

**EXVIC** Engineering and Expeditionary Warfare Center

# Strategies to Address Per- and Polyfluoroalkyl Substances (PFAS) in Private Drinking Water Wells near Naval Installations

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#### Information in this presentation is current as of May 30, 2025.

EXWC: Engineering and Expeditionary Warfare Center NAVFAC: Naval Facilities Engineering Systems Command

## **Speaker Introduction**



### Paul Landin, P.E. NAVFAC Atlantic



- Supervisory Environmental Engineer (VA)
- Branch Head of Restoration Engineering and Sciences at NAVFAC Atlantic
- SME for off-base drinking water projects
- Workgroups
  - Emerging Contaminants
  - Radiological

### **Presentation Overview**

### Introduction

- Background
- PFAS Policy and Regulation
- History of Navy's Private Drinking Water Well Sampling
- 3 September 2024 DoD Policy Impacts
- 3 September 2024 DoD Policy Response Options
- Planning for Private Drinking Water Well Sampling
- Case Study and Lessons Learned
- Summary and Closing Statements

DoD: Department of Defense





### Introduction

- The DON identified PFAS as an emerging contaminant as early as 2014
- The most likely exposure pathway is through groundwater, which could impact on-base and off-base drinking water wells
- Sampling PFAS in private drinking water wells provides the data needed to allow the Navy to take action to eliminate exposure
- Need to identify appropriate solutions to address exposure
  - Follow DoD and Navy policies and guidance
  - Determine whether private drinking water wells may be impacted
  - Evaluate technologies and approaches for enduring solutions

DoN: Department of the Navy PFAS: per- and polyfluoroalkyl substances

Introduction

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### • EPA

• What is a health advisory?

Background

- Issued for chemicals not subject to a National Primary Drinking Water Regulation
- Identifies concentration at which adverse effects are NOT anticipated to occur
- Subject to change as science evolves
- Not legally enforceable
- Interim or provisional health advisory
  - Developed in response to an urgent situation
  - Considers health-based hazard concentrations
  - Can be updated or removed

EPA: United States Environmental Protection Agency

Background

# Background



### • EPA

- What is an MCL?
  - Highest level of a contaminant allowed in drinking water
  - Enforceable drinking water standard
  - Applicable to public water systems

- "The National Primary Drinking Water Regulations (NPDWR) are <u>legally enforceable</u> primary standards and treatment techniques that apply to <u>public water systems</u>. Primary standards and treatment techniques protect public health by limiting the levels of <u>contaminants in drinking water</u>." (EPA 2025)
- April 24, 2024 EPA published a final NPDWR establishing nationwide drinking water standards for public drinking water systems for <u>certain PFAS</u> under the Safe Drinking Water Act
- Operators of public drinking water systems regulated by the NPDWR have until April 26, 2029 to meet these standards
- In May 2025, EPA announced plans to adjust some aspects of this rule. <u>If EPA updates the applicable requirements,</u> <u>DoD will update its policy as appropriate</u>

MCL: maximum contaminant level

Background





### Timeline of EPA PFAS Advisories and Regulatory Levels



- PFOA: perfluorooctanoic acid
- PFOS: perfluorooctane sulfonic acid

ppt: part(s) per trillion

Background

#### Strategies to Address PFAS in Private Drinking Water Wells near Naval Installations 9

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- Introduction
- Background
- PFAS Policy and Regulation
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- 3 September 2024 DoD Policy Impacts
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# **PFAS Policy and Regulation – Navy**



- June 20, 2016, policy memorandum (Navy 2016): Perfluorinated Compounds/Perfluoroalkyl Substances (PFC/PFAS) – Identification of Potential Areas of Concern (AOCs)
  - Developed process to inventory, validate, and prioritize areas where PFAS were or may have been released
    - Provided preliminary list of installations based on desktop review
    - Directed Navy and U.S. Marine Corps to identify all releases at all installations
  - Does not document or authorize use of 70 ppt



AOC: area of concern

# **PFAS Policy and Regulation – Navy**





- Enclosures
  - Flowchart outlining process to identify PFAS AOIs
  - Preliminary list of PFAS AOIs per installation (not an inclusive installation/AOI list)
  - List of potential PFAS release mechanisms
- Flowchart includes steps for evaluation of off-Base drinking water

AOI: area of interest DERP: Defense Environmental Restoration Program ERP: Environmental Restoration Program NFA: No Further Action



PFAS Policy and Regulation

# **PFAS Policy and Regulation – DoD**



- December 22, 2021, technical guidance memorandum (DoD 2021): Department of Defense Guidance on Using State Per- and Polyfluoroalkyl Substances Drinking Water Standards in Comprehensive Environmental Response, Compensation, and Liability Act Removal Actions
  - Clarifies
    - When a removal action can be conducted for PFAS under CERCLA
    - How promulgated state PFAS standards can be used in removal actions
  - For groundwater used as drinking water, removal actions
    - May be conducted where DoD is responsible for a confirmed release with PFOS/PFOA concentrations above 70 ppt in private drinking water wells
    - May be extended to drinking water wells when site-specific hydrogeological conditions are expected to result in PFOS/PFOA above 70 ppt without a removal action
    - "...once initiation of a removal action is triggered as set out above, and DoD as the lead agency identifies a properly
      promulgated, consistently implemented State PFAS drinking water standard as an ARAR for the specific removal action,
      DoD may use the State PFAS drinking water standard when determining the cleanup level to be attained at the completion
      of the removal action." (DoD 2021)

ARAR: Applicable or Relevant and Appropriate Requirement

CERCLA: Comprehensive Environmental Response, Compensation, and Liability Act

PFAS Policy and Regulation

#### Strategies to Address PFAS in Private Drinking Water Wells near Naval Installations 13



# **PFAS Policy and Regulation – DoD**



- 3 September 2024 DoD Policy: *Prioritization of Department of Defense Cleanup Actions to Implement the Federal Drinking Water Standards for Per- and Polyfluoroalkyl Substances under the Defense Environmental Restoration Program* 
  - Authorizes interim actions to address private drinking water wells impacted by PFAS from DoD activities at or above these levels
    - These are not final remedy values, which will consider MCLs and background
  - Focuses on implementing enduring solutions

PFAS	Level
perfluorooctanoic acid (PFOA)	12 ppt
perfluorooctane sulfonic acid (PFOS)	12 ppt
perfluorononanoic acid (PFNA)	30 ppt
perfluorohexane sulfonic acid (PFHxS)	30 ppt
hexafluoropropylene oxide dimer acid (HFPO-DA, or GenX)	30 ppt
hazard index for mixture of at least two of PFHxS, PFNA, HFPO-DA, and perfluorobutane sulfonic acid (PFBS)	3 (no units)

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- 2014: Former NAWC Warminster, Former NAS JRB Willow Grove
- 2015 to 2016: NALF Fentress
- 2015 to 2016: NWS Earle
- 2016: Prioritization



DWS: drinking water system JRB: Joint Reserve Base NALF: Naval Auxiliary Landing Field NAS: Naval Air Station NAWC: Naval Air Warfare Center NWS: Naval Weapons Station

History of Navy's Private Drinking Water Well Sampling



### **Priority 1 Installations**

- NRL-CBD (MD)
- NAS Whidbey Island\* (WA)
- OLF Coupeville (NAS Whidbey Island)\* (WA)
- NARL Barrow\* (AK)
- MCOLF Atlantic (MCAS Cherry Point)\* (NC)
- NWS Crane (IN)
- Former NWIRP Calverton (NY)
- NWS Earle\* (NJ)
- NAS Oceana (VA)
- NALF Fentress (NAS Oceana)\* (VA)

MCAS: Marine Corps Air Station MCOLF: Marine Corps Outlying Landing Field MCLB: Marine Corps Logistics Base NRL-CBD: Naval Research Laboratory – Chesapeake Bay Detachment

History of Navy's Private Drinking Water Well Sampling

- NCBC Gulfport (MS)
- NAS Jacksonville (FL)
- OLF Whitehouse (NAS Jacksonville) (FL)
- NS Mayport (FL)
- NAS Pensacola (FL)
- Saufley Field (NAS Pensacola)\* (FL)
- NAS Whiting Field\* (FL)
- NAS Meridian (MS)
- Point Mugu (CA)
- NAS Fallon (CA)
- MCLB Barstow\* (CA)

NARL: Naval Arctic Research Laboratory NCBC: Naval Construction Battalion Center NS: Naval Station NWIRP: Naval Weapons Industrial Reserve Plant OLF: Outlying Landing Field

\*PFOA and/or PFOS above 70 ppt

Strategies to Address PFAS in Private Drinking Water Wells near Naval Installations 17



- Designation of sampling areas
  - 2016 policy does NOT require analytical data to confirm release to groundwater
  - Conservative approach to account for uncertainty
  - 1 mile downgradient from installation boundary or release area
  - Step out areas
    - Early days: 0.5-mile step out from property with exceedance of 70 ppt
    - More recent: 0.5-mile step out considered along with conceptual site model and drinking water well location information
- With SIs complete and RIs underway, sampling areas may be further refined



RI: Remedial Investigation

SI: Site Inspection

History of Navy's Private Drinking Water Well Sampling Strategies to Address PFAS in Private Drinking Water Wells near Naval Installations 18



- OLF Evergreen (AL)
  - Suspected PFAS release (crash shack and runways)
  - Groundwater flow assumed to be radial
  - 1 mile from installation boundary



History of Navy's Private Drinking Water Well Sampling Strategies to Address PFAS in Private Drinking Water Wells near Naval Installations 19



- MCOLF Atlantic (NC)
  - Suspected PFAS release (runways)
  - Groundwater flow assumed to be radial
  - 1 mile from release area (airfield)



(NAVFAC Atlantic 2017)



- NWS Earle (NJ)
  - Site 46, Fire Training School
    - PFOA/PFOS detected in groundwater above 70 ppt
    - Groundwater flow from Site 46 to the southeast
    - 0.5 mile from release area
  - During SI
    - Confirmed additional release areas
    - Refined groundwater flow
    - Additional sampling area identified
    - Area downgradient of Site 46 expanded

(NAVFAC Mid-Atlantic 2015)



History of Navy's Private Drinking Water Well Sampling

Strategies to Address PFAS in Private Drinking Water Wells near Naval Installations 21

- NAS Whiting Field (FL)
  - Priority 1 sampling area downgradient of Site 18 (Fire Training Area)
  - Additional PFAS release areas identified during PA
  - Additional sampling areas identified
  - Multiple stepout areas due to exceedances in private drinking water wells





PA: Preliminary Assessment

(NAVFAC Atlantic 2017)

History of Navy's Private Drinking Water Well Sampling Strategies to A

Strategies to Address PFAS in Private Drinking Water Wells near Naval Installations 22





### Analytical requirements

- Early days
  - PFOA, PFOS, PFBS reported
  - High reporting limits
- Progression of analyte list
  - 537.1 14 analytes, then 18
  - 537.1 and 533 29 analytes (to align with) UCMR5

METHOD 537.1 DETERMINATION OF SELECTED PER- AND POLYFLUORINATED ALKYL SUBSTANCES IN DRINKING WATER BY SOLID PHASE EXTRACTION AND LIQUID CHROMATOGRAPHY/TANDEM MASS SPECTROMETRY (LC/MS/MS)

METHOD 533: DETERMINATION OF PER- AND POLYFLUOROALKYL SUBSTANCES IN DRINKING WATER BY ISOTOPE DILUTION ANION EXCHANGE SOLID PHASE EXTRACTION AND LIQUID CHROMATOGRAPHY/TANDEM MASS SPECTROMETRY

(EPA 2020)

UCMR5 : Unregulated Contaminant Monitoring Rule 5



### Fall 2016 through Spring 2024

- More than 60 installations (active and BRAC) with private drinking water well sampling
- Number of wells sampled per installation ranges from <5 to >500



Navy Off-Base Private Drinking Water Well Sampling

BRAC: Base Realignment and Closure

History of Navy's Private Drinking Water Well Sampling Strategies to Address PFAS

Strategies to Address PFAS in Private Drinking Water Wells near Naval Installations 24

### **Presentation Overview**

- Introduction
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- PFAS Policy and Regulation
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#### **DoD Policy Impacts**

# **DoD Policy Impacts**

- 3 September 2024 DoD Policy: Prioritization of Department of Defense Cleanup Actions to Implement the Federal Drinking Water Standards for Per- and Polyfluoroalkyl Substances Under the Defense Environmental Restoration Program
- Summary
  - EPA announced MCLs for several PFAS
    - Effective June 2024
    - Applies to public drinking water systems





#### **DoD Policy Impacts**

# **DoD Policy Impacts**

- 3 September 2024 DoD Policy Summary
  - Interim Action options in prioritized order
    - At or above DoD PFAS Interim Action Levels for private drinking water wells
      - Connection to public water systems
      - Installation of whole house treatment systems
      - Provision of point of use treatment systems
      - Provision for bottled water
        - Allowed when other options technically infeasible (requires waiver)
        - PFOS/PFOA above 70 ppt (individually or combined)
        - Bottled water already being provided prior to DoD policy and at or above DoD levels
  - Allows for prioritized response for highest levels of PFAS in private drinking water wells
  - Considers ubiquitous nature of PFAS and potential background concentrations
  - DoD Components will address drinking water down to MCLs or background for remedial actions utilizing the CERCLA process





# **DoD Policy Impacts**

- Re-evaluation of data
  - On-Base groundwater
  - Private drinking water wells
- Resampling
- Revised (expanded) sampling areas
- Additional interim actions
  - Based on available data
  - Resulting from new sampling or resampling

**KEY POINT** 

**Re-evaluation of the sampling area(s)** is required as new data is obtained or as the screening values change.







**DoD Policy Impacts** 

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# **DoD Policy Response Options**



- Enduring solutions in prioritization memorandum (DoD 2024)
  - Connection to public water
  - Treatment system installation
    - POET
    - POU
  - New well installation\*
  - Bottled water\*\*

\*Not listed in policy, still a viable option, especially where there is no public water supply \*\*Limited applicability POET: point-of-entry treatment POU: point-of-use



(DoD 2024)

**DoD Response Options** 

Strategies to Address PFAS in Private Drinking Water Wells near Naval Installations 30

#### Strategies to Address PFAS in Private Drinking Water Wells near Naval Installations 31

### **Connection to Public Water**

- Preferred option as enduring solution where feasible
- Eliminates exposure pathway and long-term liability
- December 2021 technical guidance document can be used to justify connection of other properties
- Timeframe to complete may be a few weeks to many years





# **Connection to Public Water**



- Lateral connections from existing lines simplest
- Larger expansions to unserved areas more complicated
  - May require city council approval
  - Design challenges may arise due to pressure concerns and age of piping
  - Likely require new meter and may require new hydrant(s)
  - Consider potential future requirements when planning large designs to avoid rework
- Property owner will receive water bill from public water purveyor
- Grants may be available to aid with connections



<sup>(</sup>NAVFAC Southeast 2023)



# **Treatment System Options**



### POET

- Treats all water coming from well to building including water for sanitation
- Typically requires a larger area for installation
  - May require a shed
- Can be designed for longer treatment times or less frequent changeout



Point of Entry

#### POU

- Treats water from a single point where water for drinking and cooking is sourced, such as a kitchen sink
- Can usually be installed under sink or on faucet or countertop
- May require validation testing
- Requires periodic filter replacement



# **Treatment System Comparison**



### POET

- May be long-term interim solution until connected to public water
- May be long-term final solution
- May need to consider:
  - Local/regional water quality for additional treatment/polishing
  - Geographically-specific conditions
    - Freeze protection
    - Storm protection
    - Wildlife
- Many U.S. private wells already have treatment systems for pH, iron, arsenic, manganese, etc., and existing systems may be upgraded to treat PFAS if feasible

### POU

- May be short-term interim solution until connected to public water or POET system installed
- Not recommended for long-term final solution
- Many commercially available options with varying degrees of removal efficiency
- May be limitations on capacity and/or treatment volume
- Systems should be selected for ease of maintainability by the resident

### **Treatment Types: Granular Activated Carbon**



- System construction with one or more GAC-filled vessels typically in series
- GAC adsorbs PFAS as water flows through vessels
- Not all granular activated carbons are same
  - Coal or coconut sourced
  - Performance may be different for long- and short-chain PFAS
- Typical design for empty bed contact time of 10 minutes
- Include sample ports upstream, between (if more than one), and downstream of vessels
- Sediment filtration and UV disinfection may improve system performance (through pre-treatment of sediment, which can fill pore space in filter media, and through reducing bacterial concerns downstream of filtration)
- Can be reactivated or reused in some cases
- Can be installed as POET or POU
- May be combined with other treatment (e.g., ion exchange resin)

GAC: granular activated carbon UV: ultraviolet

**DoD Response Options** 



(NAVFAC Mid-Atlantic 2018)

Strategies to Address PFAS in Private Drinking Water Wells near Naval Installations 35

(iStock 2021)

### **Treatment Types: Granular Activated Carbon**







(NAVFAC Mid-Atlantic 2018)

**DoD Response Options** 

Strategies to Address PFAS in Private Drinking Water Wells near Naval Installations 36

# **Treatment Types: Ion Exchange**



- System construction with two or more resin-filled vessels in series
- Resin has non-toxic ions that are swapped for PFAS as water flows through vessels
- IX resins are chemical or chemical-type specific
  - Numerous options tailored to treat PFAS
- Typical design for empty bed contact time of 3 to 5 minutes
- Include sample ports upstream, between (if more than one vessel), and downstream of vessels
- Sediment filtration and UV disinfection may improve system performance
- Can sometimes be regenerated or reused
- Can be installed as POET or POU
- May be combined with other treatment (e.g., GAC)



IX: ion exchange

**DoD Response Options** 

Strategies to Address PFAS in Private Drinking Water Wells near Naval Installations 37

(iStock 2021)

# **Treatment Types: Ion Exchange**

Example schematic of treatment system using ion exchange



PFCAs: perfluoroalkyl carboxylic acids

**DoD Response Options** 

#### Strategies to Address PFAS in Private Drinking Water Wells near Naval Installations 38

# **Treatment Types: Reverse Osmosis**

- System construction with one or more membranes
- Water and small substances (e.g., dissolved gases) can pass through membranes, leaving larger substances like PFAS on upstream side
- Loss of water pressure always occurs across membrane(s)
  - Need for a pressure tank downstream of membranes to maintain water pressure
- Include sample ports upstream and downstream
- Treatment may require remineralization to bring pH to levels suitable for drinking
- Sediment filtration and water softening often needed to prevent membrane damage
- These are included within a self-contained system all of the above in one unit
- Installed as POU



(Modified from iStock 2025)

# **Other Treatment System Options**



- There are other potentially commercially-available options to remove PFAS from drinking water
- Most lack
  - Evidence of ability to meet low ppt levels
  - National Sanitation Foundation certification
- Contact subject matter expert if there is stakeholder interest in implementing other options

#### **DoD Response Options**

#### Strategies to Address PFAS in Private Drinking Water Wells near Naval Installations 41

### Installation of New Well

- Install well in deeper, confined aquifer not currently impacted (and not likely in the future to be impacted) by PFAS
- Must be double-cased, with outer casing grouted into competent confining unit
- Test well prior to use
- Existing well must be removed from use and abandoned
- May not be optimal in all settings due to
  - Lack of continuous, competent confining unit
  - Presence of brackish conditions or other water quality issues at deeper intervals
  - Poor yield at deeper intervals
  - Presence of other non-PFAS chemicals in exceedance of MCLs





### **Bottled Water**

- 3 September 2024 DoD MCL Implementation Memo indicates bottled water can only be provided when
  - More sustainable alternatives are technically infeasible
    - Must request a waiver from ODASN-EMR
      - No approved waivers as of February 2025
  - PFOS and PFOS concentrations, individually or combined, are above 70 ppt
  - Bottled water was already being provided and PFAS levels are at or above the DoD levels





(Jacobs)

**DoD Response Options** 

ODASN-EMR: Office of the Deputy Assistant Secretary of Defense for Environmental Management and Restoration



	Public Water Connection		GAC		IX		RO		New Well	
٠	Eliminates long-term liability	•	Can be implemented quickly	•	Can be implemented quickly	•	Can be implemented quickly	•	<ul> <li>Greatly reduces potential for exposure</li> <li>Minimal maintenance and monitoring needed</li> </ul>	
•	No long-term maintenance or monitoring	٠	Reliable treatment method for most PFAS	٠	Reliable treatment method for most PFAS	•	Extremely reliable for a wide range of PFAS	r •		<ul> <li>exposure</li> <li>Minimal maintenance and</li> </ul>
•	requirements . No waste management .	<ul> <li>Relation</li> <li>inexp</li> </ul>	Relatively inexpensive	•	Smaller vessel size than GAC possible					
		•	Minimal waste management	•	Minimal waste management					

## **Comparison of Interim Actions: Disadvantages**



Public Water Connection	GAC	IX	RO	New Well
<ul> <li>Can take time</li> <li>Potential planning and design challenges</li> <li>Homeowner may be hesitant to pay water bill</li> </ul>	<ul> <li>Larger vessel size than IX needed based on bed contact time</li> <li>Shorter breakthrough times for some PFAS versus others</li> <li>Potential microbial growth on filter media</li> <li>Requires maintenance and performance monitoring (Navy responsibility)</li> </ul>	<ul> <li>Shorter breakthrough times for some PFAS versus others</li> <li>UV disinfection recommended due to potential microbial growth on filter media</li> <li>Requires maintenance and performance monitoring (Navy responsibility)</li> </ul>	<ul> <li>Requires pre- treatment to prevent membrane damage</li> <li>Requires maintenance and performance monitoring (Navy responsibility)</li> </ul>	<ul> <li>Not always possible depending on the site conditions</li> </ul>

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## **Planning for Private Drinking Water Well Sampling**



- Identify off-Base sampling area/finalize sampling area figure
- Quantify properties and suspected or confirmed wells within sampling area (include public supply sources such as wells and reservoirs)
- Identify interim action options
- 3 to 4 months before open house
  - Prepare outreach work plan, which provides
    - Overview of the process
    - Task details
    - Project-specific information
    - Templates
  - Start weekly team calls
    - Local team
    - Navy Technical Experts
    - Navy Risk Communication Experts
    - Consultants



Once the need to sample is identified, the planning begins.

Planning for Private Drinking Water Well Sampling

Strategies to Address PFAS in Private Drinking Water Wells near Naval Installations 46

## **Planning for Private Drinking Water Well Sampling**



- Engage multi-agency team
  - Health support
  - Regulatory support
- 3 to 4 weeks before Open House
  - Team preparation session
    - Risk communication 101
    - Top line message generation
    - Team understanding of project
    - Individual poster review and message development
    - Station Assignments
    - Mock meeting
  - ODASN-EMR review and Congressional Delegation (CODEL) notification
  - Start notification and outreach
    - All properties in sampling area receive mailings (letters or postcards)
    - Newspaper advertisements
    - Press release
    - Social media
- Host Open House
- Begin private drinking water well sampling





- NAVFAC RPM (typically the lead)
- Consultant
- NAVFAC Atlantic
  - Provides historical context and lessons learned
  - Program consistency
- Navy and Marine Corps Force Health Protection Center ("The Force")
  - Prepares teams for public engagement by
    - Helping develop project messaging
    - Providing basic risk communication training and tools
  - Provides consistency

- Installation (Commanding Officer, Executive Officer, Environmental, Public Affairs, Community Liaison, Public Works Officer)
  - Part of local community, may be face of the project
- Partner agencies (EPA and state and local environmental/health agencies)
  - Support team as independent agency
  - Answers questions about health, federal and state policies, etc.

**RPM:** Remedial Project Manager

Planning for Private Drinking Water Well Sampling

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- Former NWIRP Calverton
  - Suffolk County, NY
  - Government-owned, contractor-operated
    - Leased to Northrup Grumman Corporation
    - Aircraft parts manufacturing
  - Non-NPL
  - Most of the property now owned by Town of Riverhead



(NAVFAC Mid-Atlantic 2024)





- Identified as a Priority 1 site in 2016
- 54 parcels in sampling area
- 24 suspected/confirmed private drinking water wells
- 16 private drinking water wells sampled
  - No detections of PFOA and/or PFOS above 70 ppt
  - No stepouts
  - Periodic monitoring conducted, no change in results





- Facility-wide SI completed
- RIs ongoing at multiple sites
- Data from SI and RIs
  - Confirmed PFAS releases
  - Refined understanding of groundwater flow
- Data were reevaluated using DoD PFAS interim action levels for private drinking water wells





- Sampling area expanded based on
  - Better understanding of groundwater flow
  - Detections at or above DoD PFAS interim action levels for private drinking water wells
  - Added
    - 120 parcels
    - 40 suspected or confirmed private drinking water wells
- Consultant identified treatment system and bottled water vendor to provide POU systems or bottled water before sampling



- Weekly planning meetings
   began in August 2024
- Preparation Session in December 2024
- Public meeting in January 2025
- Sampling began day after public meeting



## **Lessons Learned: Planning**

- Sampling area figure generation
  - Backbone of project
  - Consider
    - On-Base groundwater data
    - Private drinking water well data (if available)
      - Detection limits
      - Reported analyte list
  - Includes collection of parcel water source data
    - Public water supply
    - Private drinking water well information
      - May not be available
      - NEVER exact
    - Helpful to understand parcel development status
  - Likely to take many iterations to finalize sampling area
  - Work with The Force, NAVFAC Atlantic, RPM, and consultants to refine sampling area
  - Finalize before
    - Kickoff meeting with installation personnel
    - Preparation of any outreach materials



## **Lessons Learned: Planning**



- Open House venues
  - Convenient location, near sampling area if possible
  - Easily accessible
  - Ample parking
  - Other activities may be scheduled for same time
  - Know maximum capacity
  - Security

## **Lessons Learned: Planning**



- Ensure funding is available to start sampling
  - Potential for exposure initially identified in PA
  - If not identified in PA, prioritize drinking water source evaluation
- Include drinking water source evaluation in all documents and record path forward
  - SAPs may require separate objective
  - Private drinking water well sampling must be covered in separate SAP
- Remind consultants of unique requirements for PFAS sampling
- Be prepared for stepout sampling

SAP: Sampling and Analysis Plan



- Connection to public water
  - Engage consultant's utility engineers for design support
  - Distance to existing water lines and connection size
    - Fire hydrant installation
    - Multiple properties can be connected
    - December 2021 OSD technical guidance
      - Removal actions may be completed if property is hydrologically connected and detections in groundwater or drinking water at or above DoD levels
    - Taking drinking water wells offline may alter local groundwater flow due to changing pumping conditions
  - Administrative requirements
    - Right-of-entry agreements
    - Permitting
    - Easements
    - Account setup

OSD: Office of the Secretary of Defense



- Connection to public water (continued)
  - Contracting mechanisms for installing water lines
    - Directly with water provider
      - Waterline ownership
      - Navy has little control over schedule, consider funding expiration
    - Navy consultants
      - Ideal for TCRAs, hire a plumber
      - Water line easily accessible, near property
      - Laterals already in place or need to be installed
  - Engage NAVFAC Real Estate and Counsel

TCRA: Time-Critical Removal Action

- POET/POUs
  - May require validation testing
    - SAP required
    - Ensures treatment system is functioning
    - Conducted by consultant
    - Label and document sample ports
    - Once performance monitoring is validated, stop collecting samples
  - Maintenance
    - Should be conducted by treatment system vendor
    - Material changeout
    - Leaks
    - Catastrophic failures
  - Site-specific considerations
    - Space for treatment system
    - Plumbing upgrades
    - Climate

Case Study and Lessons Learned

Water quality









- Bottled water considerations
  - Number of people in household
  - 5-gallon containers with dispenser
  - Smaller containers, tabletop dispenser
  - Ice
  - Not for pets or farm animals
  - Provide property owner with bottled water vendor and Navy consultant contacts
  - Bottled water vendor must stick with contracted scope
    - No specialty waters
    - No other non-water items

### Documentation is required for action taken. Do not delay completing an

f Evaluatio

- Engineering Evaluation/Cost Analysis
  - Publish notice of availability
  - 30-day comment period
- AM once complete

- Non-TCRA
  - Planning period is more than 6 months

- Emergency Removal Action
  - Response within hours or days (immediate)
  - AM
    - Publish notice of availability within
       60 days of initiation

**KEY POINT** 

• 30-day comment period

TCRA

Planning is
6 months or less

**Lessons Learned: Documentation Requirements** 

- AM
  - Publish notice of availability within
     60 days of initiation

requirements. Ensure documentation is loaded into NIRIS.

• 30-day comment period

AM following completion of removal action to ensure compliance with

AM: Action Memorandum

Case Study and Lessons Learned

Strategies to Address PFAS in Private Drinking Water Wells near Naval Installations 62

### **Presentation Overview**

- Introduction
- Background
- PFAS Policy and Regulation
- History of Navy's Private Drinking Water Well Sampling
- 3 September 2024 DoD Policy Impacts
- 3 September 2024 DoD Policy Response Options
- Planning for Private Drinking Water Well Sampling
- Case Study and Lessons Learned
- Summary and Closing Statements

# **Summary and Closing Statements**



- Begin planning early!
- Communicate early and often with surrounding communities
- Important to assemble a knowledgeable team to help manage all aspects of addressing private drinking water





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# Questions