

Entries for September 1-15, 2026

Market/Commercialization Information

REQUEST FOR OFFER FOR RADMAC III PARCEL E REMEDIAL ACTION

U.S. Department of the Navy, NAVFAC Pacific Command, San Francisco, CA
Opportunities on SAM.gov N6247326RB009, 2026

This is a full and open competition under NAICS code 562910. The U.S. Department of the Navy's NAVFAC requires a contractor to implement the remaining portions of the Parcel E Phase 2 Remedial Action at Hunters Point Naval Shipyard in San Francisco, CA. The primary performance objectives of this PWS are to update the existing Remedial Action Work Plan and other plans, such as the Sampling and Analysis Plan, to describe the methods, procedures, and schedule for completing the work at IR-03: excavate the shoreline as needed to comply with remedial action objectives; construct shoreline protection features to protect the backfilled shoreline excavation for NAPL; implement in situ stabilization within the NAPL treatment footprint; and construct the groundwater containment slurry wall. Additional objectives include installing and sampling groundwater monitoring wells for four quarters; implementing and maintaining radiological controls in work areas; performing waste characterization and stockpiling waste for disposal or reuse, as appropriate; disposing of all non-radiological and radiological waste in accordance with Navy requirements and applicable laws and regulations; and coordinating low-level radioactive waste disposal with the Radiological Affairs Support Office. The contractor shall also complete a Remedial Action Completion Report summarizing the achievement of RAOs for NAPL at IR-03. As part of the Work Plan, the contractor shall propose a design change to exclude the top sand layer of the hybrid revetment because it is prone to erosion, obtain concurrence from the Navy and regulatory agencies, and implement the approved change. The contractor shall also coordinate with other contractors conducting work at the site. The period of performance will be 60 months from the award. Offers are due by 2:00 AM PST on November 3, 2026. <https://sam.gov/workspace/contract/opp/a58efdf185a245868ea48b12a6a6f065/view>

SBERS MATOC, USACE NORTHWESTERN DIVISION AND EPA REGION 2 (SOL)

U.S. Army Corps of Engineers, Northwestern Engineer Division, Kansas City District, Kansas City, MO
Opportunities on SAM.gov W912DQ26RA109, 2026

This is a total small business set-aside under NAICS code 562910. The U.S. Army Corps of Engineers, Northwestern Engineer Division, seeks a contractor to provide environmental remediation services. The Contractors selected for this work shall have the capability and experience to perform or provide a wide range of remedial action services at hazardous waste sites. These efforts may include, but are not limited to, environmental remedial actions, remedial actions, and other remediation activities as well as related activities necessary to complete a successful remediation, conduct long-term response actions, or long-term monitoring. Construction efforts necessary to implement environmental remediation services are included in the scope of work. Remedial activities may include dredging, excavation, transportation, and disposal of hazardous, toxic, or low level radiological waste; asbestos and lead based paint remediation; building remediation and demolition; construction and operation of groundwater treatment plants and extraction systems; installing and operating in situ treatment technologies including but not limited to air sparging, chemical oxidation, bioremediation, ground-water circulating wells, permeable reactive barriers, soil vapor extraction, and thermal treatment; water line installations/service connections hookups; and utility line replacement and/or remediation along utility lines; and erosion, sewer, and storm water controls for the purpose of compliance and/or pollution prevention. Supporting activities include but are not limited to: sampling and laboratory analysis of soil, groundwater, surface water, air, and sediments; preparing work plans, reports, studies, and ability to conduct studies to support RCRA, CERCLA and other programs listed above; public participation including the presentation of both written and visual material; data analysis/interpretation/modeling, and data management; special studies such as remedial system evaluation, monitored natural attenuation, State Historic Preservation Offices studies, wetlands delineations, value engineering studies, energy studies, schedule analysis, and cost estimating. The award will be an Indefinite Delivery/Indefinite Quantity, Multiple Award Task Order Contract for Environmental Remediation Services with a 5-year performance period with an option to extend services. Offers are due BY 12:00 PM CST on November 16, 2026. <https://sam.gov/workspace/contract/opp/872d2ab71d834b2f9170a55fa40fc2e3/view>

EMERGENCY AND RAPID RESPONSE SERVICES VI (ERRS)

U.S. Environmental Protection Agency, Region 5 Contracting Office, Chicago, IL
Opportunities on SAM.gov 68HE0526R0040, 2026

This is a total small business set-aside under NAICS code 562910. EPA requires a contractor to support Region 4's ERRS Contract. Task Orders may be issued on a performance-based, fixed-price, or time-and-materials basis. The contractor shall provide response support services for emergency, time-critical, non-time-critical removal actions, and remedial actions to mitigate or eliminate any hazard or damage to the environment resulting from the release or threat of release of hazardous substances, oil, and other contaminants or pollutants to the environment. The contractor shall perform any response services outside the region through regional "crosses" and any response action, under the direction of the ordering officer or OSC/RPM pre-designated by EPA, consistent with the terms and conditions of the contract, and in accordance with the directions of the task order work statement. Services may also be needed from other EPA regions. The contractor shall take any actions required to mitigate or eliminate any hazard or damage to human health and the environment resulting from: the release or threat of a release of oil, petroleum products, hazardous substances, pollutants or contaminants into the environment; threat of fire and explosion; incidents involving weapons of mass destruction, nuclear/radioactive-chemical threats and/or terrorist acts; and natural or man-made disasters. Response activities shall support EPA's obligations for CERCLA, NCF, OPA, Stafford Act, Homeland Security Act as well as any future laws or regulations promulgated pertaining to EPA's obligations. The contractor shall provide a management and personnel structure that will ensure that personnel are available on a 24-hour-a-day basis and maintain a 24-hour, seven days a week, year-round response capability to respond to EPA's needs pursuant to the terms of this contract on a regional, backup regional, cross-regional, national, and international response. The contract will be an indefinite-quantity contract with a period of performance that will include a five-year base period plus an optional period of 6 months. Offers are due by 5:00 PM EST on November 13, 2026. <https://sam.gov/workspace/contract/opp/28a2a28e547bf5390fa1539929e3012/view>

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Cleanup News

IN SITU TREATMENT OF TARGET AND PRECURSOR PFAS IN A GROUNDWATER PLUME USING A PERMEABLE BARRIER OF COLLOIDAL ACTIVATED CARBON

Earon, R., S. Sahlin, M. Pettersson, M. Montelius, L. Johnsson, K. Arnerdal, S. Hughes, G. Leonard, M. Filipovic, A. P. Cousins, J. Bergman, H. Nord, and D.B. Kleja.
Remediation 36(4):e70079(2026)

A full-scale colloidal activated carbon (CAC) barrier was implemented at a contaminated site with PFAS levels >100,000 ng/L to evaluate the technology's effectiveness in limiting PFAS migration within a natural groundwater system. A 70 m-long barrier was installed in 2023, followed by 2 years of monthly groundwater sampling from more than 50 groundwater observation wells. Monitoring results show that within the barrier, a > 99.9% reduction of Σ32PFAS was achieved, and concentrations in many groundwater observation wells dropped below 4 ng/L. Downstream concentrations at nearly all observation points that were expected to be influenced by the barrier decreased by >99.9%. Evidence of at least partial retention of ultrashort PFAS within the barrier was demonstrated during the monitoring period, as well as retention of non-target precursors. Results provided strong evidence and demonstrated a methodology for full-scale CAC barrier remediation that can effectively limit the spread of PFAS in natural groundwater systems. <https://onlinelibrary.wiley.com/doi/epub/10.1002/rem.70079>

PFAS VISUALIZATION CASE STUDIES FOR SITE CHARACTERIZATION, REMEDIATION, AND FORENSICS

Carey, G. | Northeast Waste Management Officials Association (NEWMOA) Webinar, 14 January, 78 minutes, 2026

A series of case studies explores the application of advanced visualization techniques to PFAS site characterization and remediation, demonstrating how complex environmental datasets can be transformed into intuitive, spatially integrated representations. The case studies illustrate the use of visualization tools to integrate multiple lines of evidence, including soil, groundwater, and other site characterization data, to better define contaminant distribution, identify potential source areas and migration pathways, and support refinement of conceptual site models. Converting complex datasets into interactive and visually accessible formats allowed the project teams to evaluate relationships that may be difficult to recognize through conventional data presentation methods alone. Visualization also supported improved communication of site conditions and technical findings among multidisciplinary project teams and stakeholders, providing a common framework for discussing uncertainty, prioritizing additional investigation, and evaluating potential remedial strategies. The case studies demonstrate that advanced visualization is more than a communication tool; when applied strategically, it can support interpretation and decision-making throughout the site management process. As PFAS investigations continue to generate increasingly large and complex datasets, visualization approaches offer an opportunity to improve the integration of site information, accelerate conceptual site model development, and provide clearer pathways from characterization through remedy selection and implementation. The lessons learned from these applications highlight the value of incorporating visualization early in the investigation process and demonstrate its potential to improve both technical understanding and stakeholder engagement at complex contaminated sites.

PDF: <https://www.newmoa.org/wp-content/uploads/2026/01/CareyPFASVisualization.pdf>

To download a copy of the webinar: <https://app.box.com/s/nken2pbm82bwr702zida324socr6r4f>

Visual PFAS Software: https://www.porewater.com/software_visualpfas.html

A SUSTAINABLE MULTI-FACETED REMEDIATION APPROACH TO ADDRESS CHLORINATED SOLVENT IMPACTS FROM ONSITE AND OFFSITE SOURCES

Sandoval, A., J. Neuhaus, and C. Lenker. | AEHS Foundation 35th Annual International Conference on Soil, Water, Energy, and Air, 16-19 March, San Diego, CA, 36 slides, 2026

A former latex and foam rubber manufacturing facility in an industrialized area in Southern California contains elevated concentrations of chlorinated VOCs, including PCE, TCE, and their daughter products, along with Cr(VI) and 1,4-dioxane in groundwater, soil, and soil vapor. Contamination stemmed from historical onsite operations and offsite sources, requiring a comprehensive remedial strategy. A multi-faceted remediation approach combining ISCO, ERD, phytoremediation, and SVE was implemented to address on- and off-site impacts. ISCO using alkaline-activated persulfate injections was first applied to degrade chlorinated solvents and 1,4-dioxane in the onsite source area. ERD was deployed using injections of molasses, emulsified vegetable oil and bioaugmentation cultures to address residual chlorinated solvent impacts and elevated Cr(VI) from ISCO. An SVE system was designed with 18 shallow and 15 deep wells. To cost-effectively address groundwater from offsite VOC plume migration, the TreeWell® phytoremediation system was installed along the eastern and northern site boundaries using Australian willow, purple-leaf acacia, and California sycamore trees with roots reaching groundwater ~30 ft bgs. ISCO achieved rapid initial reduction of chlorinated VOCs and 1,4-dioxane but caused elevated Cr(VI) and residual groundwater impacts. ERD demonstrated promising reductions in residual chlorinated VOCs and Cr(VI). The SVE system has extracted over 220 pounds of VOCs. The TreeWell trees have grown steadily (40-75%), though pest stress on acacias required replacement with willows. Beyond remediation benefits, the trees provide shade, reducing heat island effects and improving site usability. These efforts reflect an adaptive, effective and sustainable remediation strategy supported by ongoing monitoring and management.

https://s3.amazonaws.com/amz.xcdsystem.com/A51108D5-FA2F-2B6D-01D92AC0F42DCE3B_abstract_File25709/PDFofPresentation_174_0316125437.pdf

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Demonstrations / Feasibility Studies

SPLP VS. POREWATER FOR REMEDIAL DECISION-MAKING: ELLSWORTH AFB, SOUTH DAKOTA

Carey, G. | NEWMOA 2026 Northeast Conference on the Science of PFAS: Public Health & The Environment, 14-16 April, Worcester, MA, 38 slides, 2026

The representativeness of porewater samples and Synthetic Precipitation Leaching Procedure (SPLP) test results were evaluated for assessing PFAS mass discharge at the former fire training area at Ellsworth

Air Force Base. The study evaluated data from 15 lysimeters installed at shallow and deep locations within the vadose zone, along with soil PFAS concentrations, water saturation measurements, and site geology and hydrogeology. Multiple lines of evidence were used to evaluate whether porewater samples were reproducible and representative, including comparisons between monitoring events, vertical PFAS attenuation, the influence of water saturation on PFAS composition, and the effects of a semi-continuous clay layer located ~5 ft above the water table. Results indicated that porewater samples were sufficiently reproducible and representative for use in remedial decision-making, including estimation of soil-to-groundwater mass discharge. The investigation also demonstrated the importance of water saturation and air-water interfacial adsorption in controlling PFAS behavior within the vadose zone. SPLP results were compared with measured porewater concentrations. Results indicated that SPLP leachate concentrations were not representative of PFAS concentrations in porewater without modification. Differences were attributed in part to the large liquid-to-liquid dilution factor associated with the SPLP procedure and to PFAS adsorption at air-water interfaces, which affects PFAS behavior in the vadose zone but is not captured in the same manner by SPLP testing. SPLP testing may also overestimate short-chain PFAS partitioning coefficients. Porewater measurements, supported by multiple lines of evidence, can provide a more representative basis for evaluating PFAS mass discharge and remedial decisions at vadose-zone source areas. Additional evaluation of SPLP test duration and PFAS leaching behavior is recommended to improve the applicability of lab leaching tests for site-specific assessments.

https://www.newmoa.org/wp-content/uploads/2026/04/SC_3_Carev.pdf

A FIELD DEMONSTRATION STUDY: ACTIVATED CARBON-BASED AMENDMENT USED TO REMEDIATE PFAS SOURCE SOIL AND GROUNDWATER AT A NORTHERN MICHIGAN AIRFIELD

Moore, R. E. | NEWMOA 2026 Northeast Conference on the Science of PFAS: Public Health & The Environment, 14-16 April, Worcester, MA, 34 slides, 2026

This presentation describes a field demonstration of colloidal activated carbon (CAC) to remediate PFAS-impacted groundwater and source soils in situ at Grayling Army Airfield. The remedial approach focused on enhanced PFAS retention through adsorption, aiming to stabilize the source area, prevent continued contaminant discharge, and reduce plume migration. The groundwater pilot test was conducted within a 15- to 27-ft bgs treatment interval in predominantly coarse- to fine-grained sand underlain by clay. The site had a groundwater velocity of ~250 ft/year and contained PFAS, primarily PFOS and PFHxS, as well as PCE. Nine direct-push injection points were used to distribute ~8,500 gals of CAC solution at an average injection pressure of 16 psi and average flow rate of 6.45 gals/min. The treatment design incorporated site-specific contaminant flux, competitive sorption, natural organic matter, and other site characteristics. High-resolution flux measurements were used to identify contaminant flux zones and optimize amendment placement. Post-injection monitoring included groundwater sampling, additional downgradient wells, soil cores, piezometers, and testing intended to verify CAC distribution. PFAS concentrations decreased following CAC application while indicating that site hydraulic characteristics remained relatively unchanged based on pre- and post-injection slug testing. Additional wells installed six months after treatment expanded the monitoring network and provided further evaluation of downgradient PFAS concentrations. The presentation also describes application of an activated-carbon-based amendment to PFAS-impacted vadose-zone soils using an engineered microaggregate containing CAC and powdered activated carbon. When dispersed with soil moisture or added water, the amendment distributed through the soil and provided adsorption sites for PFAS, with the goal of immobilizing PFAS and reducing leaching to groundwater. Baseline soil leachability testing, including SPLP and TOP assay analyses, was used to evaluate treatment performance.

https://www.newmoa.org/wp-content/uploads/2026/05/9C_1_Moore.pdf

VERTEBRAE™ SEGMENTED HORIZONTAL WELLS FOR MONITORING PFAS MASS DISCHARGE

Divine, C., J. Wright, K. Hasbrouck, B. Parker, S. Chapman, J. Munn, and L. Robinson. ESTCP Project ER20-5026, 2655 pp, 2025

The objective of this project is to demonstrate the Vertebrae™ well system (VWS), a next-generation multiport horizontal well technology, for monitoring changes in PFAS contaminant mass flux/discharge in groundwater through time. Multiple VWSs were installed at the Grayling Army Airfield in Grayling, Michigan. Two VWSs (at different depth intervals) were installed transverse to groundwater flow (i.e., transects) downgradient of a PFAS source area. Following installation, performance monitoring was completed to assess various performance objectives. The demonstration confirmed the integrity of the grout seals separating screen sections, well screens can be placed accurately (± 1.5 vertical ft) within the subsurface (in comparable settings), single-well tracer techniques and fiber-optic based distributed temperature sensing can be used to quantify groundwater flux, and the technology is appropriate for quantifying mass flux/discharge along transects. The main cost drivers of the technology are the number of VWSs and segments, VWS length and depth, and site lithology. As a simple example, two 500-ft-long VWSs (installed in comparable settings), both with up to 10 screens, can generally be installed in less than 1 week and drilling and materials may cost ~\$150,000. Costs for longer wells (800 to 1,200 ft) increase linearly, while the cost per foot increases for shorter wells (less than 300 feet).

<https://sepub-prod-0001-124733793621-us-gov-west-1.s3.us-gov-west-1.amazonaws.com/s3fs-public/2025-07/ER20-5026%20Final%20Report.pdf?VersionId=NXI3pZ0Xrz3c4eQnJ98qe.ksfIKJ8cID>
Also see *Groundwater Monitoring & Remediation* article: <https://ngwa.onlinelibrary.wiley.com/doi/10.1111/gwrm.70060>

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Research

REMEDICATION OF PER- AND POLYFLUOROALKYL SUBSTANCES IN SIMULATED GROUNDWATER COMBINING AN IRON COATED REACTIVE BARRIER WITH ELECTRO-ASSISTED REGENERATION

Uwayezu, J.N., A.L. Tasca, I. Carabante, and J. Kumpiene.
Journal of Environmental Management Volume 414:130521(2026)

A reactive barrier composed of powdered peat coated with iron oxyhydroxides (Fe-P) was evaluated for PFAS retention under conditions simulating groundwater flow. Experiments were conducted using horizontal flow-through reactors operated at different seepage velocities to represent groundwater flow across varying soil structures. At the lowest seepage velocity, the Fe-P barrier effectively retained long-chain PFAS, including PFOS, PFOA, PFHpS, as well as FhXSA, achieving retention exceeding $C/C_0 = 0.3$ at a bed volume of 280. Following PFAS loading, electrokinetic treatment was applied to assess the potential for the regeneration of the spent reactive barrier. Electro-assisted regeneration promoted the displacement of sorbed PFAS toward the anode, resulting in the relocation of ~80% of PFAS into the first 40% of the reactive barrier. The process required an energy consumption of ~2.1 kWh/kg, indicating its potential for scaling up for regeneration. However, PFOS and PFHxSA exhibited limited migration under the applied electrical conditions, indicating that optimized electrokinetic parameters may be required to effectively address all PFAS classes.

Fe²⁺/O₂-BASED ADVANCED OXIDATION PROCESS COUPLED WITH AIR SPARGING/ CIRCULATION WELL FOR IN-SITU GROUNDWATER REMEDIATION: SYNERGISTIC TECHNOLOGIES CONSTRUCTION AND FEASIBILITY ASSESSMENT

Wang, D., Y. Wang, W. Zhao, C. Zhang, K. You, H. Zhang, and C. Qin.
Journal of Hazardous Materials 514:142647(2026)

A study established two synergistic systems of Fe²⁺/O₂/tripolyphosphate (TPP)-air sparging (AS) and Fe²⁺/O₂/TPP-groundwater circulation wells (GCW) via column and tank tests, and systematically evaluated their remediation performance toward typical organic pollutants under varied hydrogeological and operational conditions. In the Fe²⁺/O₂/TPP-AS system, phenol removal was superior in permeable aquifers. In homogeneous aquifers, removal efficiency increased with grain size, reaching 94.1% in coarse sand. In heterogeneous aquifers, high-permeability lenses promoted water circulation and pollutants degradation via bubble pulsation, while low-permeability lenses caused gas bypassing and uneven remediation. For nitrobenzene, aeration alone achieved 43.2% removal in 24 h with tailing; simultaneous aeration-oxidation increased removal to 46.7% in 10 h, reducing time and tailing concentrations. In the Fe²⁺/O₂/TPP-GCW system, partially-screened injection expanded the remediation zone, while fully-screened media improved average removal efficiency. Continuous reagent injection with partially-screened wells achieved 70.85% average p-nitrophenol removal in heterogeneous media containing a low-permeability lens. Thus, Fe²⁺/O₂/TPP-GCW offers better controllability under complex conditions. Remediation efficiency of both systems depends on media structure, aeration mode, and injection strategy.

SUSTAINABLE SOLIDIFICATION/STABILIZATION OF CHROMIUM (VI)-CONTAMINATED SOIL USING ENZYME-CARBONATED REACTIVE MAGNESIA CEMENT: A NOVEL ECO-FRIENDLY APPROACH

Shi, M., D.-L. Wang, J.-Y. Shi, W.-B. Chen, H.-L. Li, Y.-S. Yang, and C.-S. Tang.
Journal of Environmental Management 410:130060(2026)

The feasibility of an innovative enzyme-carbonated reactive magnesia cement (ECRMC) method was proposed and validated for solidification/stabilization (S/S) of Cr(VI)-contaminated soil. The systematic investigation focused on the key parameter effects of urea pre-hydrolysis time and RMC content. Experimental results demonstrated that the ECRMC technology can significantly enhance soil strength while reducing Cr(VI) leaching, achieving a maximum unconfined compressive strength (UCS) of 6.96 MPa at 6 h and a 97% reduction in Cr(VI) leaching at 24 h (25% RMC). The 6-24 h pre-hydrolysis range serves as a goal-driven decision interval based on strength-priority or safety-priority requirements. S/S performance of the ECRMC technology is governed by urea pre-hydrolysis time and RMC content. Urea pre-hydrolysis treatment significantly enhanced the formation of hydrated magnesium carbonates (HMCs) by avoiding the enzyme inactivation after mixing with RMC, leading to a 680% increase in UCS, while increasing RMC content further improved UCS but concurrently reduced the degree of carbonation (DC). The formed HMCs and brucite were identified as the dominant products through microstructural analysis. Their synergistic effects of adsorption, co-precipitation, and physical encapsulation contributed to both improved mechanical strength and efficient Cr(VI) immobilization. Furthermore, a quantitative relationship between Cr(VI) fixation and DC was revealed by incorporating the reaction pathways of RMC under hydration and carbonation conditions, enabling quantitative evaluation of Cr(VI) fixation.

MULTI-ELEMENT (C, N, CL) STABLE ISOTOPE FRACTIONATION DURING REDUCTIVE DECHLORINATION OF CHLOROANILINES

Wang, S., D. Gloeckler, S. Kummel, S. P. Araujo, L. Lomheim, L. A. F. S. Ribeiro, D. Toledo Ramos, V. Gamez Grijalva, L. Adrian, E. E. Mack, E. A. Edwards, and E. Passeport.
Environmental Science & Technology 60(33):23306-23318(2026)

This study reports multi-element isotopic fractionation (ϵ) associated with reductive dechlorination of 2,3-dichloroaniline (2,3-DCA) and 2-chloroaniline (2-CA) using a *Dehalobacter*-dominated enrichment culture. During 2,3-DCA dechlorination, significant C ($\epsilon_C = -8.1 \pm 0.3\%$) and Cl ($\epsilon_{Cl} = -7.5 \pm 0.1\%$) isotope fractionation was observed (AC-Cl = 1.12 ± 0.09), while N isotope fractionation was insignificant ($\Delta \delta^{15}N < 1\%$). Similarly, reductive dechlorination of 2-CA yielded $\epsilon_C = -8.9 \pm 0.3\%$ and $\epsilon_{Cl} = -18.1 \pm 0.4\%$ (AC-Cl = 0.48 ± 0.03), with negligible changes in $\delta^{15}N$. The large and comparable apparent kinetic isotope effects for C and Cl may suggest that both reactions share similar transition-state characteristics, with C-Cl bond cleavage as the rate-limiting step. In contrast to isotope fractionation reported for aerobic 2,3-DCA biodegradation, the distinct isotope patterns observed here enable differentiation between aerobic and anaerobic pathways. Using groundwater samples from a chloroaniline-impacted aquifer, the study showed that multi-element CSIA can help distinguish reductive dechlorination from aerobic biodegradation under spatially and temporally variable redox conditions.

IN-SITU SYNTHESIS OF IRON-BASED REACTIVE NANOPARTICLES FOR GROUNDWATER REMEDIATION IN HETEROGENEOUS TWO-AND-THREE-DIMENSIONAL POROUS MEDIA

Gallo, A., L. Magherini, F. Mondino, C. Bianco, T. Tosco, and R. Sethi.
Communications Earth & Environment 7:678(2026)

A study proposed a strategy for the synthesis of iron-based nanoparticles directly within contaminated aquifers. Harmless precursor solutions are co-injected and react within the porous medium to form reactive iron nanoparticles that can degrade chlorinated solvents. An analytical injection model was developed to guide reactive zone placement for each treatment design. The method was validated in a 3D pilot-scale homogeneous aquifer and in a 2D layered porous medium under lab conditions. In the 3D test, particle formation covered 96-112% of the target deposition volume, with a deposition yield of 77%. The generated iron-based particles removed more than 96% of tetrachloroethylene and trichloroethylene in 21 day-long batch tests. The proposed approach enables more controlled treatment of heterogeneous

SOL-GEL-ENCAPSULATED BIOFILMS ON BIOCHAR EFFECTIVELY DEGRADE PCBS AND EXTEND BIODEGRADATION ACTIVITY UNDER ENVIRONMENTALLY RELEVANT CONDITIONS

Dong, Q., W. Zhao, A. Martinez, R.F. Marek, K.C. Hornbuckle, X. Li, H.-J. Lehmler, G.H. LeFevre, and T.E. Mattes. | Environmental Science & Technology 60(40):28886-28898(2026)

A study systematically evaluated biodegradation and sorption of PCB congeners 4, 18, and 52, quantified biphenyl dioxygenase gene (*bphA*) abundance and expression, and characterized sol-gel and biofilm integrity of sol-gel-coated PCB-degrading biofilms on black carbon over 45 days under environmentally relevant conditions. Sol-gel coatings did not significantly inhibit PCB sorption to the black carbon. Sol-gel-coated biofilms achieved 72-92% PCB removal within 45 days, comparable to uncoated biofilms (>91%). Although PCB biodegradation rates in uncoated biofilms were >5-fold higher than sol-gel-coated biofilms, sol-gel-coated biofilms maintained >2-fold higher *bphA* expression levels than uncoated biofilms after 45 days of treatment. Lower temperature (10°C) decreased PCB biodegradation extent regardless of sol-gel coating but significantly increased (10-fold higher) *bphA* expression levels in sol-gel-coated biofilms. Salinity (20 g/L) negatively impacted *bphA* expression levels (>13-fold lower after 45 days) for all treatments. The sol-gel design demonstrates dual benefits: to sorb PCBs from the environment to biofilms and provide carbon sources for PCB cometabolism, thereby protecting and supporting biofilms for potential extended activity in future field applications.

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General News

CL:AIRE PFAS REMEDIATION TECHNOLOGY EVALUATION FRAMEWORK

CL:AIRE website, 2026

This framework was developed by the Environment Agency as part of a project called Lines of Evidence to Assess the Effectiveness of PFAS Remediation Technologies. The framework will help to develop a more robust and consistent regulatory approach to PFAS remediation across England. An overview fact sheet, four case study fact sheets and a 30-minute video have been created to help with the understanding and use of the framework. https://claire.co.uk/?option=com_content&view=article&id=7262&catid=503

DEVELOPMENT AND DEMONSTRATION OF PASSIVE SAMPLES FOR PFAS IN DIFFERENT MEDIA

Blaney, L. and J. Conder. SERDP & ESTCP Webinar, 72 slides, 2026

This SERDP and ESTCP webinar features passive sampling tools and approaches for improved characterization of PFAS in water and sediment to support cost-effective site investigation and long-term monitoring. The first presentation showcases a new approach to employ ion-exchange membranes as equilibrium passive samplers for diverse PFAS to inform time-averaged concentrations and lower the overall cost, effort, and burden of monitoring programs. The selectivity coefficients for more than 20 anionic PFAS were measured under variable water quality conditions. Using those data, corrections based on first principles were developed for pH, temperature, salt type and concentration, and dissolved organic matter thereby avoiding the need to create unique calibrations for each water source. This strategy was extended to select zwitterionic PFAS using both anion- and cation-exchange membranes, highlighting opportunities for passive sampling of precursors and other chemicals of concern. The second presentation describes results to date and the potential of applying ion-exchange materials as passive samplers for PFAS. The overall goal was to demonstrate and validate the use of passive samplers using a commercially available dialysis-based passive sampler (PFASsive™) for measuring PFAS in sediment and surface water. Two comprehensive field studies were conducted at 29 stations at two different DoW AFF sites. The presentation discusses PFAS passive sampler results compared to results from traditional sampling approaches and measurements of PFAS bioavailability. The presentation also highlights an overview of the project's PFAS passive sampling user's guide that provides practical information and detailed cost analysis to aid end users involved in planning and conducting PFAS passive sampling investigations. <https://www.youtube.com/watch?v=no5hnwKsAVI>

ADVANCES IN THE DETECTION AND MONITORING OF UNDERWATER MUNITIONS MOBILITY

DuVal, C., J. Puleo, and P. Traykovski. SERDP & ESTCP Webinar, 61 slides, 2026

This SERDP and ESTCP webinar highlights advancements in the detection and monitoring of underwater munitions mobility in dynamic marine environments. The presentation describes results from a year-long study at Reid State Park, Maine. Long-duration monitoring methods applied during the study are discussed, along with their role in improving predictive models of munition mobility and burial. These advancements support more informed decision-making and improved management of underwater Munitions Response Sites, benefiting DoW efforts to address legacy munitions challenges. <https://serdp-estcp.mil/resources/details/81e0ab16-48fe-41e7-8246-679391bd6f6a/advances-in-the-detection-and-monitoring-of-underwater-munitions-mobility>

MODEL-BASED ECONOMIC ANALYSIS UNDER UNCERTAINTY FOR PFAS TREATMENT BY GRANULAR ACTIVATED CARBON AND ION EXCHANGE TECHNOLOGIES

Barber, H., K.A. Sitterley, M. Hardikar, A.A. Atia, A.V. Dudchenko, and F.V. Lima.

Journal of Environmental Management 404:129407(2026)

Work employed published data regressions, statistical models, techno-economic analyses, and other process systems tools in a model-based uncertainty framework to consider the limitations of emerging contaminant research. Through this analysis framework, economic results are provided as probabilistic distributions based on the uncertainty of the models and diverse conditions that treatment facilities experience. Regressed parameter distributions and model predictive performance trends for each technology are identified based on PFAS structure and chain length. GAC systems are evaluated at consistently lower levelized costs of water with less economic risk over IX systems considering uncertainty across most design conditions and PFAS species. Both technologies are evaluated to have comparable adsorbent usage intensity on a volume basis, indicative of similar sustainability.

IN SITU COLLOIDAL ACTIVATED CARBON FOR PFAS REMEDIATION IN GROUNDWATER: PRINCIPLES, PERFORMANCE EXPECTATIONS, AND LESSONS FROM THE FIRST DECADE

Birnsting, J. Groundwater Monitoring & Remediation 46(3):124-145(2026)

A decade of publications and field experience was synthesized to define practical design and performance expectations for colloidal activated carbon (CAC)-based in situ PFAS remediation. An outline of governing principles and key features of CAC reagents shows how transport and emplacement behavior, enhanced sorptivity, and competitive PFAS/co-contaminant sorption control treatment longevity and spatial performance. Field data from 37 CAC barriers show PFAS concentration reductions of up to five orders of magnitude, with many post-treatment concentrations at or below reporting limits, while reactive-transport modeling under representative loading and competitive-sorption conditions indicates that well-designed CAC barriers can sustain protective performance over multidecadal to century-scale times. The authors argue that retention-in-place via CAC can achieve comparable risk reduction to active removal at lower lifecycle cost and liability, and outline conditions where integration with PFAS monitored retention may be advantageous. Practitioner experience highlights that accommodating matrix mass, competitive interactions, and flux delineation in design, together with optimized monitoring well placement, is critical to achieving and interpreting CAC performance. <https://ngwa.onlinelibrary.wiley.com/doi/epdf/10.1111/gwmr.70062>

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