Entries for October 1-15, 2025

Market/Commercialization Information

MID-PLUME GROUNDWATER REMEDIATION AT THE WALTON & LONSBURY SUPERFUND SITE, ATTLEBORO, MASSACHUSETTS (SNOTE)
U.S. Army Corps of Engineers, North Atlantic Engineer Division, New England District, Concord, MA
Contract Opportunities on SAM.gov, 2025

This special notice is to provide information for the Pre-Solicitation site walk for the mid-plume groundwater remediation at the Walton & Lonsbury Superfund Site in Attleboro, Massachusetts. The site walk is scheduled for Tuesday, November 25, 2025, at 1:00 PM EST. Participants should park in the main lot at Hayward Field, located at 79 North Avenue, Attleboro, Massachusetts, directly across the street from Walton Street and the project site. For any questions, please contact the Contract Specialist. https://sam.gov/workspace/contract/opp/df7d76a683584cbfabe39b6a0ab60d0f/view

EPA WATER RFP (SOL)
U.S. Environmental Protection Agency, Region 9 Contracting Office, San Francisco, CA
Contract Opportunities on SAM.gov 68HE0925R0015, 2025

This is a full and open competition under NAICS code 541620. EPA's Region 9 Contracting Office seeks a contractor to support implementation of EPA's responsibilities under the Clean Water Act and the Safe Drinking Water Act. Services will include response and support activities, preparedness and risk management, technical support, data management, training, and quality assurance/quality control (QA/QC). During performance, the contractor shall provide all analyses, options, recommendations, reports, training materials, and other work products in draft form for review and approval by the Contracting Officer (CO) or Contracting Officer's Representative (COR) before use or distribution. The contractor may be requested, but is not required, to provide support outside Region 9, including backup regional, cross-regional, or national responses, and shall be prepared to provide scientific and technical assistance for EPA's water emergency responses as well as routine water program activities. For each assigned task, the contractor shall furnish qualified personnel with current credentials or certifications, and provide all necessary supplies, materials, tools, and equipment to complete the work. Unless otherwise specified, these activities are intended to support the entire water sector, including drinking water systems (sources, pumping, storage, treatment, and distribution), wastewater systems (collection, treatment, storage, and discharge), and stormwater systems (conveyance, storage, and as-needed treatment). The contract will include a one-year base period anticipated to begin on January 15, 2026, and four one-year option periods. Offers are due by 8:00 PM EST on December 12, 2025. https://sam.gov/workspace/contract/opp/49923da7ed35451bb89abc4be1c3792f/view

Z -- FRANKLIN SLAG PILE SUPERFUND REMEDIATION PROJECT (SOL)
U.S. Army Corps of Engineers (USACE), Engineer Division North Atlantic, Philadelphia District, Philadelphia, PA
Contract Opportunities on SAM.gov W912BU26BA002, 2025

This is a total small business set-aside under NAICS code 237990. USACE requires a contractor to remediate the Franklin Slag Pile Superfund site that contains slag material associated with smelting operations, located adjacent to the site. The slag pile was combined and graded into a stable stockpile and encapsulated under an interim 40 mil HDPE geocomposite liner cap. The final ROD is to eliminate the future potential impact on the local community under this temporary remedy and allow this site to be redeveloped to improve the economy of the community. Major work to be performed as part of the remediation include, but are not limited to: preparing preconstruction workplans; developing, obtaining approval for, and implementing a Maintenance of Traffic Plan; mobilizing and implementing the Security Plan; implementing the Environmental Protection Plan and Perimeter Air Monitoring Plan; conducting bench-scale testing; establishing containment and decontamination zones and setting up decontamination stations; installing underground utility crossovers at all vehicle entrances; abandoning groundwater monitoring wells; performing selective demolition; relocating on-site slag to increase available work areas; designing and constructing temporary stockpile areas; excavating and treating slag pile material; sampling treated slag batches and analyzing for TCLP metals and other waste characterization parameters; loading treated slag and transporting it to an approved Subtitle D landfill for disposal, or re-treating the slag if characterization fails; excavating native soil; conducting waste characterization analyses; performing post-excavation confirmatory sampling; loading and transporting native soil to an approved Subtitle D landfill for disposal upon approval, or re-treating material as needed; importing clean material and backfilling excavations; installing aggregate base cover material; installing new monitoring wells; demobilizing; and conducting eight quarters of groundwater sampling. The award will be a firm-fixed price construction contract. Offers are due by 1:00 PM EST on December 15, 2025.
https://sam.gov/workspace/contract/opp/0755f894c1c447ecaba59424c5a603d0/view

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Cleanup News

TREES AND MICROBES AS SUSTAINABLE NATURE-BASED TREATMENT ON HYDROCARBONS AND MIXED WASTE SITES
Cohu, C., J. Freeman, G. O'Toole, R. Murphy, and E. Guttman. I RemTech 2025: Remediation Technologies Symposium, 15-17 October, Banff, Alberta, Canada, 33 slides, 2025

This presentation covers design methodologies and data from full-scale phytoremediation for several hydrocarbon and mixed waste installations utilizing Endophyte-Assisted Phytoremediation System (EAPS) technology and shows how they have successfully met sustainability goals. Synergistic bioremediation tools and innovative techniques were deployed to address several classes of contaminants, including chlorinated VOCs, petroleum hydrocarbons, and 1,4-dioxane and mixed waste. Success with phytoremediation comes from careful site assessment and selection of appropriate tree and microbe varieties. Data and lessons learned were highlighted from contaminated sites across the U.S., where EAPS is currently installed to treat petroleum hydrocarbons and 1,4-dioxane compounds in soil and groundwater. Among the lessons learned are confirmation that endophytes contribute to phytoremediation success, improved plant establishment, in-planta degradation, and enhanced source-zone depletion rates. Data suggests that the selection and application of appropriate endophytes are the key factors in plant establishment on sites with phytotoxic concentrations. In addition, selecting site-appropriate tree varieties and providing them with consistent care is vital for establishment and long-term success on contaminated sites.
Slides: https://esaa.org/wp-content/uploads/2025/10/CHRIS-COHU.pdf
Longer Abstract: https://esaa.org/wp-content/uploads/2025/09/RT2025-program-Abstracts_16.pdf

10 YEARS OF NSZD APPLICATION IN AUSTRALIA - THE EVOLUTION FROM LNAPL ACTIVE REMOVAL TO NATURAL ATTENUATION
Smit, A. and M. Rousseau. I RemTech 2025: Remediation Technologies Symposium, 15-17 October, Banff, Alberta, Canada, 18 slides, 2025

The evolution of Natural Source Zone Depletion (NSZD) application in Australia over the past decade is charted in this presentation, beginning with early deployments of LI-COR flux chambers on LNAPL-impacted sites across the country. Drawing on a range of Australian case studies, the presentation explores the practical application of NSZD from both a consultant's and an independent EPA site auditor's perspective. It includes comparative data on observed NSZD rates across different geologies and hydrocarbon types and discusses how these findings have been used to support risk-based closure strategies. The presentation also reflects on the challenges and successes of engaging with regulators to build confidence in NSZD as a sustainable and scientifically robust remediation approach. What began as a novel concept is now an increasingly mainstream component of LNAPL management strategies in Australia. The evolution aligns with a broader shift toward sustainability in remediation, where minimizing emissions, reducing energy use, and supporting net-zero aspirations are becoming central to decision-making.
Slides: https://esaa.org/wp-content/uploads/2025/10/ANDRE-SMIT.pdf
Longer Abstract: https://esaa.org/wp-content/uploads/2025/09/RT2025-program-Abstracts_39.pdf

IMPLEMENTATION, OPERATION, AND ADAPTATION OF A LARGE-SCALE, LONG-TERM ISCO REMEDIATION PROJECT
Gallinari, A. and N. Marchand. I RemTech 2025: Remediation Technologies Symposium, 15-17 October, Banff, Alberta, Canada, 23 slides, 2025

This presentation describes implications and challenges that were experienced throughout the design, implementation, and operation of a 20-year environmental rehabilitation strategy for a 200,000 m^2 industrial mining site located in eastern Canada. In its seventh year of operation, the project addresses legacy petroleum hydrocarbon contamination through a multidisciplinary remediation plan that integrates chemical, biological, and hydraulic containment technologies. Adding to its complexity, rehabilitation is being conducted at an operational industrial site with a dense, aging, and poorly documented network of underground infrastructure, including fire mains, electrical lines, sewer systems, and decommissioned fuel lines, requiring careful coordination and risk mitigation using GIS data and a thorough approval process. The project included rigorous environmental monitoring and a robust health and safety framework. A continuous improvement philosophy at the core of the remediation plan allowed for many changes over time to the approach once scaled up from the extensive lab and pilot testing phases to onsite implementation. The ISCO injection technique was adapted after one year of testing to improve productivity and efficiency with a more cost-effective approach. After observing diminished mass removal during the second of two ISCO injections, the remediation approach was adapted to include a biotreatment polishing phase following the first ISCO injection. The chemical-biological treatment technology chain reflects a responsive, performance-based design philosophy. By adapting to field conditions and integrating feedback loops into the remediation process, the project offers valuable insights for long-term environmental restoration in similarly constrained and complex industrial environments.
Slides: https://esaa.org/wp-content/uploads/2025/10/ANNALISA-GALLINARI.pdf
Longer Abstract: https://esaa.org/wp-content/uploads/2025/09/RT2025-program-Abstracts_35.pdf

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Demonstrations / Feasibility Studies

PFAS DESTRUCTION BY A HAZARDOUS WASTE INCINERATOR: TESTING RESULTS
Troxler, W., W. Anderson, C. McBride, J. Whitehead, M. Klingerman, J. Kumm, P. Challa Sasi, S. Yankay, M. Modiri, S. Corum, C. Adkins, E. Redman, C. Laush, S. Hall, A. Jensen, S. Waters, D. Spangler, S. Neal, T. Bales, M. Mills, P. Potter, E. Shields, W. Roberson, and S. Jackson. EPA 600/R-25/172, 125 pp, 2025

This test program evaluated how effective incineration is in treating PFAS at a hazardous waste incinerator. For this effort, EPA scientists followed the procedure described in Appendix A of EPA's 2024 *Interim Guidance on the Destruction and Disposal of Perfluoroalkyl and Polyfluoroalkyl Substances and Materials Containing Perfluoroalkyl and Polyfluoroalkyl Substances* (https://www.epa.gov/pfas/interim-guidance-destruction-and-disposal-pfas-and-materials-containing-pfas). During the test, PFAS-containing AFFF, nine additional PFAS, and a hard to destroy perfluorocarbon, hexafluoroethane (C_2F_6), were added to the incinerator along with the typical hazardous waste feeds. The gaseous, liquid, and solid end products were sampled and analyzed for the presence of PFAS and other fluorinated compounds. Results showed that the measures of the incinerator's ability to destroy or remove contaminants, also called destruction and removal efficiencies, ranged from 99.95 to 99.9999% for the added PFAS tested under these conditions. Additionally, the analyses of the gas phase emissions showed low to non-detectable levels of volatile fluorinated compounds that could be considered PFAS or products of incomplete destruction. This is the most comprehensive PFAS incineration test to date and provides valuable data about PFAS incineration. However, it is not intended to be a general recommendation of incineration for the treatment of PFAS. There are uncertainties and limitations to the data that should be considered when evaluating the overall effectiveness of thermal treatment for PFAS.
https://cfpub.epa.gov/si/si_public_record_report.cfm?dirEntryId=367138&lab=CEMM&simplesearch=0&showcriteria=2&sortby=pubDate&timstype=&datebeginpublishedpresented=06/15/2019&searchall=PFAS

SMOLDERING PFAS-IMPACTED SOILS: FROM LABORATORY TO FULL-SCALE APPLICATIONS
Liefl, D. I 20th Annual Environmental Professionals of Arizona Conference, 3-4 March, Tempe, AZ, 34 slides, 2025

This project demonstrated a mobile, rapidly deployable treatment unit (STARxpress) designed to destroy PFAS in impacted soil using smoldering combustion at Joint Base Elmendorf-Richardson (JBER). The two-unit STARxpress system treated 440 cubic yards of PFAS-impacted soil at JBER in 10 batches, with all batches meeting Alaska cleanup levels for PFOS and PFOA, and some achieving levels below detection limits. The presentation provides an overview of the smoldering process, system design, and demonstration results.
https://www.epaz.org/assets/docs/Conference/2025/Bedrock%20-%20Day%2001%20-%20Q5%20-%20Dave%20Liefl%20-%20Savron.pdf
More information: https://www.savronsolutions.com/wp-content/uploads/2024/05/Savron-Case-Study-STARxpress-PFAS-JBER-2024-1.pdf

IN-SITU MICROBIAL TREATMENT TO REMEDIATE A HISTORICAL CRUDE OIL RELEASE WITHIN A WETLAND IN JASPER NATIONAL PARK, ALBERTA
Ostrander, M. and H. Anderson. I RemTech 2025: Remediation Technologies Symposium, 15-17 October, Banff, Alberta, Canada, 27 slides, 2025

The conceptual site model for the Jasper National Park historical release site identified contaminants of concern, including PAHs and petroleum hydrocarbons (PHCs), which were confirmed in both soil and groundwater, covering a total surface area estimated at 7,625 m^2, largely situated within a remote wetland area. Developing a remedial strategy required consideration of the site's sensitivities, challenges, and remedial objectives. Site-specific challenges included the lack of road access to the site, widespread soil and groundwater contamination, and working within a complex ecosystem. A remedial options analysis concluded that in situ microbial treatment was the optimal approach as it was considered low impact to the environment, feasible for a remote site, and site characteristics were suitable for the technique. To minimize impacts, helicopters were used to transport most of the equipment, supplies, and the dried microbial product to the site. After one application of the treatment, testing demonstrated that a reduction of 50% to 70% in petroleum hydrocarbon concentrations was observed at 90% of the site. Further microbial treatments are planned. The presentation focuses on the challenges limiting remedial options, the regulatory process, the remediation efforts conducted to date, including the methodology of implementing the microbial treatment, monitoring, challenges encountered during the program implementation, treatment success, and next steps.
Slides: https://esaa.org/wp-content/uploads/2025/10/MURRAY-OSTRANDER.pdf
Longer Abstract: https://esaa.org/wp-content/uploads/2025/09/RT2025-program-Abstracts_14.pdf

SMOLDERING TREATMENT OF PFAS: INVESTIGATION OF MASS BALANCE AND VOLUMETRIC SCALE UP FOR FIELD IMPLEMENTATION
Harrison, B.G., D.W. Major, L.L. Kinsman, J.K. Brown, J.L.D. Gabayet, J.I. Gerhard, D.J. Patch, K.P. Weber, L. Chernysheva, G.M. Brown, K. Doudrick, A. Abarca-Perez, G.F. Peaslee, K.D. Pennell, and K.E. Manz. ACS Omega 10(28):30489-30500(2025)

A study investigated smoldering combustion to destroy PFAS and scaled the technology up from the lab to field implementation. The first phase consisted of bench-scale tests using calcium oxide (CaO) as a soil amendment in some of the test cases. For all test conditions, >99.9% PFAS removal was achieved. Post-treatment soil without CaO amendment was found to have a significant reduction in total fluorine concentrations, while the fluorine concentrations in soil with CaO amendments were similar following treatment. This suggests that fluorine emissions from smoldering treatment of PFAS are captured by the presence of the calcium ion (Ca^{2+}). New analytical methods were used to better characterize the mass balance of the system. The lab results were carried out in a pilot study using soil from a PFAS-impacted site. Two large-scale tests treating 10 m^3 of soil were completed. Results agreed with the results from the lab phase. The results from both phases provide a greater understanding of the fate of PFAS when it is treated by smoldering and detail the first large-scale demonstration of smoldering treatment for PFAS-impacted soil.
https://pmc.ncbi.nlm.nih.gov/articles/PMC12290568/pdf/ao5c02257.pdf

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Research

RESEARCH BRIEF 368: NANOPARTICLES HELP PLANTS CLEAN UP FOREVER CHEMICALS
National Institute of Environmental Health Sciences, Superfund Research Program, October 2025

SRP-funded researchers developed a novel material that enhances the ability of plants to remove PFAS from soil and water via phytoremediation. Ultraporous mesostructured silica nanoparticles (UMNs) were developed and modified with chemical groups targeting the two main ways PFAS interact with other molecules. The UMNs were functionalized with chlorotrimethylsilane (TMS) to increase water repellence; polyethylene glycol (PEG), to improve dispersal in water and keep particles stable in suspension; and (3-aminopropyl)triethoxysilane (APTES), to add positive charges to attract negatively charged PFAS head groups. By testing and adjusting the ratios of PEG, TMS, and APTES, the team was able to fine-tune how water-repelling or water-attracting the nanoparticles were, as well as their overall surface charge. UMNs coated with equal parts TMS, PEG, and APTES were tested against a mixture of 24 PFAS compounds and removed nearly all the PFAS, including those typically resistant to cleanup. To test the potential for plant-based cleanup, UMNs were directly applied to a PFAS-polluted potting mix, and then zucchini plants were grown in the treated soil. The goal was to determine whether the presence of UMNs in soil would help plants absorb more PFAS. In contaminated soil without nanoparticles, zucchini plants absorbed an average of 123 ng PFOA. When UMNs were added, uptake increased; plants exposed to UMNs absorbed 215 nanograms, a 54.6% increase. Molecular dynamics computer simulations were run to understand why the UMNs coated with equal parts TMS, PEG, and APTES performed better. The team found that PFAS molecules attached through electrostatic interactions between their negatively charged head groups and the positively charged APTES and hydrophobic interactions between their fluorinated tails and the hydrophobic regions of the PEG/TMS surface.
https://tools.niehs.nih.gov/srp/researchbriefs/currentissue.cfm

INVESTIGATION OF A NOVEL PROTEIN-BASED IMMOBILIZATION PROCESS FOR PFAS CONTAMINATED SOILS
McKernan, J.L., E. Barth, K. Dasu, D. Cutt, S. Hartzell, J. Lilly, K. Sims, D. Siriwardena, and E. Kaltenberg. I Total Environment Engineering 4:100031(2025)

An innovative remediation strategy was explored using protein-based materials as chemical stabilization sorbents alongside cement-based solidification for PFAS-contaminated soil. Lower-cost, natural protein-rich materials (hemp seed meal, blood meal, and rendered slaughterhouse waste) were evaluated against GAC for sorption capacity of six PFAS (PFOA, PFOS, PFHxA, PFBS, 8:2 FTS, and PFNA) typically associated with AFFF. Sorption studies revealed blood meal had substantial PFAS binding capacity, though less than GAC, with longer-chain PFAS compounds exhibiting higher sorption across all sorbents tested. Protein-based sorbents maintained stable PFAS binding even at elevated pH, indicating compatibility with cement-based solidification. In soil stabilization (sorption) tests, GAC significantly reduced PFAS leachability, while blood meal showed variable effectiveness alone but improved when combined with cement, achieving immobilization results similar to GAC. Findings suggest protein-based sorbents like blood meal, combined with cement shortly (i.e., 10 to 20

days) after introduction, could be cost-effective alternatives for PFAS remediation. Further research is needed to assess long-term stability and suitability, optimize processes, and evaluate field-scale applicability.

VARIABILITY AND SCALE DEPENDENCE OF HYDRAULIC CONDUCTIVITY FOR HANFORD SITE SAND AND GRAVEL AQUIFERS
Khaleel, R. I Groundwater 63(5):790-811(2025)

A comprehensive compilation of a hydraulic conductivity (*K*) database (over 800 measurements) collected over the past seven decades is presented that encompasses test volumes ranging from lab to field scales for two principal sedimentary units at the Hanford site in south-central Washington State. While both units are gravel-dominated, the geometric mean *K* of the Hanford formation is orders of magnitude higher than that of the Ringold Formation for the permeameter and pumping test data. In contrast, the ln *K* variance across test volumes shows only moderate variation between the two units. Analysis of *K* values across different support scales reveals a clear scale dependence for the Hanford formation, while Ringold exhibits scale-invariant behavior at field scale. The differences arise from their distinct depositional processes; while the Ringold Formation was deposited gradually over geologic time by fluvial systems, producing consistent *K*, the Hanford Formation was deposited abruptly by catastrophic glacial floods, leading to scale-dependent *K* variability. The study underscores that scale dependence in unconsolidated sand and gravel aquifers is common but not universal. Calibrated inverse modeling of regional groundwater flow yields high *K* estimates, with the average for the Hanford formation paleochannel being ~15,000 m/d, ranging from 1,002 to 21,514 m/d. Multiple lines of evidence, including pumping tests, support model-calibrated high *K* estimates for the Hanford formation paleochannel comprised of open framework gravels. For both sedimentary units, the upscaled *K* estimates align with the inverse model-calibrated estimates for non-channel portions of the Hanford and Ringold formations.

REFINING PAH AND PCB BIOAVAILABILITY PREDICTIONS IN INDUSTRIAL SEDIMENTS USING SOURCE-FINGERPRINTING, PARTICLE SIZE, AND BULK CARBON, PUGET SOUND, WASHINGTON
Conn, K.E., A.R. Spanjer, and R.K. Takesue.
Marine Pollution Bulletin 222(Part 1):118634(2025)

Nearshore marine sediments in a Puget Sound industrial embayment were contaminated with PAHs, PCBs, and DDTs from sources that included creosote, industrial oil and tar waste, and a landfill. Elevated concentrations were confined to a ~300-m shoreline buffer in the industrial waterfront, suggesting high site fidelity and limited along-shore or offshore transport. Total PAH concentrations approximately doubled when including alkylated compounds. The industrial sediments often exceeded toxicity criteria; however, chemicals were likely less bioavailable than predicted, partly due to assumed strong sorption to anthropogenic carbon, like coal tar. Analyses of separated particle-size fractions showed that about half of PAHs were associated with particles > 500 µm, suggesting that a wide range of particle sizes are relevant to occurrence and transport. Predicted freely dissolved chemical concentrations in sediment pore water were unrealistically high using a bulk organic carbon sorption coefficient. When reduced to environmentally reasonable levels by applying a high-sorption partition coefficient applicable to contaminated sediments, predicted freely dissolved concentrations in some industrial sediments exceeded sublethal effect levels or surface water quality standards. Chemical assemblages predicted in the freely dissolved aqueous fraction, which is relevant for biotic uptake from water, shifted to predominantly low molecular weight as compared to sediment, highlighting the role of exposure pathways in bioavailability. Insights from chemical fingerprinting coupled with co-analysis of bulk carbon and grain size allowed refinement of bioavailability assessments of complex chemical mixtures in contaminated nearshore environments that are relevant for ecosystem health and restoration.

MINERALIZATION OF CAPTURED PERFLUOROOCTANOIC ACID AND PERFLUOROOCTANE SULFONIC ACID AT ZERO NET COST USING FLASH JOULE HEATING
Scotland, P., K.M. Wyss, Y. Cheng, L. Eddy, J.L. Beckham, J. Sharp, Y. Chung, C.H. Choi, T. Si, B. Wang, J.A. Donoso, B. Deng, Y.-Y. Shen, S.G. Zetterholm, C. Griggs, Y. Han, M. Tomson, M.S. Wong, B.I. Yakobson, Y. Zhao, and J.M. Tour. I Nature Water 3:486-496 (2025)

A rapid electrothermal mineralization (REM) process was developed to remediate PFAS-contaminated soil. With environmentally compatible biochar as the conductive additive, the soil temperature increases to >1000°C within seconds by current pulse input, converting PFAS to calcium fluoride with inherent calcium compounds in soil. This process is applicable for remediating various PFAS contaminants in soil, with high removal efficiencies (>99%) and mineralization ratios (>90%). While retaining soil particle size, composition, water infiltration rate, and cation exchange capacity, REM facilitates an increase in exchangeable nutrient supply and arthropod survival in soil, rendering it superior to the time-consuming calcination approach that severely degrades soil properties. REM is scaled up to remediate soil at 2 kg/ batch and is promising for large-scale, onsite soil remediation. Life-cycle assessment and techno-economic analysis demonstrate REM as an environmentally friendly and economic process, with a significant reduction of energy consumption, greenhouse gas emission, water consumption, and operation cost, when compared to existing soil remediation practices. https://www.nature.com/articles/s44221-025-00404-z

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General News

STRATEGIC DELINEATION AT PER- AND POLYFLUOROALKYL SUBSTANCE (PFAS) –CONTAMINATED SITES: A FRAMEWORK COMBINING SOURCE IDENTIFICATION, BACKGROUND ASSESSMENT, AND PLUME MIGRATION INSIGHTS FOR REMEDIAL INVESTIGATIONS
Modiri, M., F. Torres, L. Flores, and R.H. Anderson. Remediation 36(1):e700400(2025)

A conceptual and systematic framework is essential for conducting a remedial investigation for PFAS, especially considering growing knowledge related to the novelty of their fate and transport and ubiquity in the environment. To address this need, at least as it pertains to defining the nature and extent of contamination, this article summarizes various methods presented to date and recommends a standard of practice that balances trade-offs between technical rigor and cost as a systematic guide for practitioners consistent with the state of the science.

RAPID EVIDENCE ASSESSMENT OF PFAS INCINERATION AND ALTERNATIVE REMEDIATION METHODS
UK's Environment Agency Scientist Group report, 181 pp, 2025

This review assessed the effectiveness, feasibility, and environmental suitability of current and emerging technologies for treating PFAS, with a focus on high-temperature incineration. It also considered alternative PFAS remediation technologies for their practical feasibility, treatment performance, and environmental effects. Knowledge in three areas is described: (i) the operational conditions required for consistent and near-complete PFAS mineralization; (ii) the formation and environmental fate of products of incomplete combustion (PICs) during HTI; and (iii) the effectiveness of current emissions and residue monitoring practices. The review aims to build a strong evidence base to support shaping risk prevention strategies; provide practical insights for industry stakeholders and inform future regulatory strategy, operational decision-making, and infrastructure planning, in response to tightening UK and international restrictions on PFAS use and disposal. https://assets.publishing.service.gov.uk/media/68dd29d9dadf7616351e4ccc/Rapid_evidence_assessment_of_PFAS_incineration_and_alternative_remediation_methods_-_report.pdf

NON-AQUEOUS PHASE LIQUIDS IN THE SUBSURFACE: OVERLOOKED LONG-TERM SOURCES OF PFAS?
Ford, J., J. Field, C. Heron, and S. Park.
Environmental Science & Technology 59(40):21379-21381(2025)

AFFF used to manage hydrocarbon fires at airports, refineries, fuel terminals, and fire training areas led to the co-release of PFAS and LNAPL at numerous sites globally. PFAS partitioning at the LNAPL-groundwater interface has received more attention than PFAS partitioning into bulk LNAPL under unsaturated conditions. As a result, existing research does not provide sufficient information to develop effective remedial solutions targeting PFAS in groundwater downgradient of PFAS-impacted LNAPL. More research is needed to design appropriate remedial systems, especially given the low groundwater standards for PFAS. In addition to considering the presence of petroleum co-contaminants, the following information related to PFAS-impacted LNAPL should be known: (1) an estimate of the total mass of PFAS, in particular, PFAS with applicable regulatory standards; (2) the mass flux of PFAS compounds; and (3) the mass of precursor compounds that may transform into regulated PFAS. https://pubs.acs.org/doi/pdf/10.1021/acs.est.5c09024?ref=article_openPDF

BUILDING A ROBUST LCSM FOR REMEDIATION DECISION-MAKING: NEXT-GENERATION TOOLS
Furbacher, P., L. Wu, E. Haack, T. Mafa-Attoye, D. Obregon Alvarez, K. Dunfield, J. Smith, G. Scarzella, and C. Harris. I RemTech 2025: Remediation Technologies Symposium, 15-17 October, Banff, Alberta, Canada, 39 slides, 2025

An LNAPL-Conceptual Site Model (LCSM) currently in development integrates microbial community traits and degradative capacity with quantification of compositional weathering, cumulative degradation rates, LNAPL mobility, and vertical and horizontal gradients in overburden and bedrock facies. It integrates multiple advanced techniques, including unsupervised learning, to interpret generated datasets:

- Natural source zone depletion rates calculated using soil gas gradients.
- LNAPL Compositional Change and Cumulative LNAPL Mass Loss: use of high-resolution GC-MS compositional analysis with Principal Component Analysis to identify patterns and extent of weathering. Cumulative LNAPL Mass Loss was estimated when no single compound could serve as a biomarker.
- Probing PHC biodegradation: Coupling Compound-Specific Isotope Analysis (CSIA) with microbial community composition and functional potential to support a mechanistic understanding of the observed changes in PHC composition.
- Transmissivity Testing: used to identify those hydrogeological units from which hydraulic LNAPL recovery may be viable.

The presentation discusses how the LCSM is applied to inform exposure control (seep management) and evaluate remedial alternatives. The presentation also shares lessons learned and highlights the value of high-resolution methods in advancing LCSM practice. ***Slides:*** https://esaa.org/wp-content/uploads/2025/10/PAUL-FURBACHER.pdf ***Longer Abstract:*** https://esaa.org/wp-content/uploads/2025/09/RT2025-program-Abstracts_37.pdf

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 and Emergency Management at adam.michael@epa.gov or (703) 399-4268 with any comments, suggestions, or corrections.

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