



Open Environmental Restoration Resource (OER2) Webinar

Department of the Navy (DON) NAVFAC Perfluorinated Compounds (PFCs) Guidance: Your Questions, Our Answers

Presented by:
DON NAVFAC Environmental Restoration
Program

Webinar #4

Points of Contact



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- Submit all questions via chat box throughout the presentation
- Presentation is being recorded
- Complete the webinar survey (main feedback mechanism)

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OER2 Webinar Series



- Why Attend?

- Obtain and hear about the latest DOD and DON's policies/guidance, tools, technologies and practices to improve the ERP's efficiency
- Promote innovation and share lessons learned
- **FEEDBACK** to the ERP Leadership

- Who Should Attend?

- ERP Community Members: RPMs, RTMs, Contractors, and other remediation practitioners who support and execute the ERP
- Voluntary participation

- Schedule and Registration:

- Every other month, 4th Wed (can be rescheduled due to holidays)
- Registration link for each topic (announced via ER T2 email)

- Topics and Presenters:

- **ERP community members** to submit topics (non-marketing and DON ERP-relevant) to POCs (Gunarti Coghlan – gunarti.coghlan@navy.mil or Josh Fortenberry – josh.fortenberry@navy.mil)
- Selected topic will be assigned Champion to work with presenter

Speaker Bio



- **Dave Barclift**

- **Biologist, NAVFAC Atlantic**

- **Previous Experience**

- NAVFAC Engineering Field Activity Northeast

- Remedial Technical Manager and Remedial Project Manager

- USGS Patuxent Wildlife Research Center

- EPA Region 3 Biological Technical Assistance Group

- **For 19 years, has provided technical support in the areas of risk assessment, environmental investigation/remediation, sediment investigation/remediation, and emerging contaminants.**



DON NAVFAC Perfluorinated Compounds (PFCs) Guidance: Your Questions, Our Answers

Dave Barclift, NAVFAC Atlantic

Presentation Outline



- PFCs – Basic Information
- DON NAVFAC PFC Guidance
 - Organization
 - Highlights
 - Frequently Asked Questions (FAQ) Section
 - Details on key FAQs
- Key Points
- Your questions...our answers!
- Wrap Up

- **DoD has identified certain PFCs as emerging contaminants (ECs)**
 - **PFCs have been used in a variety of industrial and military applications**
 - **Aqueous Film Forming Foam (AFFF)**
 - **PFCs are environmentally persistent**
 - **Studies have shown they have the potential to bioaccumulate in living organisms**
 - **Data is available that demonstrates toxicity in laboratory animals**

DON NAVFAC PFC FAQ Organization



- **FAQ Guidance was finalized on January 29, 2015!!**
- **Highlights Page**
- **Frequently Asked Questions**
 - **“G” FAQ – General/Definitions**
 - **“E” FAQ – Eligibility and Funding**
 - **“S” FAQ – Investigation and Sampling**
 - **“R” FAQ – Risk Assessment**
 - **“RR” FAQ – Remedial Response Considerations**
 - **“LUC” FAQ – Land Use Controls**
 - **“FY” FAQ – Five-Year Review Issues**

- **Highlight 1: Investigation of PFCs**

- **Consider investigating ER sites for PFCs when the conceptual site model (CSM) indicates:**

- Historical release or use of aqueous film forming foam (AFFF), or
 - Historical use of an area for other industrial activities (e.g., plating operations) that may have released PFCs

Naval Air Station + AFFF = PFOS/PFOA in Environment

• **Highlight 1: Investigation of PFCs (cont.)**

– **Potential sites include:**

- Runways and Flight-line Areas
- Hangars
- Plating Shops
- Sludge Disposal Areas
- Oil-Water Separators
- Crash Sites

– **Prioritize sites for sampling that likely had largest releases**

- Small, repeated quantities (e.g., fire training)
- Large, one-time quantity (e.g., crash site, hangar system discharge)
 - See FAQs G4, E2, S1, S2, S4, and S6

- **Highlight 2: Sampling and Analysis**

- Initially, PFC investigations should focus on **PFOS and PFOA**

- Sampling and analysis of additional PFCs may be included in the future to facilitate remedial design or when additional toxicity information become available

- For additional information see FAQs S6 – S13

- Initially sample for PFOS/PFOA
 - Analyze for other PFCs when considering remedial design/optimization

- **Highlight 3: Human Health Risk Assessment**

- **There are Tier 3 noncancer toxicity values for PFOS and PFOA**

- Estimate risk-based screening levels (Tier 1A or 1B) or noncancer hazards (Tier 2)
 - If potentially unacceptable risks are identified, develop site-specific risk-based cleanup goals
 - Tier 2 noncancer toxicity value for perfluorobutane sulfonate (PFBS)

- **For additional information, see FAQs R1 – R3**

Yes, human health risk can be calculated for PFOS/PFOA (and PFBS), but there is some uncertainty associated with the toxicity values and thus the risk estimates.

•**Highlight 4: Response to Detections**

–**The response should be consistent with DoD EC Guidance (DoD 2008 and DoD 2009)**

- DoD 2008. DOD USD (AT&L) memo of 17 Sep 2008, Actions in Response to Releases of Emerging Contaminants
- DoD 2009. DOD USD (AT&L) INST 4715.18 of 11 Jun 2009, (Certified Current Through June 11, 2016) Emerging Contaminants (ECs)

–**Delineate nature and extent of contamination**

–**If there is no current or potential future exposure, then further action should be delayed until there is greater certainty regarding toxicity and/or remedial technologies**

- **Highlight 4: Response to Detections (cont.)**
 - Document extent of contamination in Base Master Plan or other documents
 - If there is exposure, interim response actions may be initiated (e.g., monitoring, controlling land use, controlling plume migration, providing drinking water)
 - For additional information, see FAQs RR1 – RR6

- Follow DoD EC guidance when PFCs are detected
- Delineate nature and extent, and determine if there is exposure

•**Highlight 5: Remedial Actions**

–Information regarding degradation and transformation pathways and effective remedial technologies is limited

–As such, it may only be possible to

- Prevent exposure by implementing Land Use Controls (LUCs) or
- Initiate interim remedies

–For additional information, see FAQs RR7, S12, S13, and LUC1

Thus far, only proven technology is groundwater extraction and treatment with granular activated carbon

DON NAVFAC PFC FAQ

"G" General/Definitions



- **G1. What are emerging contaminants (ECs)?**
- **G2. What are perfluorinated compounds (PFCs)?**
- **G3. Are PFCs naturally occurring?**
- **G4. What were PFCs used for?**



DON NAVFAC PFC FAQ

"E" Eligibility and Funding



- **E1. Are PFCs considered CERCLA contaminants?**
- **E2. Can ER,N or BRAC funding be used to investigate and, if necessary, remediate PFCs?**
- **E3. What if this site has achieved site closure (SC)?**
 - The conceptual site model (CSM) must be well understood and strongly suggest that PFCs have impacted media in areas where exposure can occur
 - Additional investigation should only be initiated after careful consideration, with adequate justification, and with concurrence from the respective ER Manager (for ER,N) or Base Closure Manager (for BRAC)



- **S1. Should I start analyzing for PFCs as part of the “full suite”?**

- **S2. Should we sample for these chemicals even if the regulators are not asking?**

- **S3. What should be expected regarding fate and transport of PFCs?**

- **S4. Is it reasonable to assume that PFCs will be present at my site?**

- **S5. If a release is suspected which media should be sampled?**

- **S2. Should we sample for these chemicals even if the regulators are not asking?**

- Yes, provided that the CSM is consistent with historical release of AFFF or PFCs



- **S6. Is there a recommendation on how to prioritize sites for PFC sampling?**
- **S7. Which PFCs should be included in the sampling plan?**
- **S8. Are there special sampling techniques for these chemicals?**
- **S9. What method should be used to analyze samples?**
- **S10. Are there DoD ELAP accredited laboratories that can perform PFC analysis?**

- **S6. Is there a recommendation on how to prioritize sites for PFC sampling?**
 - **Air Stations are candidate sites**
 - **In the absence of site-specific information, in general consider**
 - Former firefighting training areas (FTAs)
 - Crash sites
 - Hangars, runways and flight line areas
 - Other (e.g., plating shops, sludge disposal areas, oil-water separators in the vicinity of historical releases, etc.)

DON NAVFAC PFC FAQ

"S" Investigation and Sampling (cont.)



DON NAVFAC PFC FAQ

"S" Investigation and Sampling (cont.)





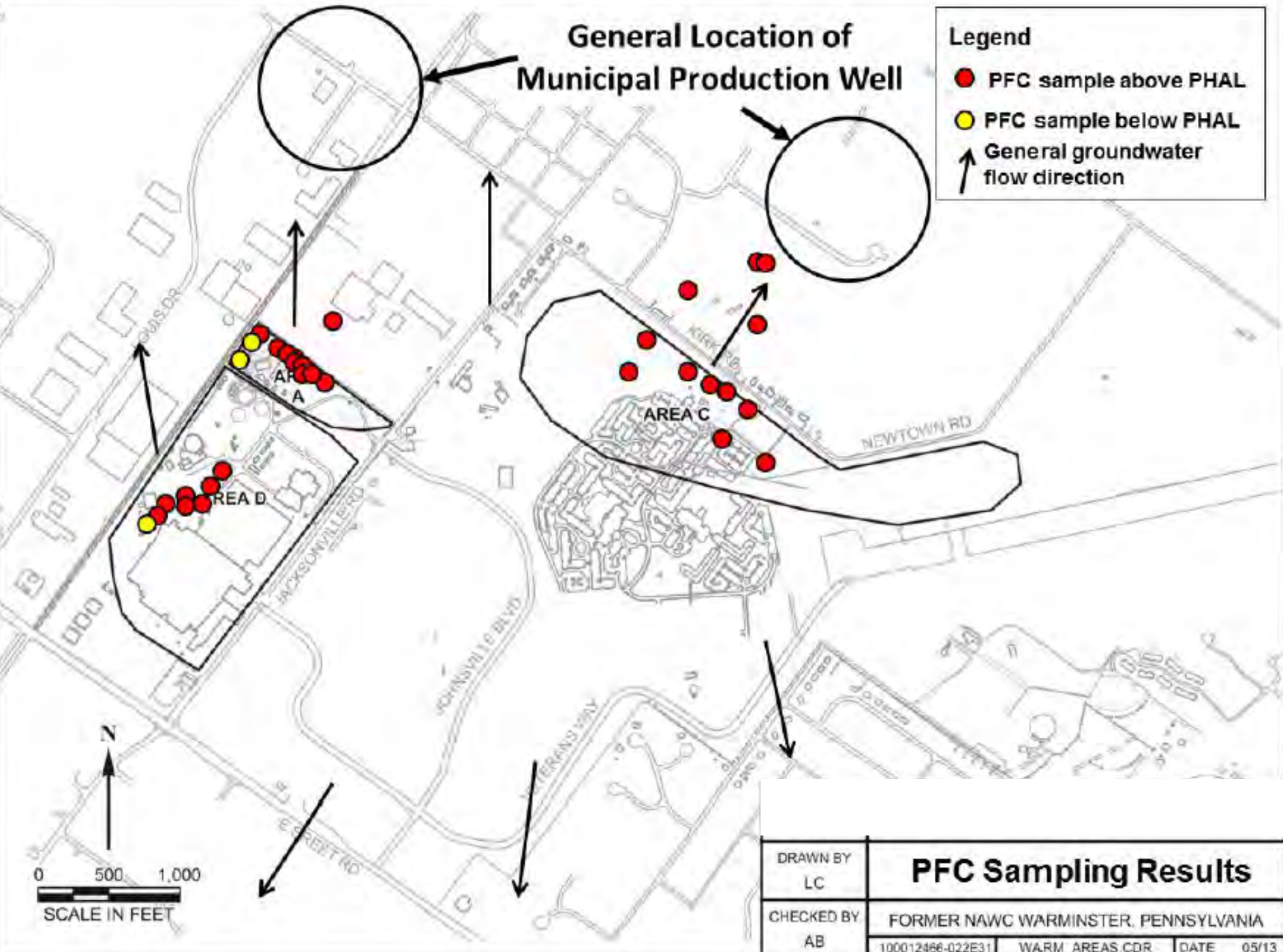
- **S11. What are the typical costs for PFC analysis?**
- **S12. What if a release is suspected to have migrated offsite?**
- **S13. What if drinking water supply wells could have been impacted?**

- **S12. What if a release is suspected to have migrated offsite?**
- **S13. What if drinking water supply wells could have been impacted?**
 - Potential drinking water wells in the area should be identified
 - Sampling offsite may need to be initiated and expedited
 - Notify your ER Manager/BCM, and NAVFAC HQ; coordinate with legal, real estate, and possibly the regulators as appropriate
 - Follow “Perfluorinated Compounds (PFCs) – An Emerging Environmental Issue” DON Policy Memo

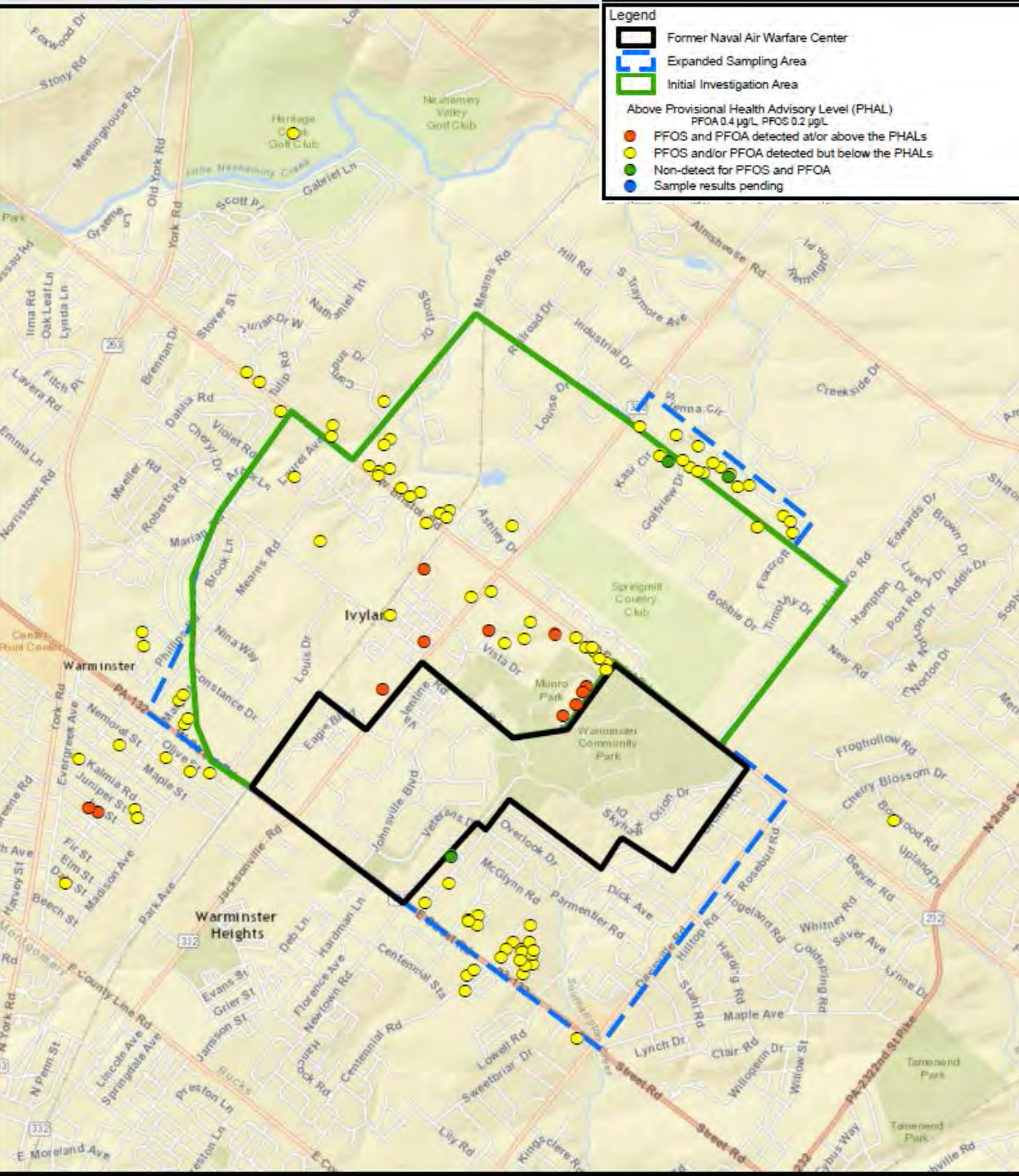
General Location of Municipal Production Well

Legend

- PFC sample above PHAL
- PFC sample below PHAL
- ↑ General groundwater flow direction



DRAWN BY LC	<h2>PFC Sampling Results</h2>			
CHECKED BY AB				
FORMER NAWC WARMINSTER, PENNSYLVANIA		100012466-022E31	WARM AREAS.CDR	DATE 05/13



Legend

- Former Naval Air Warfare Center
- Expanded Sampling Area
- Initial Investigation Area

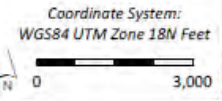
Above Provisional Health Advisory Level (PHAL)
 PFOA 0.4 µg/L, PFOS 0.2 µg/L

- PFOS and PFOA detected at/or above the PHALs
- PFOS and/or PFOA detected but below the PHALs
- Non-detect for PFOS and PFOA
- Sample results pending

Imagery: ESRI, GeoEye, Digital Globe 2013

Warminster, Bucks County, PA

PFC Sample Location Map



TDD#: WS01-14-06-001
 Contract: EP-53-10-05
 Prepared: 12/11/2014

Private Well Sampling Results

DON NAVFAC PFC FAQ

"R" Risk Assessment



- R1. Should PFCs automatically be included in the risk assessment?
- R2. What human health risk assessment screening levels are available?
- R3. What human health toxicity values are available?
- R4. What exposure pathways should be included in a human health risk assessment?
- R5. Do PFCs need to be considered in the ecological risk assessment?
- R6. What ecological risk assessment screening levels are available?

- R2. What human health risk assessment screening levels are available?

	Soil (mg/kg)		Groundwater (µg/L)
	Residential	Industrial	
PFOA	12	165	4.0
PFOS	4.9	66	1.6
PFBS	1,230	16,500	383

Note: Calculated using EPA's Online RSL Calculator, December 2014. Always confirm with a risk assessor that the most current screening values are being used.



- **RR1. If sampling indicates presence of PFCs, is response warranted?**
- **RR2. How should cleanup levels be established for PFCs?**
- **RR3. If PFCs are the only risk driver, does it drive a CERCLA response?**
- **RR4. What if other contaminants are not present at levels requiring action and it is unclear that PFCs are present at levels that would warrant action?**
- **RR5. What if other contaminants are present at levels requiring action and it is unclear if PFCs are present at levels that would warrant action?**
- **RR6. What if other contaminants are present at levels requiring action and it is likely that PFCs are present at levels that would warrant action?**
- **RR7. What treatment technologies are available for PFCs?**

- **RR1. If sampling indicates presence of PFCs, is response warranted?**

- **Decision is based on a risk assessment**

- **If there is a potentially unacceptable risk, evaluate chemical-specific ARARs**

- EPA drinking water short-term provisional health advisories for PFOS/PFOA are not promulgated and thus are not federal ARARs
 - Consult with counsel if state ARARs are suggested



•FAQ – Land Use Controls

- LUC1. Should land use controls (LUCs) be considered when PFCs are present?

•FAQ - Five-Year Review Issues

- FY1. Should PFCs be considered during 5-Year Reviews?

•FY1. Should PFCs be considered during 5-Year Reviews?

–Yes, provided

- They were a contaminant of concern in accordance with the DON 5-year Review Policy (DON 2011), or
- They were not previously considered but the conceptual site model (CSM) indicates historical releases have occurred

•References

- DON 2014. DON ASN (EI&E) memo of 21 Oct 2014, Perfluorinated Compounds (PFCs) – An Emerging Environmental Issue
- DON. 2011. DON CNO memo of 7 JUN 2011 (5090 N453 Ser/11U158119). Policy for Conducting Five-Year Reviews

•References

- DoD 2008. DOD USD (AT&L) memo of 17 Sep 2008, Actions in Response to Releases of Emerging Contaminants
- DoD 2009. DOD USD (AT&L) INST 4715.18 of 11 Jun 2009, (Certified Current Through June 11, 2016) Emerging Contaminants (ECs)

Key Points



- **Knowledge of PFCs is continually evolving**
- **DON NAVFAC Guidance provides general approaches for most scenarios**
 - **If unsure, or new information is available, check with Navy representatives to ensure appropriate path forward**
- **If drinking water is potentially impacted, prioritize sampling and use available information to determine if action is warranted**

Your Questions.....Our Answers



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Wrap Up



- Please complete the feedback questionnaire at the end of this webinar. We are counting on your feedback to make this webinar series relevant!

- **Next OER2 Webinar Info....**

Managing the Navy's Complex Groundwater Sites: Alternatives Endpoints and Approaches

Presenters: Rula Deeb and Mike Singletary

Date: April 29th , 2015

Time: 11:00 PST

Thank you for participating!