

## Entries for March 16-31, 2025

### Market/Commercialization Information

#### NORTHWESTERN DIVISION REGIONAL \$245 MILLION PRE-PLACED REMEDIAL ACTION CONTRACT INDEFINITE DELIVERY / INDEFINITE QUANTITY MULTIPLE AWARD TASK ORDER CONTRACT (PRESOL)

U.S. Army Corps of Engineers (USACE), Northwest Division, Seattle District, Seattle, WA  
Contract Opportunities on SAM.gov W912DW25R0003, 2025

When this solicitation is released on or about early to mid June 2025, it will be competed as an 8(A) set-aside under NAICS code 562910. The USACE Seattle District anticipates solicitation and award of a Northwestern Division (NWD) Regional \$245 million Pre-placed Remedial Action Contract (PRAC) IDIQ Multiple Award Task Order with firm-fixed-price and cost-reimbursable task orders, or a combination of both. The PRAC may be used by Seattle, Portland, Walla Walla, Kansas City, and Omaha districts. In addition to the 14 NWD boundary states, this MATOC includes NY and NJ, which supports the mission of NWK. The Contractor(s) shall have the capability and experience to perform or provide a wide range of environmental remedial action services, which may include environmental removal actions, remedial actions, other remediation activities, and related activities necessary to ensure complete and successful remediation. See the solicitation for a list of remedial activities/technologies this PRAC may include. There is no solicitation at this time.

<https://sam.gov/opp/b65874b14f7f4ccc9577cf563f784fef/view>

#### ENVIRONMENTAL DREDGING SERVICES TO REMEDIATE CONTAMINATED SEDIMENT ASSOCIATED WITH THE CALLAHAN MINE SUPERFUND SITE IN BROOKSVILLE, MAINE (SOL)

U.S. Army Corps of Engineers (USACE), North Atlantic Engineer Division, New England District, Concord, MA  
Contract Opportunities on SAM.gov W912WJ25BA005, 2025

This is a full and open competition under NAICS code 562910. USACE requires Environmental Dredging Services to remediate contaminated sediment associated with the Callahan Mine Superfund Site. The work consists of dredging ~6,000 to 10,000 yd<sup>3</sup> of sediment from Goose Cove and covering an area of ~1.5 acres. The Goose Cove sediment removal area is located on the Penobscot Bay side of the former Goose Falls Dam with a tidal range of ~10 ft and a Mean Lower Low Water depth of ~4 to 6 feet. A maximum removal depth of 2-4 ft is required based on the requirements of the RoD and Remedial Design. Tidal surface elevations in this area will provide unimpeded barge access; however, mobilization to this area presents several challenges. Structures within the proposed sediment removal area such as a steel pipe, chains, and moorings, will be removed by the Contractor prior to dredging, and moorings will be replaced after remediation is complete. Goose Cove sediment removal can be completed using mechanical or hydraulic methods. Sediment removed from Goose Cove will be hydraulically pumped approximately 1,500 feet to a CAD cell (former mine pit) for tremie placement. Real-time hydrogen sulfide air monitoring will be required at the disposal location following an approved UFP-QAPP prepared by the Contractor. To protect against unintended releases of excessive sediment plumes, a turbidity curtain and turbidity monitoring may be required. An organized site visit has been scheduled for 10:00 AM EDT on Thursday, May 1, 2025. Offers are due by 1:00 PM EDT on May 19, 2025. <https://sam.gov/opp/2bb5b2bb7c424bd39bd757b72108d42e/view>

#### NAVFAC NORTHWEST LONG TERM MONITORING, OPERATIONS AND MAINTENANCE ENVIRONMENTAL REMEDIATION SERVICES (PRESOL)

U.S. Department of the Navy, Naval Facilities Engineering Systems Command, Pacific Command, Northwest Division, Silverdale, WA  
Contract Opportunities on SAM.gov N4425525R2002, 2025

When this solicitation is released, it will be competed as a total small business set-aside under NAICS code 562910. The U.S. Department of the Navy, Naval Facilities Engineering Systems Command, intends to award a Small Business Set-Aside, Firm-Fixed-Price Indefinite Delivery Indefinite Quantity contract to perform Environmental Services for Long Term Monitoring Operation and Maintenance (LTMO) in the NAVFAC Northwest area of responsibility (AOR), which includes Washington, Oregon, Idaho, Montana, Alaska, Iowa, Minnesota, North Dakota, South Dakota, Nebraska, and Wyoming. It is anticipated that most of the work will occur in Washington State, however, projects could be located anywhere in the NAVFAC Northwest AOR. The LTMO contract is to perform Environmental Services inclusive of environmental remediation services, environmental compliance services, technical consultation, long-term monitoring, and site operation maintenance services. There is no solicitation at this time. <https://sam.gov/opp/0171abd087bd434e824b9329fe9c8f61/view>

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## Cleanup News

#### OPTIMIZING NAPL REMEDIATION IN A COMPLEX, URBAN SETTING: SURFACTANT ENHANCED EXTRACTIONS AND IN-SITU CHEMICAL OXIDATIONS

Geckeler, G. I 34th Annual International Conference on Soil, Water, Energy, and Air, 17-20 March, San Diego, CA, abstract only, 2025

Remediation was optimized at a former manufactured gas plant site to enhance NAPL removal/destruction rates and meet long-term objectives in less than one year, so the site could be transferred for public use. DNAPL impacts, including PAHs, were present from ~15 to 40 ft bgs across 29,000 ft<sup>2</sup>. Extraction of free-phase DNAPL was accomplished through 34 dual-purpose extraction/injection wells. Surfactant-enhanced product recovery (SEPR) was conducted to increase mass extraction rates by injecting surfactant solutions at fixed wells and temporary DPT points. After diminishing mass extraction rates were achieved, ISCO injections were performed at over 210 locations to destroy residual, non-extractable PAH impacts. SEPR operations removed ~165,000 gals of DNAPL-surfactant-groundwater emulsion. Portions of the extraction system were dynamically operated to enhance ISCO distribution during several portions of the ISCO injection phase. This presentation highlights the interpretation and use of onsite data to optimize the performance of sequential SEPR and ISCO remedies.

See presentation from 2024 Chlorinated Conference: [https://xcdacademy.s3.amazonaws.com/battelle/2024\\_Chlorinated/D8\\_0800\\_715\\_Geckeler.pdf](https://xcdacademy.s3.amazonaws.com/battelle/2024_Chlorinated/D8_0800_715_Geckeler.pdf)

#### THERMAL DESORPTION OF 2,000 CUBIC YARDS OF PFAS-IMPACTED SOIL

Joyce, P. I 34th Annual International Conference on Soil, Water, Energy, and Air, 17-20 March, San Diego, CA, 33 slides, 2025

In 2024, EPA designated some PFAS compounds as hazardous substances, regulated under CERCLA. The environmental community has focused on reducing the exposure risks associated with PFAS-impacted groundwater, though most of the contaminant mass remains in the soil column. Excavation and offsite disposal is a potential solution, however, the costs can be prohibitive, and the hazardous substance owner retains liability. The pace of military construction activities, including building aircraft facilities, has increased substantially. As much of the soil is impacted with PFAS, the installations pile the soil, with volumes often exceeding 100,000 yd. The presentation includes:

- Lab results of thermal desorption showing varying degrees of efficacy between 250 and 400°C.
- Lessons learned from applying thermal desorption technologies at >400°C, achieving non-detect for targeted PFAS compounds.
- Extraction of vapors and onsite treatment using cooling, condensation, and GAC with controlled vapor emissions and discharge of treated water.
- Soil sampling and determination of PFAS concentrations before and after treatment.
- Scaling the process for larger applications, including soil piles, fire-training areas, and hybrid approaches.
- A sustainability perspective and initiatives to improve the process and lower the environmental footprint.

[https://s3.amazonaws.com/amz.xcdsystem.com/A51108D5-FA2F-2B6D-01D92AC0F42DCE3B\\_abstract\\_File25469/PresentationPDF\\_113\\_0313100026.pdf](https://s3.amazonaws.com/amz.xcdsystem.com/A51108D5-FA2F-2B6D-01D92AC0F42DCE3B_abstract_File25469/PresentationPDF_113_0313100026.pdf)

#### DESIGN AND INSTALLATION OF ELECTRICAL RESISTANCE HEATING SYSTEM USING HORIZONTAL DIRECTIONAL DRILLING

Lubrecht, M., T. Lackman, and D. Rountree. I 34th Annual International Conference on Soil, Water, Energy, and Air, 17-20 March, San Diego, CA, 21 slides, 2025

Tetrachloroethene detections above MCLs in private wells at the PCE Southeast site prompted EPA to designate it a Superfund site and allocate funds to remove contaminant sources in soil and address site-wide groundwater contamination. Electrical Resistance Heating (ERH) using ET-DSP™ technology was selected as the preferred remedy. The hybrid project design included the installation of 27 horizontal, 89 vertical, and 4 angled electrodes. Components in each assembly included power cables and water injection lines connected to each individual electrode. Additional installations included multiple vapor recovery wells, quench wells, and temperature sensors under the building to monitor temperatures and prevent vapor intrusion. Horizontal wells were installed with a compact directional drill rig. Despite the relatively large diameter of the electrodes, all assemblies were installed as single-ended. The electrode bores were backfilled with sand after the electrodes were installed to ensure conductivity with the surrounding formation. All bores were sealed with grout at their entry points. Horizontal directional drilling proved to be a viable method to install a complex ISTR system in an area that could not be accessed from above. The project required close coordination between the consultant, thermal contractor, and drilling contractor to ensure that all facets of the program were addressed. Remediation results are incorporated into the presentation.

[https://s3.amazonaws.com/amz.xcdsystem.com/A51108D5-FA2F-2B6D-01D92AC0F42DCE3B\\_abstract\\_File25469/PresentationPDF\\_104\\_0314123106.pdf](https://s3.amazonaws.com/amz.xcdsystem.com/A51108D5-FA2F-2B6D-01D92AC0F42DCE3B_abstract_File25469/PresentationPDF_104_0314123106.pdf)

#### LESSONS LEARNED FROM LOW-INTENSITY ELECTROCHEMICAL REMEDIATION OF CONTAMINANTS IN CLAY AND BEDROCK FRACTURES

Jin, S. I 34th Annual International Conference on Soil, Water, Energy, and Air, 17-20 March, San Diego, CA, 29 slides, 2025

This presentation describes lessons learned from field projects using E-Redox®, focusing on CVOCs. The case studies include sites that underwent combined remedies and sites with uncommon geochemical conditions. It objectively assesses E-Redox® technology as a tool for both conventional and challenging sites, especially those with tight lithology. It also aims to highlight the importance of pre-remediation site assessment and the option of combined remedial technologies to achieve cost-effective remediation and site closure.

[https://s3.amazonaws.com/amz.xcdsystem.com/A51108D5-FA2F-2B6D-01D92AC0F42DCE3B\\_abstract\\_File25469/PresentationPDF\\_139\\_0331103500.pdf](https://s3.amazonaws.com/amz.xcdsystem.com/A51108D5-FA2F-2B6D-01D92AC0F42DCE3B_abstract_File25469/PresentationPDF_139_0331103500.pdf)

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## Demonstrations / Feasibility Studies

## IN SITU TREATMENT-TRAIN REMEDIATION OF PER- AND POLYFLUOROALKYL SUBSTANCE-IMPACTED GROUNDWATER

Pourabadehei, M., D. Tarnocai, R. Timlin, R. Orquiza, C. McRae, and A. Tam. Remediation 35(2):e70014(2025)

An innovative In Situ Treatment-Train Permeable Reactive Barrier ("ISTT-PRB") was designed to provide a proof-of-concept test of using a PRB to intercept and remediate PFAS-impacted groundwater at the Canadian Forces Base Trenton in Ontario, Canada. Using permeable retaining walls between reactive cells allows separate treatment media replacement (modified bentonite clay and GAC) in any single cell, or chamber, if and when the media are spent and reach PFAS breakthrough. The pilot-scale ISTT-PRB successfully treated PFAS-impacted groundwater during nearly 2 years of operation, with up to 99.9% PFAS removal efficiency in lag (downstream) reactive cells. Lower PFAS removal efficiency was observed after heavy precipitation events or when the ground and PRB were fully saturated. Saturated ground conditions may have resulted in untreated groundwater bypassing the lead (upstream) reactive cells, adversely affecting the quality of treated groundwater in the lag reactive cells and PFAS removal efficiencies. Despite the saturated ground conditions during certain periods, removal efficiencies in lag reactive cells remained above ~94% in the second year of operation. Construction of a full-scale system in areas of higher hydraulic gradient and deeper water table may improve system performance. After nearly 2 years of operation, all three ISTT-PRB chambers (with 2.5%, 5.0%, and 7.5% mixing ratios of treatment media with PFAS-free fine sand) equally showed high PFAS removal efficiency. The ISTT-PRB pilot system may effectively intercept and treat PFAS-impacted groundwater for years without original treatment media replacement. When the treatment media are approaching fully adsorbed conditions, the performance of each chamber with different sorbent media mixing ratios can be reassessed to determine an optimized mixing ratio.

## ASSESSMENT OF TOXICITY POTENTIAL OF FREELY DISSOLVED PAHS USING PASSIVE SAMPLER IN KENTUCKY LAKE AND OHIO RIVER

Kim, N.Y., B.G. Loganathan, and G.B. Kim. Marine Pollution Bulletin 207:116833(2024)

Low-density polyethylene (LDPE) passive samplers were used to measure freely dissolved PAH concentrations ( $C_{free}$ ) in Kentucky Lake (KL) and Ohio River (OH). PAHs toxicity potential in sediment was assessed using equilibrium partitioning sediment benchmarks toxic units (ESBTUs) and the interstitial water toxic units (IWTUs) derived from OC-normalized concentration and  $C_{free}$ , respectively. The  $C_{free}$  in April and June were 127 and 97 times higher in OH than in KL, respectively. ESBTUs were also higher in both the KL and OH compared to the IWTUs, suggesting that ESBTUs overestimate the toxicity potential to organisms. Results indicate that passive samplers provide a reliable method for assessing the toxicity potential in sediments.

## PILOT TESTING A NEW AMENDMENT COMBINATION TO COMPLETE A COMPREHENSIVE REMEDIATION STRATEGY

Sheldon, J. 134th Annual International Conference on Soil, Water, Energy, and Air, 17-20 March, San Diego, CA, 23 slides, 2025

Following rapid site investigation and conceptual site model development, target areas were injected with an all-in-one chemical oxidant at a former oilfield manufacturing site impacted by chlorinated solvents to achieve a gross mass reduction of contaminants. In situ chemical reduction (ISCR) was chosen to complete remediation. After a 50% reduction of the chlorinated solvent mass post-oxidation, and allowing three months for subsurface conditions to return to background levels, a conceptual design was completed for ISCR, because site access would become limited and the monitoring well network would be reduced due to planned construction. A new compatible combination of amendments was chosen based on sorption, biodegradation, and abiotic reduction. The amendments included PlumeStop®, Aquifix™, Bio Dechlor Inoculum - BDI®, and S-MicroZVI®. Because the site plume is >150,000 ft<sup>2</sup>, the conceptual design focused on multiple injectable barrier rows arrayed perpendicular to the plume. A pilot test was completed as proof of concept using direct push injection of the amendment combination at an in-plume well. Monitoring of chlorinated compounds and geochemical parameters was conducted for 4 months post-injection. A 75% reduction in contaminant mass was observed in the pilot test area within the first few weeks after injection. The presentation shows the full pilot test results, including the design approach using a mass flux tool to target injection intervals. Lessons learned from challenges encountered, including artesian conditions, are also shared.

[https://s3.amazonaws.com/amz.xcdsystem.com/A51108D5-FA2F-2B6D-01D92AC0F42DCE3B\\_abstract\\_File25469/PresentationPDF\\_211\\_0314051545.pdf](https://s3.amazonaws.com/amz.xcdsystem.com/A51108D5-FA2F-2B6D-01D92AC0F42DCE3B_abstract_File25469/PresentationPDF_211_0314051545.pdf)

## FIELD DEMONSTRATION OF IN SITU REMEDIATION OF CONTAMINATED GROUNDWATER USING OZONE MICRO-NANO-BUBBLE-ENHANCED OXIDATION

Hu, L., Y. Cao, J. Sun, Z. Chen, M. Wang, Z. Wu, X. Zhu, L. Ji, and Q. Wen. Environmental Science & Technology 59(11):5829-5838(2025)

A field demonstration was conducted to investigate the efficiency of ozone micro-nano-bubble-enhanced oxidation (O<sub>3</sub>MNBEO) in remediating groundwater contaminated by various organic compounds. The O<sub>3</sub>MNBEO technology exhibited high removal efficiencies ranging from 85-100% for benzene and significantly reduced naphthalene, toluene, and petroleum hydrocarbon concentrations in five days. Groundwater remediation using the O<sub>3</sub>MNBEO technology required less energy consumption and CO<sub>2</sub> emissions. O<sub>3</sub>MNBEO had no significant effect on groundwater pH and conductivity. The oxidation-reduction potential (ORP) in groundwater and dissolved oxygen was substantially increased during the remediation process. The variations in ORP demonstrated a correlation with the contaminant concentration, which could serve as a potential indicator for assessing remediation progress. The presence of preferential seepage channels in the strata allows for the rapid migration of ozone micro-nano-bubbles (MNBs), extending the reach of ozone MNBs. The study demonstrated that O<sub>3</sub>MNBEO is an efficient, practical, and sustainable technology that can be applied to in situ remediation of contaminated groundwater.

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## Research

### TOOL AND DATABASE FOR ESTIMATING POTENTIAL LONGEVITY OF COLLOIDAL ACTIVATED CARBON BARRIERS FOR PFAS IN GROUNDWATER

Newell, C.J., W.B. Smith, K. Kearney, S. Clay, H. Javed, G.R. Carey, S.D. Richardson, and C.J. Werth. I Remediation 35(3):e70017(2025)

A planning-level graphical tool and a regression equation model are presented to estimate the longevity of colloidal activated carbon (CAC) barriers to treat PFAS in groundwater. Development of the tool incorporated information from field-scale CAC barriers, including design data from 17 sites and performance monitoring results from a total of 26 sites. The tool consists of graphical and mathematical frameworks for estimating barrier longevity based on site-specific parameters, including barrier dimensions, groundwater Darcy velocity, CAC loading, and influent PFAS concentrations. Application of the tool at 17 field sites yielded barrier longevity estimates ranging from 4 to >100,000 years, with median values of 870, 150, and 180 years for PFOS, PFOA, and PFHxS, respectively. The wide variation in longevity estimates is partly due to the significant variability in PFAS mass flux entering the barriers, as shown by the five-order-of-magnitude difference in PFOA mass flux, ranging from  $4 \times 10^{-5}$  to  $1 \times 10^{-3}$  kg/m<sup>2</sup>/year. The systematic decrease in barrier longevity from PFOS to PFOA/PFHxS aligns with known sorption behavior of these compounds onto CAC media. Key uncertainties in longevity estimation include spatial and temporal variability of PFAS and CAC, hydrogeologic heterogeneity, sorption isotherm selection, competitive sorption effects, and limited long-term performance data. The tool provides a standardized approach for preliminary barrier design using site-specific data while emphasizing the importance of applying appropriate safety factors and implementing long-term monitoring strategies.

<https://onlinelibrary.wiley.com/doi/epdf/10.1002/rem.70017>

### THE TOTAL MASS OF PER- AND POLYFLUOROALKYL SUBSTANCES (PFAS) IN CALIFORNIA COSMETICS

Balan, S.A., T.A. Bruton, K. Harris, L. Hayes, C.P. Leonetti, V.C. Mathrani, A.E. Noble, and D.S.C. Phelps. I Environmental Science & Technology 58(27):12101-12112(2024)

A methodology was developed to estimate the total PFAS mass in cosmetics as well as the corresponding mass of total organic fluorine and fluorinated side chains associated with PFAS precursors using various ingredient databases and ingredient concentrations reported by manufacturers. Results indicate that the cosmetics sold in California for one year cumulatively contain 650-56,000 kg of total PFAS, 370-37,000 kg of organic fluorine, and 330-20,000 kg of fluorinated side chains associated with PFAS precursors. Among the 16 product subcategories considered, >90% of the PFAS mass came from shaving creams and gels, hair care products, facial cleansers, sun care products, and lotions and moisturizers, while the sum of all nine makeup subcategories accounted for <https://pmc.ncbi.nlm.nih.gov/articles/PMC11238533/pdf/es3c06539.pdf>

### RESEARCH BRIEF 364: MACHINE LEARNING CREATES MORE COMPLETE PICTURE OF GROUNDWATER CONTAMINATION

National Institute of Environmental Health Sciences, Superfund Research Program, April 2025

SRP-funder researchers tested the ability of two algorithms to help scientists analyze co-occurring pollutants in groundwater by filling in missing field data points. The team tested the AMELIA and MICE machine learning algorithms, which are designed to predict missing data points and have previously been used to accurately generate large datasets. The algorithms were used separately to process incomplete groundwater sampling databases from Arizona and North Carolina. AMELIA and MICE each generated 10 predicted datasets for each state. Researchers tested the validity of the predicted data by calculating consistency across sets. They also compared the accuracy of the predicted data by comparing the similarities between the median values of the predicted and groundwater sampling data. Both AMELIA and MICE generated data were accurate to within a 5%-10% significance level. While the incomplete data showed that up to 80% of sampling locations had no pollutants or co-occurring pollutants above regulatory limits, the data from AMELIA and MICE predicted that only 15%-55% of locations had no level of pollutants above regulatory limits. The predicted data indicates that more locations have co-occurring pollutants than previously found in the sampling data. This suggests that groundwater remediation methods should focus on mixtures of pollutants.

[https://tools.niehs.nih.gov/srp/researchbriefs/view.cfm?Brief\\_ID=364&utm\\_medium=email&utm\\_source=govdelivery](https://tools.niehs.nih.gov/srp/researchbriefs/view.cfm?Brief_ID=364&utm_medium=email&utm_source=govdelivery)

### ESTIMATION OF EFFECTIVE FRACTURE APERTURE IN GLACIAL TILLS BY ANALYSIS OF DYE TRACER PENETRATION

Ouf, M., P.R. Jorgensen, K. Mosthaf, and M. Rolle. I Groundwater 63(1):25-40(2025)

A methodology to estimate effective apertures of fractures in glacial tills based on dye tracer infiltration tests and numerical simulations was advanced. The approach uses the visible penetration depth of the dye tracer along fracture flow paths as primary information to calculate effective fracture apertures as well as the dye tracer input concentration and retardation, the duration of the tracer injection, and the hydraulic gradient applied to control the infiltrating water fluxes. The method does not require measuring hydraulic conductivity for the fractured till and enables direct observation of flow and transport patterns within the fractures. The approach was successfully verified by using the estimated effective fracture aperture values in large undisturbed columns (LUCs) to simulate the observed LUC effluent breakthrough of a conservative bromide tracer and the water fluxes with the hydraulic gradient applied in the experiments. Sensitivity analyses revealed that estimation of small effective fracture apertures (<10 µm) required accurate determination of the dye tracer retardation factor. In the case of larger effective apertures (>20 µm), the sensitivity of the estimated effective fracture aperture to variations in the porous material and solute transport parameters was low compared to the dominant sensitivity to the water flow through the fractures (cubic relation between flow and aperture). The proposed approach may be extended beyond

laboratory applications and assist in characterizing field-scale fracture networks. <https://ngwa.onlinelibrary.wiley.com/doi/epdf/10.1111/qwat.13426>

#### **PERFLUOROALKYL SUBSTANCES (PFAS) IN GROUNDWATER AND SURFACE WATER IN THE TURIN METROPOLITAN AREA (ITALY): AN ATTEMPT TO UNRAVEL POTENTIAL POINT SOURCES AND COMPLIANCE WITH ENVIRONMENTAL/DRINKING WATER QUALITY STANDARDS**

Randazzo, A., F. Pavan, M. Gea, and A. Maffiotti.  
Science of The Total Environment 958:177973(2025)

A study investigated the contribution of five potential point source categories on the occurrence of 19 PFAS in freshwater from the Turin metropolitan area and assessed the quality of groundwater and surface water in compliance with European and Italian guidelines. PFAS were identified in 29 (24%) of the investigated shallow and deep wells with a total concentration, as a  $\Sigma$ PFAS of 0.01-0.71 and 0.01-0.16  $\mu\text{g/L}$ , respectively. PFAS occurrence in shallow groundwaters appeared more related to potentially contaminated and reclaimed areas, landfills and waste management plants rather than plants subjected to integrated environmental authorizations and wastewater treatment plants. PFAS occurrences increased with the degree of industrialization and urbanization in both unconfined and semi-confined aquifers. PFAS were found in 96% of the sampling sites in streams with  $\Sigma$ PFAS values of 0.0002-0.47  $\mu\text{g/L}$ , but were not found in the investigated lake. A slight correlation was found between wastewater treatment plants and the occurrence of PFAS in streams. The annual  $\Sigma$ PFAS loads downstream of the area were estimated at ~150-220 kg. Exceedances of the environmental and drinking water quality standards of Italy and Europe were detected.

#### **NOVEL METHOD TO DETERMINE BEDROCK FROM A SINGLE SENSOR BASED SEISMIC REFLECTION SIGNAL USING HAAR WAVELET TRANSFORM**

Ramesh, N.E. and S. Pushpa Mala. I Research 2:61(2024)

A study utilized continuous Haar wavelet local maxima lines to enhance 2D bedrock analysis. Seismic reflection data was acquired using an extremely sensitive geophone as a receiver along with a high dynamic-range data logger. The Common Midpoint approach, coupled with optimized offset distances, was utilized to ensure robust data quality and signal strength. Simple sources, such as a sledgehammer, generate sound waves for data collection prior to borehole drilling, correlating acquired data with lithogeological information. The study emphasized the significance of adjusting parameters like sampling frequency, choice of wavelet, and optimal offset distances. The methodology employed, involving a single geophone, a one-channel data recorder, and a sledgehammer, is an inexpensive, straightforward, and non-invasive approach. The study demonstrates the effectiveness of Haar wavelet local maxima lines in accurately determining bedrock depth, producing results closely aligned with both predicted and actual depths.

<https://link.springer.com/content/pdf/10.1007/s44288-024-00062-w.pdf>

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## **General News**

#### **THERMAL DESORPTION OF PER- AND POLYFLUOROALKYL SUBSTANCES (PFAS) FROM SOIL**

NAVFAC Fact Sheet, 4 pp, 2025

As evidence mounts that PFAS in source area soil can contribute to large, persistent groundwater plumes, treatment technologies to minimize the mass of PFAS in soil are needed. The results from two demonstration studies are included, detailing successful PFAS soil remediation using both ex situ and in situ thermal treatment as conducted under the Department of Defense (DoD) Environmental Security Technology Certification Program (ESTCP).

<https://www.clu-in.org/NAVFAC-Thermal-Desorption>

#### **ISSUES WITH APPLYING THE INCREMENTAL SAMPLING METHODOLOGY (ISM) TO PFAS INVESTIGATIONS**

DoD Environmental Data Quality Workgroup (EDQW) Memorandum, 4 pp, 2025

ISM is a sampling protocol that involves collecting and combining a large number of soil sample increments of equal depth and mass across an area defined as a decision unit (DU). The ISM protocol is designed so a single composite sample result represents the mean concentration of a chemical constituent in the DU. After further review and consideration, the DoD EDQW has recommended to avoid the use of ISM for PFAS sampling and analysis.

<https://www.clu-in.org/EDQW-Memo>

#### **A MINI-REVIEW OF FULL-SCALE DRINKING WATER TREATMENT PLANTS FOR PER- AND POLYFLUOROALKYL SUBSTANCES (PFAS) REMOVAL: POSSIBLE SOLUTIONS AND FUTURE DIRECTIONS**

Jafarnejad, S. I Sustainability 17(2):451(2025)

This article reviews EPA's PFAS water quality guidelines/regulations, remediation technologies for PFAS in water, and PFAS removal studies on full-scale drinking water treatment plants (DWTPs), discusses DWTP configurations for PFAS removal from source water, and suggests future direction. Further research on the effect of environmental factors on PFAS removal, the effective elimination of short-chain PFAS from real PFAS-contaminated source water using cost-effective and industrially applicable remediation technologies, the efficiency/performance of full-scale treatment trains including innovative advanced technologies in long-term for PFAS removal from source water to produce drinking water and the associated costs, as well as cost reduction/minimization via process optimization is still needed. *This article is Open Access at* <https://www.mdpi.com/2071-1050/17/2/451>

#### **UNDERSTANDING NANOSCALE INTERACTIONS BETWEEN MINERALS AND MICROBES: OPPORTUNITIES FOR GREEN REMEDIATION OF CONTAMINATED SITES**

Cao, T., Y. Liu, C. Gao, Y. Yuan, W. Chen, and T. Zhang.  
Environmental Science & Technology 58(32):14078-14087(2025)

This article describes new methodologies that exploit an array of multidisciplinary tools, including multiomics-based analysis, bioinformatics, machine learning, gene editing, real-time spectroscopic and microscopic analysis, and computational simulations, to identify key microbial drivers in real environments and characterize in situ the dynamic interplay between minerals and microbes with high spatiotemporal resolutions. It reflects on how the knowledge gained can be exploited to modulate the binding, electron transfer, and metabolic activities at the microbe-mineral interfaces and develop new in situ contaminant degradation and detoxication technologies with combined merits of high efficacy, material longevity, and low environmental impacts. Two main strategies are proposed to maximize the synergy between minerals and microbes, including using mineral nanoparticles to enhance the versatility of microorganisms and using microbes to synthesize and regenerate highly dispersed nanostructures with desired structural/surface properties and reactivity.

The Technology Innovation News Survey welcomes your comments and suggestions, as well as information about errors for correction. Please contact Michael Adam of the U.S. EPA Office of Superfund Remediation and Technology Innovation at [adam.michael@epa.gov](mailto:adam.michael@epa.gov) or (703) 603-9915 with any comments, suggestions, or corrections.

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