.091	mg/Kg	☼	04/11/17 07:41	04/12/17 16:48	1
2,4-Dimethylphenol	ND		0.38	0.15	mg/Kg	☼	04/11/17 07:41	04/12/17 16:48	1
2,4-Dinitrophenol	ND	F1	0.77	0.68	mg/Kg	☼	04/11/17 07:41	04/12/17 16:48	1
2,4-Dinitrotoluene	ND		0.19	0.061	mg/Kg	☼	04/11/17 07:41	04/12/17 16:48	1
2,6-Dinitrotoluene	ND		0.19	0.075	mg/Kg	☼	04/11/17 07:41	04/12/17 16:48	1
2-Chloronaphthalene	ND		0.19	0.042	mg/Kg	☼	04/11/17 07:41	04/12/17 16:48	1
2-Chlorophenol	ND		0.19	0.066	mg/Kg	☼	04/11/17 07:41	04/12/17 16:48	1
2-Methylnaphthalene	ND		0.077	0.0071	mg/Kg	☼	04/11/17 07:41	04/12/17 16:48	1
2-Methylphenol	ND		0.19	0.062	mg/Kg	☼	04/11/17 07:41	04/12/17 16:48	1
2-Nitroaniline	ND		0.19	0.052	mg/Kg	☼	04/11/17 07:41	04/12/17 16:48	1
2-Nitrophenol	ND		0.38	0.091	mg/Kg	☼	04/11/17 07:41	04/12/17 16:48	1
3 & 4 Methylphenol	ND		0.19	0.064	mg/Kg	☼	04/11/17 07:41	04/12/17 16:48	1
3,3'-Dichlorobenzidine	ND		0.19	0.054	mg/Kg	☼	04/11/17 07:41	04/12/17 16:48	1
3-Nitroaniline	ND	F1	0.38	0.12	mg/Kg	☼	04/11/17 07:41	04/12/17 16:48	1
4,6-Dinitro-2-methylphenol	ND	F1	0.77	0.31	mg/Kg	☼	04/11/17 07:41	04/12/17 16:48	1
4-Bromophenyl phenyl ether	ND		0.19	0.051	mg/Kg	☼	04/11/17 07:41	04/12/17 16:48	1
4-Chloro-3-methylphenol	ND		0.38	0.13	mg/Kg	☼	04/11/17 07:41	04/12/17 16:48	1
4-Chloroaniline	ND		0.77	0.18	mg/Kg	☼	04/11/17 07:41	04/12/17 16:48	1
4-Chlorophenyl phenyl ether	ND		0.19	0.045	mg/Kg	☼	04/11/17 07:41	04/12/17 16:48	1
4-Nitroaniline	ND		0.38	0.16	mg/Kg	☼	04/11/17 07:41	04/12/17 16:48	1
4-Nitrophenol	ND		0.77	0.37	mg/Kg	☼	04/11/17 07:41	04/12/17 16:48	1
Acenaphthene	0.0074	J	0.038	0.0069	mg/Kg	☼	04/11/17 07:41	04/12/17 16:48	1
Acenaphthylene	0.0062	J	0.038	0.0051	mg/Kg	☼	04/11/17 07:41	04/12/17 16:48	1
Anthracene	0.034	J	0.038	0.0064	mg/Kg	☼	04/11/17 07:41	04/12/17 16:48	1
Benzo[a]anthracene	0.19		0.038	0.0052	mg/Kg	☼	04/11/17 07:41	04/12/17 16:48	1
Benzo[a]pyrene	0.23		0.038	0.0074	mg/Kg	☼	04/11/17 07:41	04/12/17 16:48	1
Benzo[b]fluoranthene	0.36	F1	0.038	0.0083	mg/Kg	☼	04/11/17 07:41	04/12/17 16:48	1
Benzo[g,h,i]perylene	0.078	F1	0.038	0.012	mg/Kg	☼	04/11/17 07:41	04/12/17 16:48	1
Benzo[k]fluoranthene	0.20	F1	0.038	0.011	mg/Kg	☼	04/11/17 07:41	04/12/17 16:48	1
Bis(2-chloroethoxy)methane	ND		0.19	0.039	mg/Kg	☼	04/11/17 07:41	04/12/17 16:48	1
Bis(2-chloroethyl)ether	ND		0.19	0.058	mg/Kg	☼	04/11/17 07:41	04/12/17 16:48	1
Bis(2-ethylhexyl) phthalate	0.12	J F1	0.19	0.070	mg/Kg	☼	04/11/17 07:41	04/12/17 16:48	1
Butyl benzyl phthalate	ND	F1	0.19	0.073	mg/Kg	☼	04/11/17 07:41	04/12/17 16:48	1
Carbazole	ND		0.19	0.096	mg/Kg	☼	04/11/17 07:41	04/12/17 16:48	1
Chrysene	0.24		0.038	0.010	mg/Kg	☼	04/11/17 07:41	04/12/17 16:48	1
Dibenz(a,h)anthracene	ND	F1	0.038	0.0074	mg/Kg	☼	04/11/17 07:41	04/12/17 16:48	1
Dibenzofuran	ND		0.19	0.045	mg/Kg	☼	04/11/17 07:41	04/12/17 16:48	1
Diethyl phthalate	ND		0.19	0.065	mg/Kg	☼	04/11/17 07:41	04/12/17 16:48	1
Dimethyl phthalate	ND		0.19	0.050	mg/Kg	☼	04/11/17 07:41	04/12/17 16:48	1
Di-n-butyl phthalate	ND		0.19	0.058	mg/Kg	☼	04/11/17 07:41	04/12/17 16:48	1
Di-n-octyl phthalate	ND		0.19	0.063	mg/Kg	☼	04/11/17 07:41	04/12/17 16:48	1
Fluoranthene	0.47		0.038	0.0071	mg/Kg	☼	04/11/17 07:41	04/12/17 16:48	1
Fluorene	0.0074	J	0.038	0.0054	mg/Kg	☼	04/11/17 07:41	04/12/17 16:48	1
Hexachlorobenzene	ND		0.077	0.0089	mg/Kg	☼	04/11/17 07:41	04/12/17 16:48	1
Hexachlorobutadiene	ND		0.19	0.060	mg/Kg	☼	04/11/17 07:41	04/12/17 16:48	1
Hexachlorocyclopentadiene	ND	F1	0.77	0.22	mg/Kg	☼	04/11/17 07:41	04/12/17 16:48	1
Hexachloroethane	ND	F1	0.19	0.058	mg/Kg	☼	04/11/17 07:41	04/12/17 16:48	1

Lab Results Analysis

- Concentrations compared against State and Federal Regs.
  - Reviewing to identify concentrations above regulatory levels
    - “Most stringent”
    - Residential vs. Commercial
    - Inhalation vs. Ingestion vs. Dermal contact

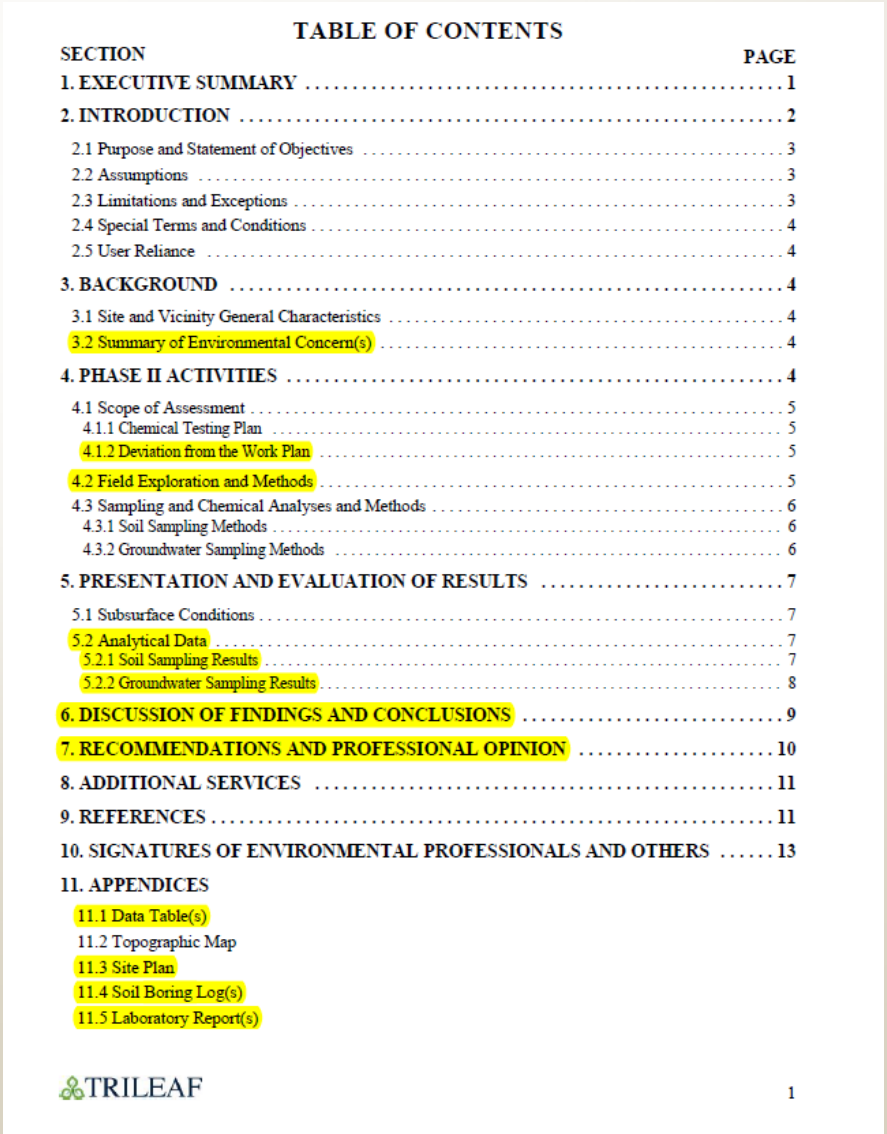
Data Collected 28-Jul-16

		IEPA TACO SROs Exposure Routes for Specific SROs								Sample ID							
		Industrial/Commercial				Construction Worker				pH							
		Ingestion	Inhalation	Class I	Class II	Ingestion	Inhalation	Class I	Class II	SB-1A	SB-1B	SB-2A	SB-2B	SB-3A	SB-3B	SB-4A	SB-4B
Method	Analyte	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	8.26	8.11	8.23	8.11	8.44	8.04	8.53	8.17
8270D	Acenaphthene	120000	NRO	570	2900	120000	NRO	570	2900	**0.019**	<0.0069	**0.13**	<0.0066	<0.0068	<0.0069	<0.0064	<0.0066
8270D	*Acenaphthylene*	61000	NRO	85	420	61000	NRO	85	420	**0.010**	<0.0051	**0.018**	<0.0049	<0.0050	<0.0051	<0.0047	<0.0049
8270D	Anthracene	610000	NRO	12000	59000	610000	NRO	12000	59000	**0.12**	<0.0064	**1.0**	<0.0062	<0.0064	<0.0064	<0.0060	<0.0062
8270D	Benzo[a]anthracene	8	NRO	2	8	170	NRO	2	8	**1.7**	<0.0052	**6.8**	**0.067**	**0.022**	**0.058**	<0.0048	**0.0062**
8270D	Benzo[a]pyrene	0.8	NRO	8	82	17	NRO	8	82	**2.6**	<0.0074	**11**	**0.081**	**0.019**	**0.061**	<0.0069	<0.0072
8270D	Benzo[b]fluoranthene	8	NRO	5	25	170	NRO	5	25	**5.4**	<0.0083	**15**	**0.15**	**0.038**	**0.11**	<0.0077	<0.0080
8270D	*Benzo[g,h,i]perylene*	61000	NRO	27000	130000	61000	NRO	27000	130000	**0.99**	<0.012	**5.4**	**0.036**	**0.017**	**0.034**	<0.012	<0.012
8270D	Benzo[k]fluoranthene	78	NRO	49	250	1700	NRO	49	250	**1.2**	<0.011	**5.4**	**0.065**	**0.015**	**0.044**	<0.011	<0.011
8270D	Chrysene	780	NRO	160	800	17000	NRO	160	800	**1.7**	**0.018**	**8.6**	**0.083**	**0.023**	**0.066**	<0.0098	**0.018**
8270D	Dibenz(a,h)anthracene	0.8	NRO	2	7.6	17	NRO	2	7.6	**0.26**	<0.0074	**1.5**	**0.0099**	<0.0074	<0.0074	<0.0069	<0.0071
8270D	Fluoranthene	82000	NRO	4300	21000	82000	NRO	4300	21000	**2.1**	<0.0071	**12**	**0.12**	**0.026**	**0.10**	<0.0066	**0.012**
8270D	Fluorene	82000	NRO	560	2800	82000	NRO	560	2800	**0.012**	<0.0054	**0.067**	<0.0052	<0.0054	<0.0054	<0.0050	<0.0052
8270D	Indeno[1,2,3-cd]pyrene	8	NRO	14	69	170	NRO	14	69	**0.89**	<0.0099	**6.4**	**0.033**	**0.016**	**0.026**	<0.0093	<0.0096
8270D	Naphthalene	41000	270	12	18	4100	1.8	12	18	**0.0099**	**0.028**	**0.025**	**0.017**	<0.0059	**0.042**	<0.0055	**0.016**
8270D	*Phenanthrene*	61000	NRO	210	1100	61000	NRO	210	1100	**0.28**	**0.067**	**1.5**	**0.080**	**0.015**	**0.096**	<0.0050	**0.051**
8270D	Pyrene	61000	NRO	4200	21000	61000	NRO	4200	21000	**2.4**	**0.012**	**13**	**0.13**	**0.033**	**0.12**	<0.0071	**0.015**

* Exposure Routes for Soil Remediation Objectives (SROs) are based on
Title 35 Part 742 Tier 1 Appendix B Table B, C and D.
All results are mg/Kg and dry weight unless otherwise requested
Note 1: Results that are Bolded and Shaded indicate that the measured concentration exceeds any one of the SROs.
Note 2: Class I and Class II SROs are based on pH according to Tables C and D for Title 35 indicated analytes.
NRO = (No Remediation Objective) was provided in tables.
NRO/NRO* indicates that pH analysis was not requested and the values for Class I and Class II can not be provided.
Non TACO analytes are italicized and limits are based on the Illinois EPA Toxicity Assessment Unit Oct 30, 2012.
Additional analytes may have been requested but are not contained in the
non-TACO or TACO Tier 1 tables and are not evaluated.
Estimated results that are between the MDL and RL (J flags) may be reported but are not indicated with a flag.
Please refer to the report.
Results may have been achieved by a dilution and are not indicated with a flag. Please refer to the report.
3&4-Methylphenol do not separate analytically on the columns and are reported as combined analytes.
These footnotes are not an all inclusive list from Section 742 Appendix B Tier 1 Tables A through H.
For a complete detailed list see Section 742 Appendix B Tier 1 Tables A through H.

Final Report

- Key sections of the final report:
  - Reason for investigation
  - Field work summary
    - Identified deviations
  - Summary of results
  - Final discussion, conclusions, and recommendations
  - Site Plan
  - Soil characterization/ boring logs
  - Analytical tables
  - Laboratory report
    - Chain of Custody



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Questions?