

JERSEY WATERWORKS CONFERENCE 2023

DECEMBER 13, 2023 | THE COLLEGE OF NEW JERSEY, EWING

The Value Of Water | New Jersey
Edition

www.jerseywaterworks.org info@jerseywaterworks.org



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DECEMBER 13, 2023 | THE COLLEGE OF NEW JERSEY, EWING

Let's Talk About PFAs and Other Contaminants



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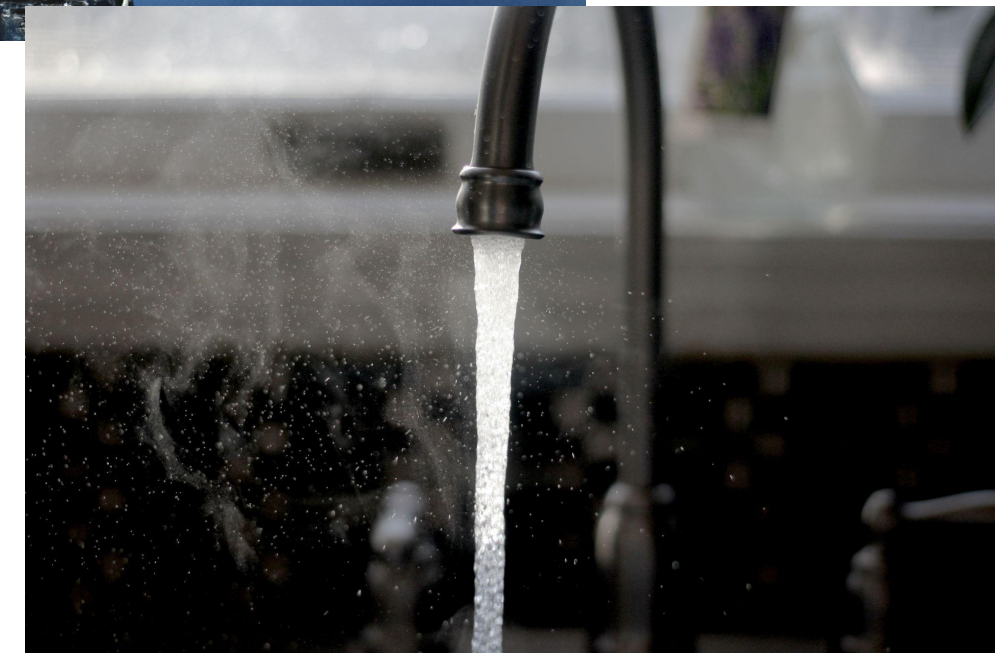


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Lets Talk PFAS: Drinking
Water





**WATER
RESOURCE
MANAGEMENT**

NJDEP PFAS MCL Implementation

12/13/2023 JWW Conference

NJDEP WRM PFAS Timeline

**New Jersey's
PFNA MCL was
1st MCL for any
PFAS in the U.S.**

2005-2006	PFOA detected in tap water (2005) and wells (2006) of a NJ public water system (PWS) near an industrial source.
2007	NJDEP issued PFOA chronic (lifetime) drinking water guidance of 40 ng/L at request of affected PWS.
2006 & 2009	NJDEP conducted first statewide studies of PFAS in drinking water in the U.S.
2013 - 2015	PFOA & PFNA found more frequently in NJ PWS than nationally in national USEPA study Unregulated Contaminant Monitoring Rule (UCMR3).
2014	NJDEP Commissioner asked the Drinking Water Quality Institute (DWQI) to recommend MCLs for PFNA, PFOA & PFOS.
2018- 2020	Adopted MCLs & GWQS for PFNA (13ng/L), PFOA (14 ng/L), and PFOS (13 ng/L) and added them to Private Well Testing Act (PWTA).
2022 – 2023	Stakeholder for SWQS for PFNA, PFOA, and PFOS
2023	AO to encourage the collection of data that will aid in the Department's efforts to identify, reduce, and eliminate sources of PFAS in wastewater and its residuals
2023 - 2026	UCMR 5 much wider range of PFAS compounds.



PFAS Drinking Water MCL Implementation



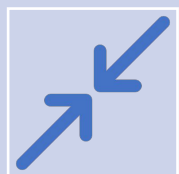
NJDEP proposed and adopted MCLs based on the DWQI* recommendations for PFNA (2018) and PFOA & PFOS (2020).



Monitoring requirements for PFNA became effective in 2019 for groundwater CWSs with fewer than 10,000 customers and NTNC water systems.



DEP recommended systems also analyze for PFOS and PFOA to better prepare for the pending PFOA/PFOS standards and considered those findings for systems eligible for monitoring reductions.



Continually working with systems which have exceeded the MCLs to return to compliance.

*The Drinking Water Quality Institute was established after amendments to the SDWA in 1984. They are responsible for developing MCL recommendations to the NJDEP Commissioner.

New Jersey PFAS Maximum Contaminant Levels (MCLs)

All public community water systems and public nontransient noncommunity water systems were required to initiate monitoring following the MCL adoption

Water Systems that incur an MCL violation are required to issue public notice to customers and have one-year from the date of violation to install treatment

Compound	NJ Current MCL
PFOA	14 ppt
PFOS	13 ppt
PFNA	13 ppt



Scope of PFAS Occurrence in New Jersey

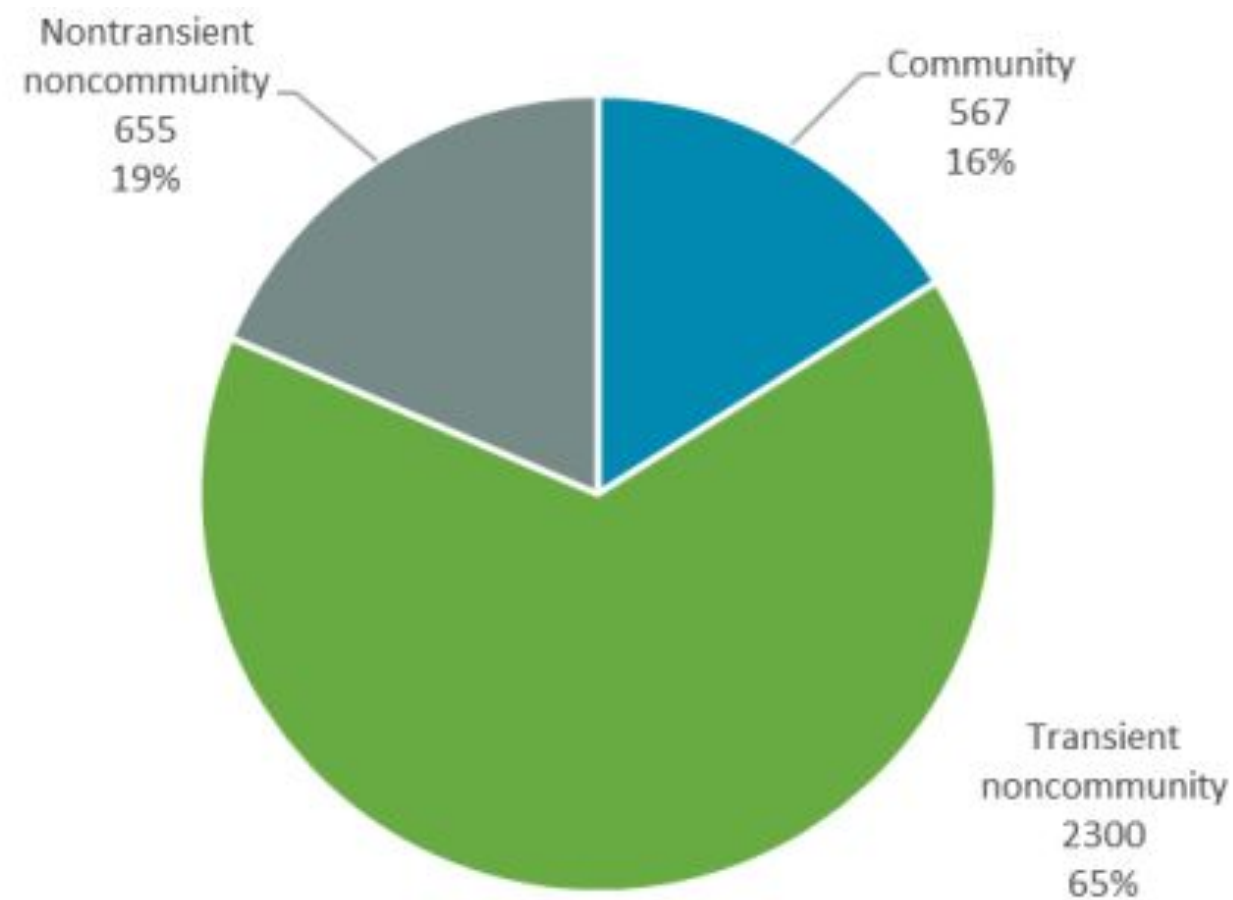


Figure 1: Distribution of 3,522 Public Water Systems in New Jersey during 2022.

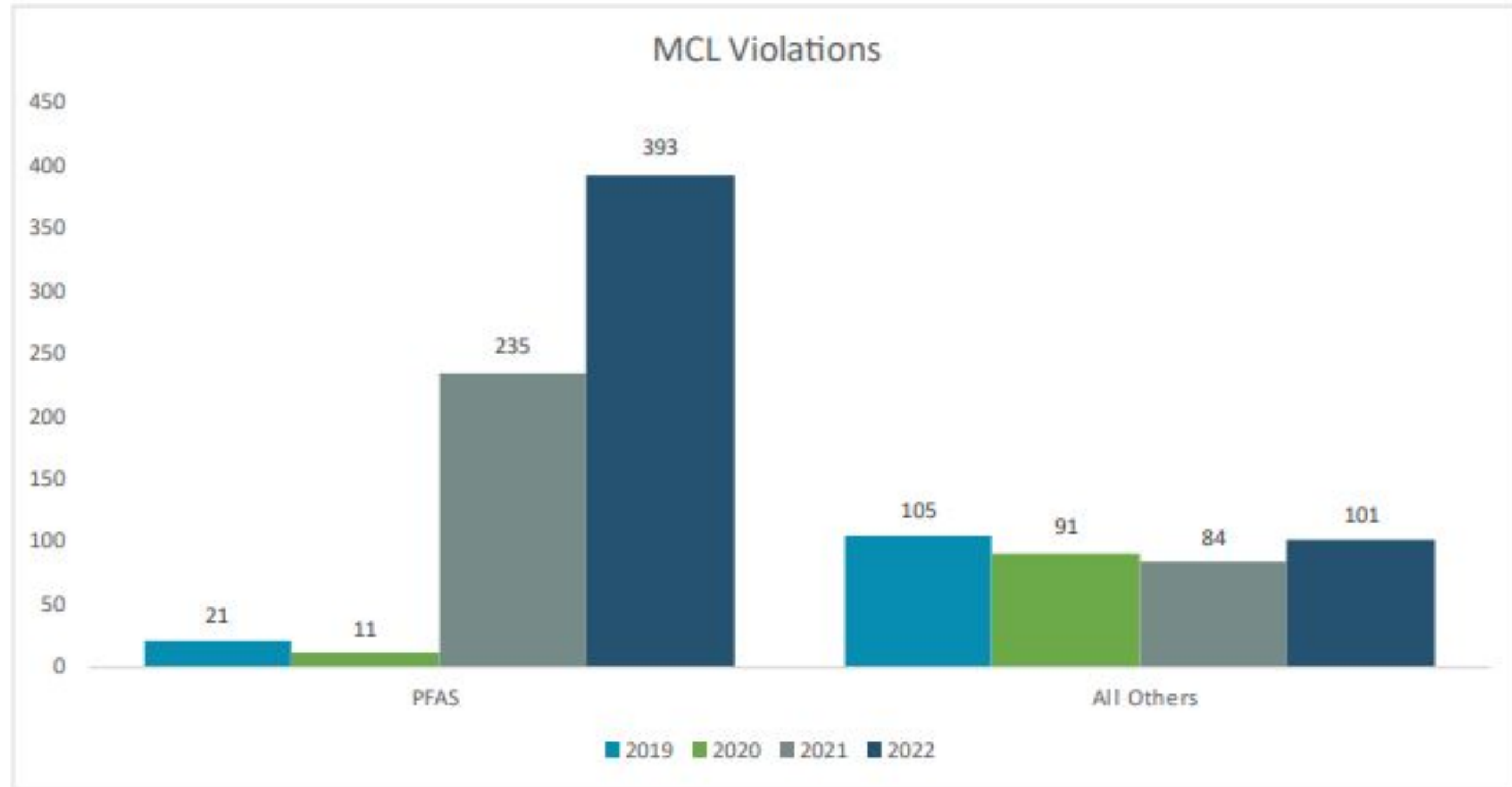
- The State of New Jersey has 3,522 Public Water Systems (2022 data), of which 1,143 systems were subject to the PFAS MCLs and monitor for PFAS.
- 89 water systems in total have incurred a PFAS MCL violation through 2nd quarter 2023
 - 73 of these water systems are small water systems, which makes up 82% of the water systems that need to take action
- The table below shows the breakdown of the systems that have incurred an MCL violation:

System Type & Population Size	# of systems	# of points of entry (POEs)
CWS >10,000	15	51
CWS ≤3300	20	22
CWS 3301-10,000	10	19
NTNC/ NC (1)	44	45



Impact on DW Standard Compliance

Figures and additional details are available from the Annual Compliance Reports at:
https://www.state.nj.us/dep/watersupply/dwc_systems.html





EPA Proposed PFAS Standards

Contaminant	NJDEP MCL (2019 & 2021)	2022 EPA Interim Health Advisory Level	2023 EPA Proposed Standards
PFOA	14 ppt	0.004 ppt	4.0 ppt (MCL)
PFOS	13 ppt	0.02 ppt	4.0 ppt (MCL)
PFNA	13 ppt	N/A	10 ppt**
PFBS	N/A	2000 ppt	2000 ppt**
Gen X	N/A	10 ppt	10 ppt**
PFHxs	N/A	N/A	9.0 ppt**

*Combined for both contaminants

** EPA has developed a combined "Hazard Index" for these PFAS, which is unitless based on a formula comparing the concentration of each contaminant



Potential Impacts of EPA Proposal

- Based on 2022 monitoring data, an estimated 229 additional water systems would exceed the EPA's proposed PFAS MCLs, with approximately 180 of them being small water systems
- This is based on existing monitoring data which **DOES NOT** include the parameters in the Hazard Index
- NJDEP has been communicating with water systems regarding the EPA proposal

	System Type and Population Size	Estimated # of Systems
NJ PFAS MCL Violations (since 2018)	CWS > 10,000	15
	CWS ≤ 3,300	20
	CWS 3,301 - 10,000	10
	NTNC/NC	44
Estimated PFAS MCL Violations (2022 data) *DOES NOT include Hazard Index	CWS > 10,000	~49
	CWS ≤ 3,300	~67
	CWS 3,301 - 10,000	~20
	NTNC	~93
TOTAL NO. OF WATER SYSTEMS:		~318



EPA's Unregulated Contaminant Monitoring Rule (UCMR) 5- Initial Findings

Contaminant	Number of PWS > EPA ref. value
PFOA	25
PFOS	12
PFBS	0
GenX	0
Lithium	15

- UCMR 5 focuses on 29 different PFAS, including the 3 with NJ MCLs, as well as lithium.
- UCMR lasts from 2023-2025.
- First data release on 8/17/2023.
- Includes data from 48 PWS
 - 35 had detections above an EPA reference concentration.
 - 23 had at least one PFAS result above an EPA Health Advisory.
 - Includes data from 5 systems which had previously exceeded one of NJ's PFAS MCLs.
- Accounts for ~7% of data expected in UCMR 5.
- Data released quarterly for the remainder of the UCMR cycle.

Treatment Technologies Used in New Jersey



PFAS Permits Approved	GAC	AIX	Other (adsorptive media)
Permits with flow \leq 1 MGD	12	35	1
Permits with flow $>$ 1 MGD	31	12	0
Total Number of Permits	43	47	1

Construction Permits Approved: 91
Placed into Service: 36



Summary of Available PFAS Funding

There are several funding options available for funding PFAS Treatment:

Emerging Contaminants in Small or Disadvantaged Communities program (EC-SDC)

- EPA grant to states intended to assist small or disadvantaged communities improve their drinking water quality
- Designed to address emerging contaminants such as PFAS, 1,4-dioxane, and others
- EPA total funding is \$5 Billion over 5 years
- NJ Funding ~ \$66 Million allotted for FY2022 & FY2023, with additional funding expected in subsequent years

Drinking Water State Revolving Fund (DWSRF)

- Nano projects could be eligible for PF to address PFAS
- BIL emerging contaminants funding , including PFAS
 - \$13 million in PF available
 - Approximately \$4 million will be awarded to disadvantaged communities who meet NJ's affordability criteria
 - \$1 million cap on PF per applicant per year



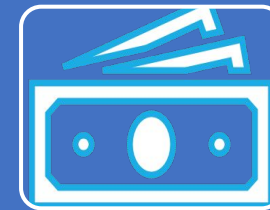
NJTAP- NJ Technical Assistance Program



No cost assistance!



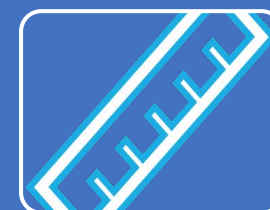
Program Navigation



Financial and Needs Assessments



Community Engagement



Engineering Services (DW only)

Focus to assist Water Systems that:

- **Serve Disadvantaged Communities** with Lead, PFAS, and SDWA compliance issues, CSOs, sewer infrastructure rehab and upgrades, and more.
- **May lack sufficient resources** to perform full assessment of needs (e.g. LSLIs, AMPs, CIPs)
- **May lack financial, managerial, and/or community support** for infrastructure projects and require assistance with stakeholder outreach & engagement.
- **May not be aware of funding opportunities or lack familiarity** and comfort with navigating Water Bank program application processes.
- **May need eventual engineering services** to assist with planning and design.

Technical Assistance Request form on our website to apply directly: <https://www.nj.gov/dep/wiip/request.html>



Thank you!





AMERICAN WATER

PFAS Treatment in Drinking Water

Nicole Wiley, P.E.

Engineering Practice Lead

American Water Operations

We operate as regulated utilities in 14 U.S. states.
Our primary operating assets include approximately:

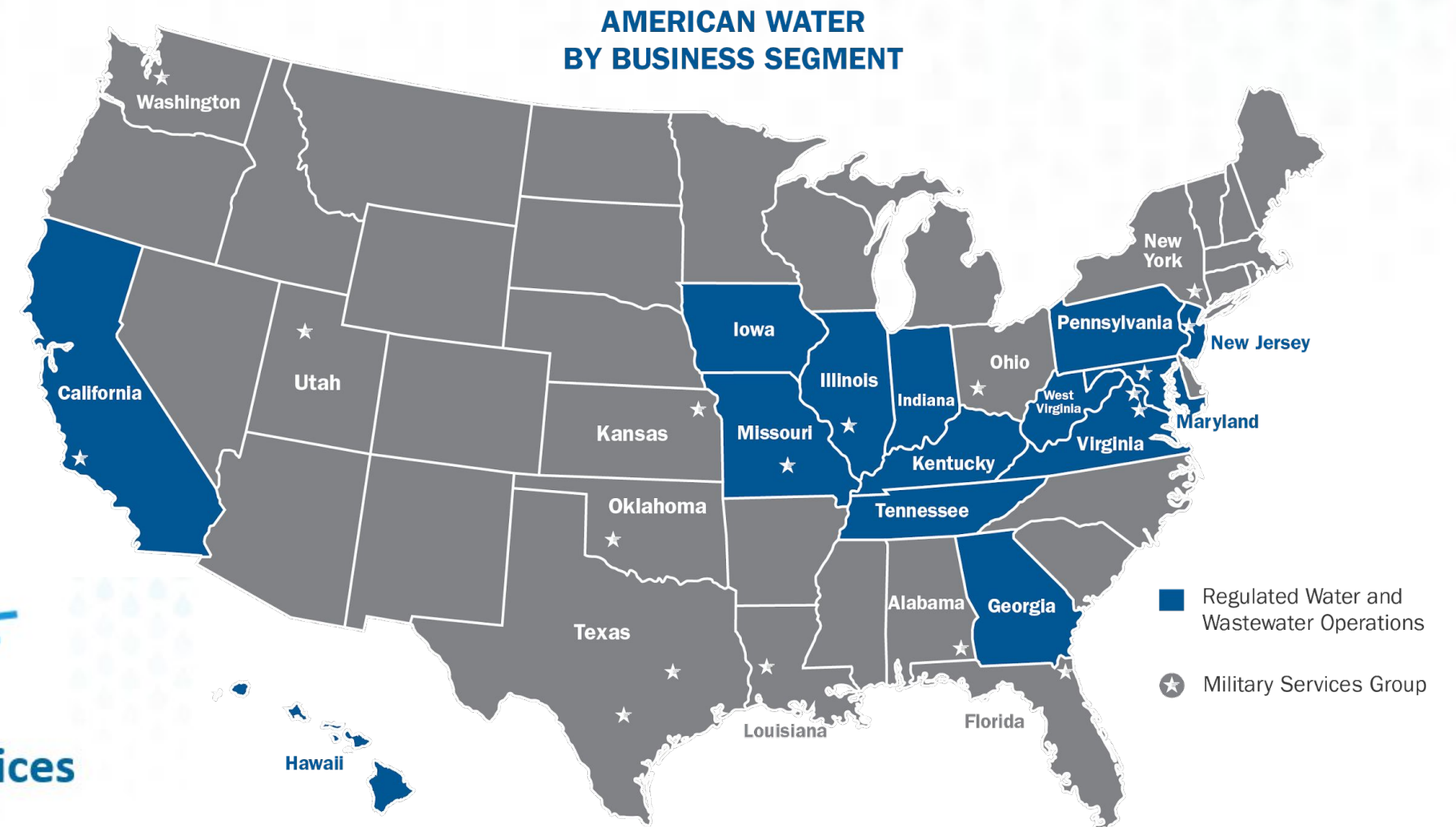
- 80 surface water treatment plants
- 490 groundwater treatment plants
- 175 wastewater treatment plants
- 53,500 miles of transmission, distribution collection mains and pipes
- 1,100 groundwater wells
- 1,700 water and wastewater pumping stations
- 1,100 treated water storage facilities
- 73 dams



Military Services

American Water's Military Services Group partners with the Department of Defense through the Utilities Privatization ("UP") Program.

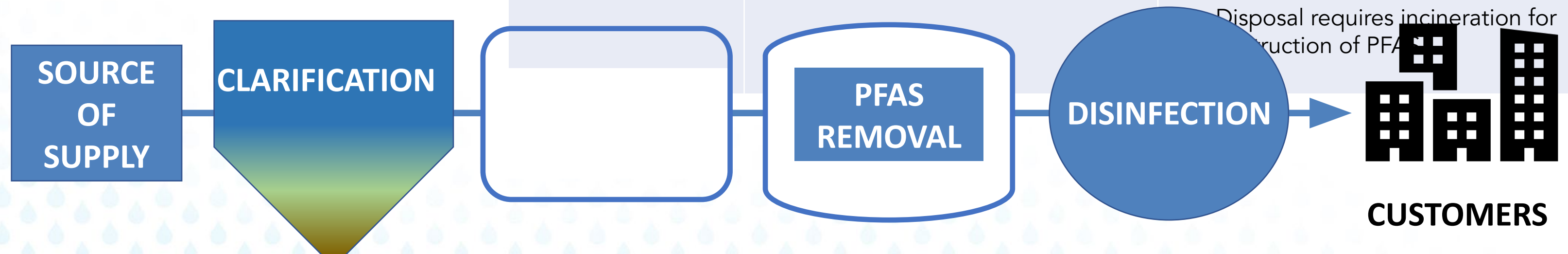
Through UP, our 50-year contracts allow us to serve as the water and/or wastewater utility system owner at 18 military installations across the U.S.



PFAS Treatment Summary



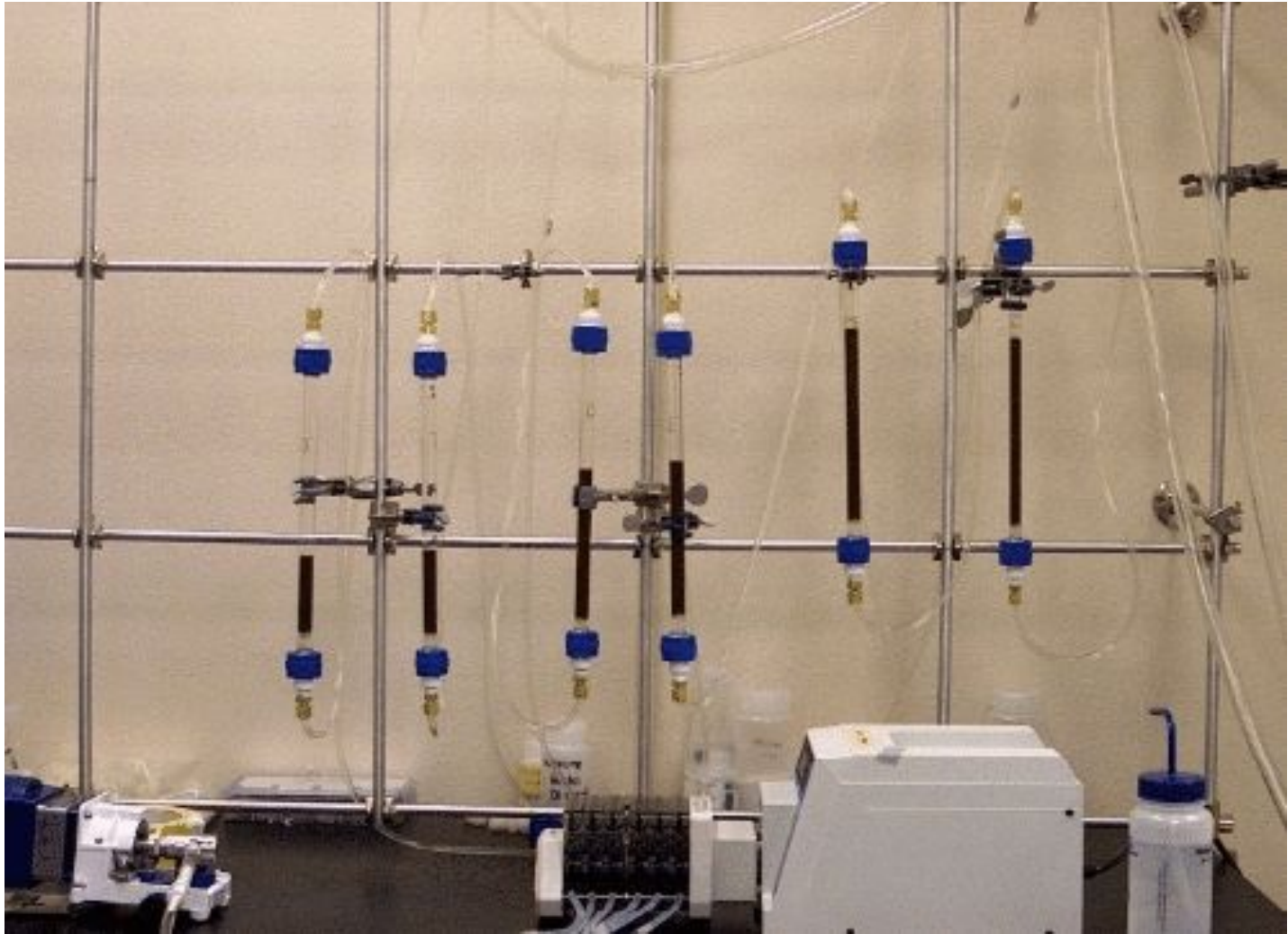
TECHNOLOGY	ADVANTAGES	DISADVANTAGES
Granular Activated Carbon (GAC)	<ul style="list-style-type: none"> • Easy to use • Reactivation offers destruction of PFAS • Provides removal of other contaminants of emerging concern • Beneficial tool for "common" hazardous chemical spills • Taste and odor benefit 	<ul style="list-style-type: none"> • Larger footprint than IX • Iron and manganese removal sometimes required upstream of GAC • (Generally) higher capital expenses than IX • More frequent replacement of GAC than IX (but much lower cost on a per pound basis)
Ion Exchange (IX)	<ul style="list-style-type: none"> • Easy to use • Smaller footprint than GAC 	<ul style="list-style-type: none"> • Pre-filtration usually required • Iron and manganese removal more often required upstream of IX than for GAC • Concern with fouling in surface water treatment • Dechlorination (as needed) to prevent NDMA <p>Disposal requires incineration for destruction of PFAS</p>



American Water Approach



Bench- and Pilot-Scale Studies



Rapid Small Scale Column Test (RSSCT)



Pilot Testing

Full-Scale PFAS Treatment



Ion Exchange Vessels



Granular Activated Carbon Adsorption Vessels

—
Thank you!
—

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Lets Talk PFAS:Waste Water





WATER RESOURCE MANAGEMENT

Division of Water Quality Strategy for Addressing PFAS in Wastewater

Susan Rosenwinkel

Assistant Director

Water Pollution Management Element

December 13, 2023

NJDEP - Division of Water Quality Website

Home 

PFAS Topics ▾

About PFAS in NJ

Rules and Regulations ▾


Resources ▾

Contact

DWQ Home

Addressing PFAS in Wastewater: Track Down, Reduce, and Eliminate Sources of PFAS

[What is PFAS?](#)

On January 17, 2023, the Commissioner signed [Administrative Order 2023-01](#)  to encourage the collection of data that will aid in efforts to identify, reduce and eliminate sources of PFAS in wastewater and its residuals.



**Discharge to Surface Water and
Pretreatment Permits**

[Read more](#)



**Discharge To Ground Water
Permits**

[Read more](#)



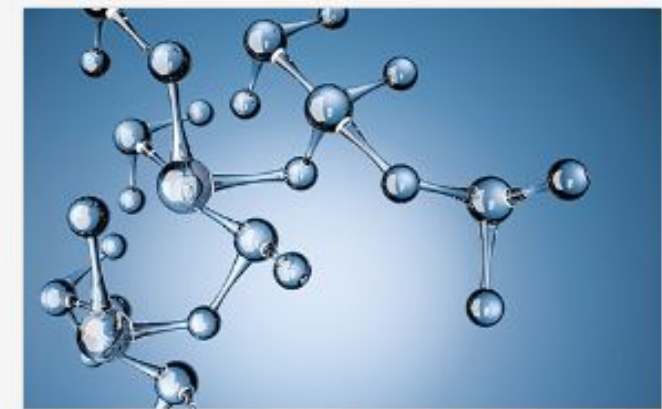
**Sewage Sludge and Residuals
Permits**

[Read more](#)



Mapping

COMING SOON!



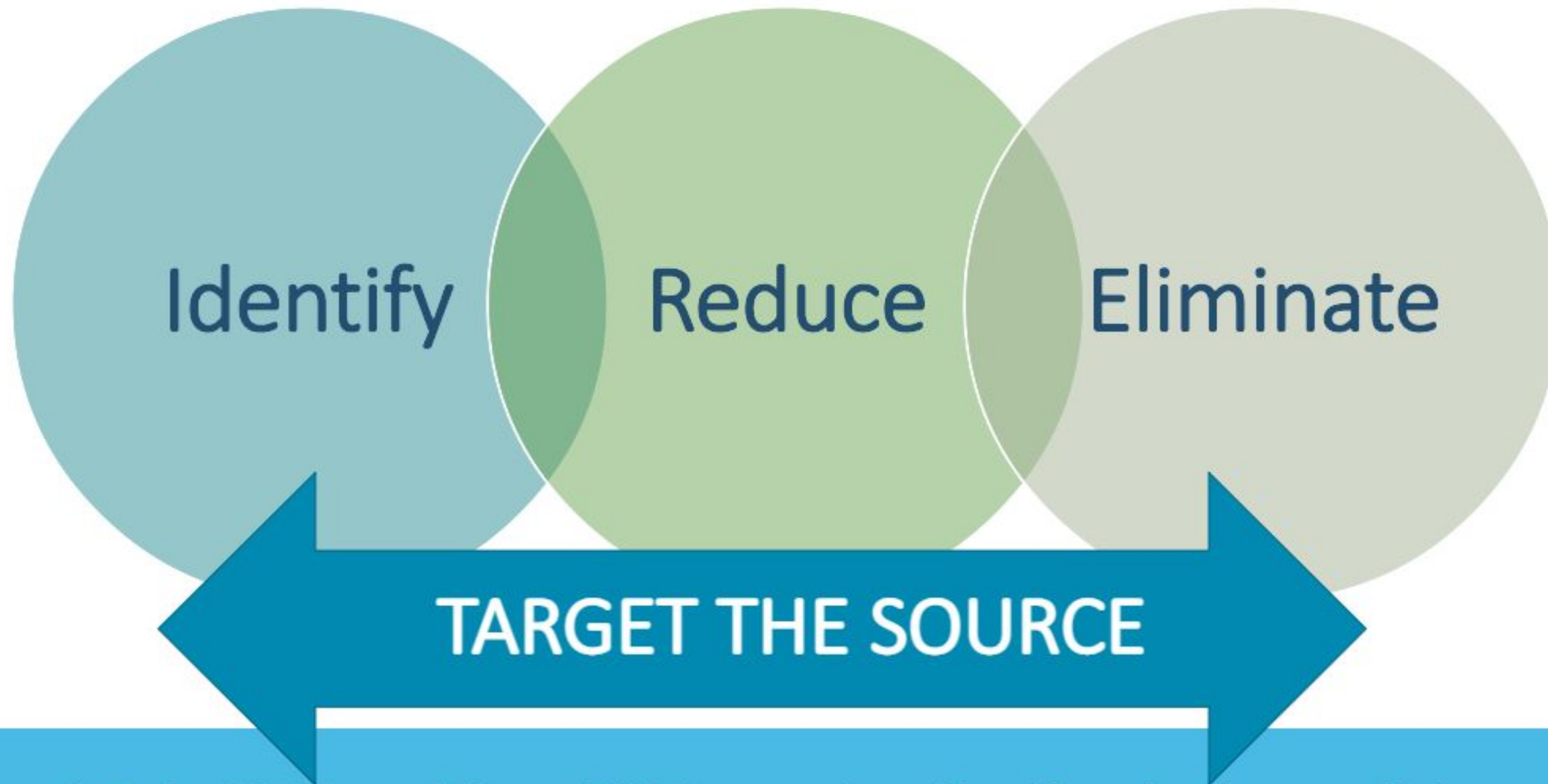
DEP PFAS

[Read more](#)

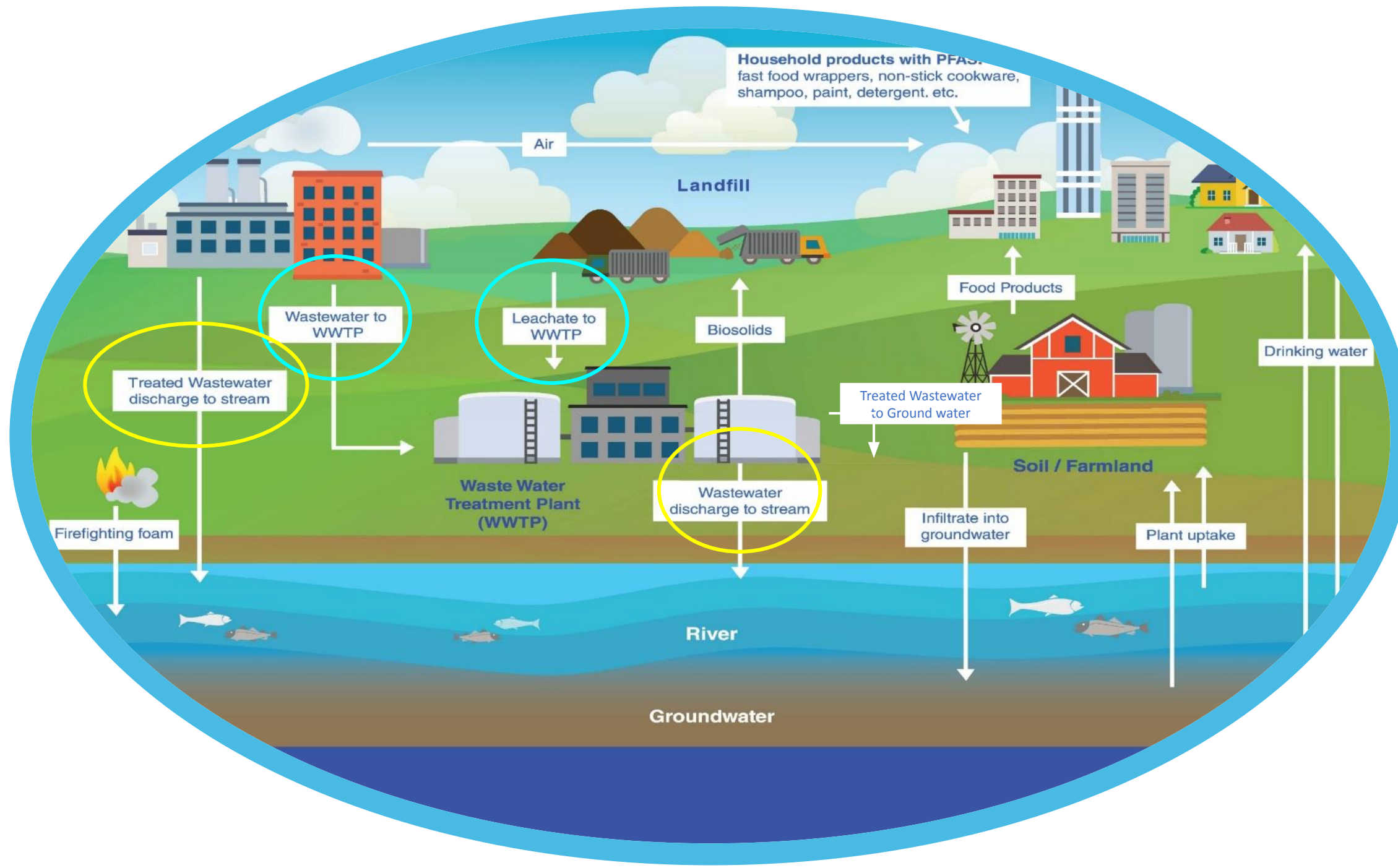


<https://www.nj.gov/dep/dwq/pfas.htm>

GOAL OF DWQ PFAS APPROACH



Surface Water and Pretreatment



- **Surface Water**

- Industrial Facilities discharging treated wastewater directly to Surface Water

- **Pretreatment**

- Industrial facilities discharging wastewater to a POTW
- Industrial facilities regulated by a Delegated Local Agency



Surface Water and Pretreatment FACTORS CONSIDERED



Publicly Owned Treatment Works (POTWs) do not typically use or generate PFAS

Conventional Treatment Technology is not designed to remove PFAS

Treatment technology for PFAS at POTWs may not be viable at this time

Treatment technologies for POTWs is emerging, but more research is needed

TARGET THE SOURCE





Let's Talk about PFAS

(Wastewater Utility Perspective)

Presented at:

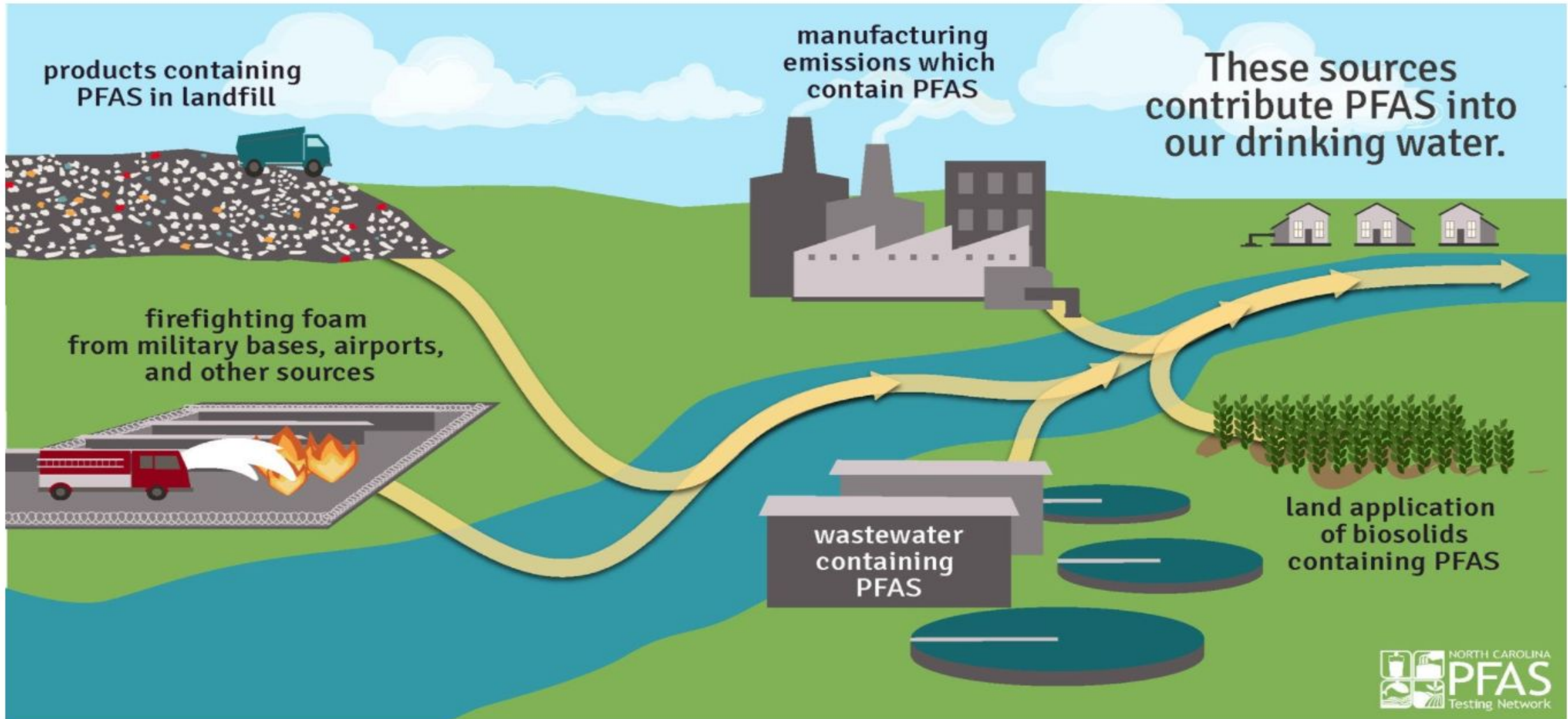
Jersey Water Works 2023 Conference
December 13, 2023

Presented by:

James Cosarove, PE

The logo for ONE WATER CONSULTING LLC features a circular icon with a stylized water drop and wave, followed by the text "ONE WATER" in a bold, green, sans-serif font, and "CONSULTING LLC" in a smaller, blue, sans-serif font below it.

PFAS Sources



PFAS Exposure Routes

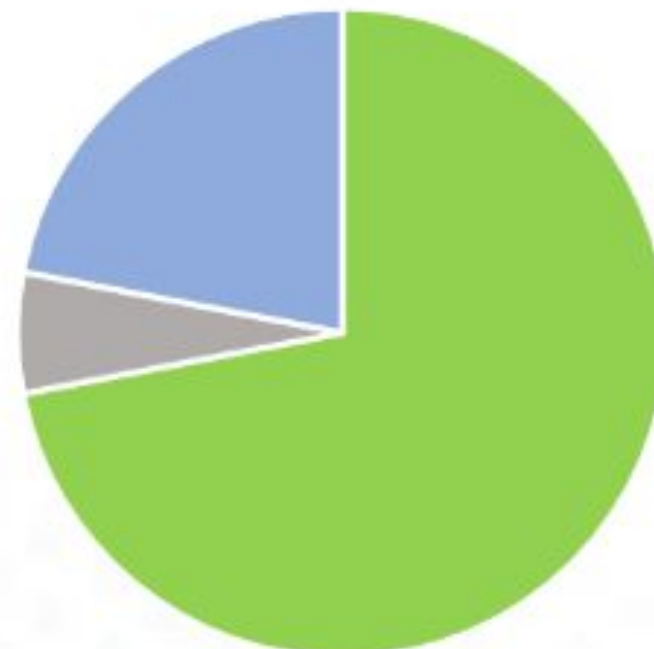


PFOA Exposure Routes



- Diet
- Dust
- Water

PFOS Exposure Routes



- Diet
- Dust
- Water

Ref: Journal of Exposure Science and Environmental Epidemiology, 2011.

Concerning Issues for WWTPs



- WWTPs receive waste... they don't create it
- Lack of experience with ww treatment
 - Most experience on drinking water side
- **Conventional ww treatment can break down polyfluorinated compounds into perfluorinated compounds**
 - **PFOA and PFOS can be higher in effluent than influent!**
- Disposal of residuals
 - May be classified as CERCLA hazardous substance



- Air emissions

Existing NJ Standards



Contaminant	Drinking Water (ppt)	Groundwater (ppt)
PFOA	14	14
PFOS	13	13
PFNA	13	13

No stream standards yet; NJDEP proposing soon!



AEA Monitoring Plan



- Provides guidance on:
 - Sampling Schedule
 - Sampling Protocol
 - Influent Sampling
 - Effluent Sampling
 - Residuals/Sludge Sampling
 - Duplicates and Blanks
 - Sample Bottles and Labeling
 - Sample Handling and Custody
 - Sample Storage
 - Sample Pickup or Shipping
 - Results and Data Sharing

**PFAS
BASELINE MONITORING PLAN
FOR
NEW JERSEY
WASTEWATER TREATMENT FACILITIES**

**Prepared by:
Association of
Environmental Authorities**



**Prepared for:
AEA Wastewater Members**

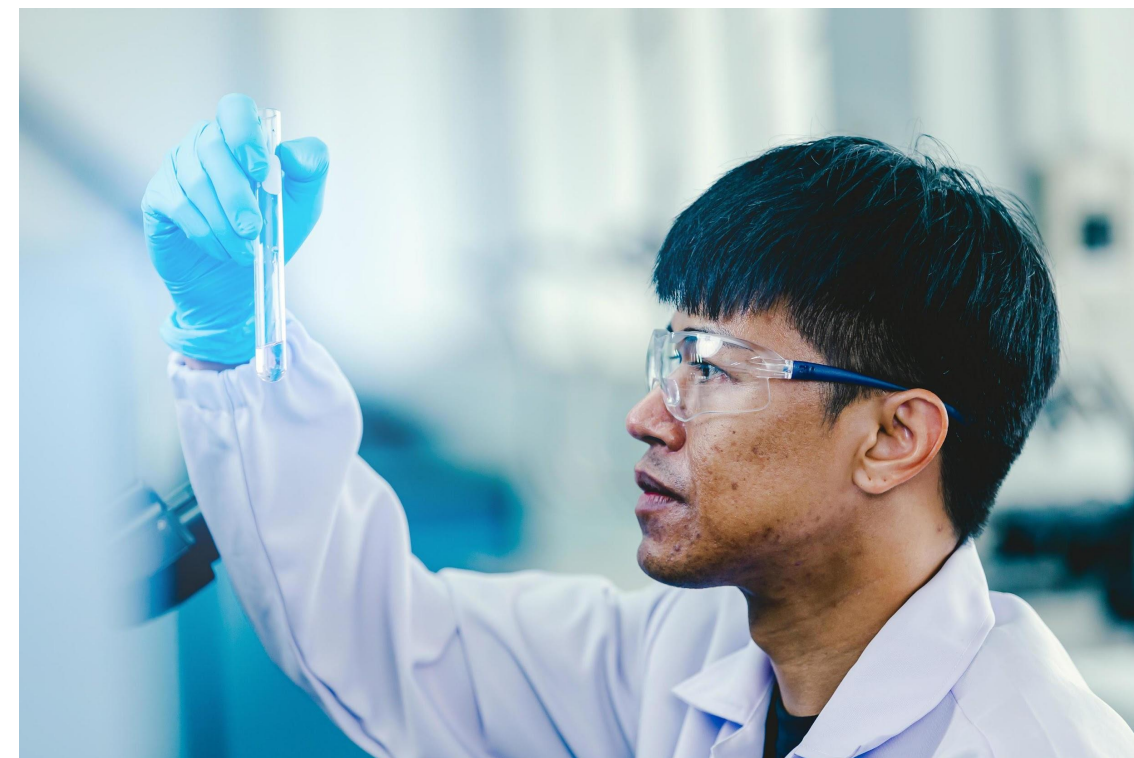
June 26, 2023

**Download from AEA Document
Library (aeanj.org)**

Analyzing for PFAS



- Until recently, there was no approved analytical method for wastewater (only potable water).
 - NJDEP has certified labs to use modified Method 533 and 537 for non-potable water.
 - In September 2021, EPA proposed a test method for PFAS (Draft Method 1663).
 - NJDEP has now certified labs for Draft Method 1633 in non-potable water (~\$400/sample)



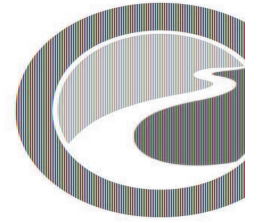
WWTP Evaluations



- Sampling influent, effluent, and sludge to know whether it is present.
- Sampling industrial users. If it is present, working in partnership with IUs to track down sources.
 - Is PFAS coming from industrial, commercial, or residential users?
- Bringing PFAS concentrations down before NUDER edicts



What has sampling shown?



- Streams
 - Concentrations of PFOA and PFOS sometimes approach current drinking water MCLs
 - Rural streams sometimes have higher PFAS than urban streams
- Wastewater
 - PFOA concentrations sometimes near or exceed drinking water MCL but often no higher than streams
 - Residential wastewater and industrial wastewater are often not very different.
- Landfills
 - High concentrations sometimes observed in leachate



The Future



- Adoption of lower EPA PFAS Drinking Water Criteria (4 ppt)
- Adoption of NJ PFAS surface water quality criteria (13 -14 ppt)

Conclusions



- Proposed EPA MCLs will require a transformation on how we address PFAS
 - Concentrations in groundwater and surface water will often exceed MCLs
- Future NJ PFAS Surface Water Quality Criteria
 - Will encourage WWTPs to track down sources
 - May lead to WWTP effluent limits
- PFAS is in the news daily... there will be much to follow in the coming years.



Questions / Discussion



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Thank You!

Stay Involved!

Jersey Water Works



www.jerseywaterworks.org