Technology Innovation News Survey

Entries for June 1-15, 2024

Market/Commercialization Information

F -- MANSFIELD TRAIL SUPERFUND SITE OU2

U.S. Army Corps of Engineers, Northwestern Division, Kansas City, MO
Contract Opportunities on SAM.gov W912DQ24R3100, 2024

When this solicitation is released on or about July 26, 2024, it will be competed as a total small business set-aside under NAICS code 562910. The U.S. Army Corps of Engineers plans to issue a solicitation for conducting a remedial action of Operable Unit 2 at the Mansfield Trail Superfund Site (MTSS) in Byram Township, New Jersey. This work is expected to be done under an Indefinite Delivery/Indefinite Quantity (ID/IQ) Single Award Task Order Contract (SATOC). The SATOC will provide the Government with continuity of personnel and institutional knowledge for implementing a streamlined response and flexible vehicle for cost-effective soils and groundwater remediation at the MTSS. Work may include, but is not limited to, site definition, studies, decision documents, designs, interim actions, environmental remediation, short-term operation and maintenance, laboratory management, reports, and any other actions necessary to implement the soils and groundwater remedies at the MTSS.The capacity of the SATOC is $49 Million. Orders will be firm fixed price and/or cost-plus fixed fee. There is no solicitation at this time. https://sam.gov/opp/58312ead10964890adac18f4bbb0cbe9/view

F -- FUSRAP REMEDIAL ACTION SERVICES AT THE ST. LOUIS SITES

U.S. Army Corps of Engineers, Mississippi Valley Division, St. Louis District, St. Louis, MO
Contract Opportunities on SAM.gov W912P923R0057, 2024

This is a total small business set-aside under NAICS code 562910. The U.S. Army Corps of Engineers, Mississippi Valley Division, St. Louis District, requires support for remediating St. Louis Formerly Utilized Sites Remedial Action Program (FUSRAP) sites that contain low-level radiological and chemically contaminated material. The St. Louis Sites are in the metropolitan St. Louis area in two primary vicinities, the St. Louis Downtown Site (SLDS) and the St. Louis North County Sites (NORCO). The NORCO Sites include the St. Louis Airport Site (SLAPS), SLAPS Vicinity Properties (SLAPS VPs), which include Coldwater Creek and adjacent properties, and the Latty Avenue Properties (Latty). Work includes, but is not limited to: preparing site work plans; performing sampling analyses; performing GIS modeling of radiological contamination to support remedial design; performing preferential pathway analysis; remediating and restoring a creek bank using various methods (e.g., direct removal, dredging); performing excavation dewatering; collecting and controlling surface and/or groundwater; providing health physics and radiation safety training and monitoring; operating and maintaining air monitoring systems to provide early detection of potential contaminant emissions; performing remediation under a variety of conditions (e.g., open field, near/under structures, above and below ground water, near utilities); and packaging, transporting, and disposing of universal hazardous, industrial and "household" waste generated from remediation services (i.e., vehicle fluids, office trash, etc.). The award will be a Single Award Task Order Contract (SATOC) with task orders issued as cost-reimbursable Cost Plus Fixed-Fee (CPFF). Offers are due by 11:00 AM CDT on July 25, 2024. https://sam.gov/opp/4537339ca9314cdc8cf2a89c2f19618a/view

R--SOLICITATION NOTICE, START VI AMD 0002

U.S. Environmental Protection Agency, REGION 5, Chicago, IL
Contract Opportunities on SAM.gov 68HE0523R0059, 2024

This announcement intends on fulfilling upcoming Superfund Technical Assessment Response Team (START) requirements in Region 5 of EPA. The Superfund Division, Emergency Response branch in Region 5 requires contractor support under NAICS code 541620 to provide environmental consulting services in the environmental cleanup industry. These services primarily support Region 5 (IL, IN, MI, MN, OH, and WI). These services require performance in accordance with CERCLA, as amended, the National Oil and Hazardous Substances Pollution Contingency Plan and other environmental statues. Most of the technical support that the contractor shall be tasked as applicable for nationally consistent advisory and assistance to EPA's On-Scene Coordinators (OSCs) and other federal officials implementing EPA's responsibilities under the national response system. The prospective contractor will be required to provide services to support response and site assessment activities related to the release or threat of release of oil, petroleum products, hazardous substances, weapons of mass destruction or pollutants and contaminants that pose an actual or potential threat to human health and welfare, or to the environment. While performing the services, prospective vendors may use scientific equipment to measure/monitor environmental conditions and activities to further the Agency's primary mission: Protecting human health and the environment. The requirement limits several scientific equipments to specific brand names for purposes of compatibility with the ER national responder system, compatible with EPA-specific hardware and software, and equipment capable of measuring at EPA response action levels. Offers are due by 2:00 PM CDT on July 23, 2024. https://sam.gov/opp/5b42e85a17974d5aae1b1317a8c1257f/view

SPE603-24-R-5X04 DFSP CHARLESTON ENVIRONMENTAL SERVICES

Department of Defense Logistics Agency, Energy Command, Fort Belvoir, VA
Contract Opportunities on SAM.gov SPE603-24-R-5X04, 2024

When this solicitation is released on or about September 11, 2024, it will be competed as a total small business set-aside under NAICS code 562910. This pre-solicitation notice is for the upcoming solicitation for environmental remediation, environmental compliance, and environmental facility maintenance services at DFSP Charleston, SC. DLA Energy's Engineering, Environmental and Property Division (LEV) is responsible for funding, supporting, and overseeing execution of DLA Energy's environmental requirements. Site Closure (SC) is the primary goal of this effort while restoring and maintaining the Facility in a cost-effective manner. The period of performance is a four-year period, and it is estimated to be from April 1, 2025, through March 31, 2029, and a six-month extension provision from April 1, 2029, through October 31, 2029. The Government will award one (1) firm fixed-price contract from the RFP.
https://sam.gov/opp/4c00f89c083d41198f5ab573a037d8b9/view

Cleanup News

MANAGING THE REMEDIATION STRATEGY OF CONTAMINATED MEGASITES USING FIELD-SCALE CALIBRATION OF GEO-ELECTRICAL IMAGING WITH CHEMICAL MONITORING

Levy. L., T.S. Bording, G. Fiandaca, A.V. Christiansen, L.M. Madsen, L.F. Bennedsen, T.H. Jorgensen, L. MacKinnon, and J.F. Christensen.
Science of The Total Environment 920:171013(2024)

Source zone remediation at the Kaergard Plantation megasite in Denmark was monitored using high-resolution cross-borehole electrical resistivity tomography (XB-ERT) imaging calibrated by chemical analyses of groundwater samples. High levels of NAPL are targeted by in situ chemical oxidation using activated persulfate. It may take numerous injection points with extensive injection campaigns to distribute reagents, requiring an understanding of how reagents are transported within the aquifer. A large geophysical XB-ERT monitoring network was installed to identify untreated zones and help manage the remediation strategy. The combination of spatially continuous geophysical information with discrete but precise chemical information, allowed detailed monitoring of sulfate distribution produced during persulfate activation. Untreated zones identified in the first remediation campaign were resolved in the second campaign. The monitoring allowed for adjusting the number of injection screens and the injection strategy from one campaign to the next, with improved persulfate distribution and contaminant degradation in the second campaign. Geophysical transects repeated over the timespan of a remediation campaign allowed high-resolution time-lapse imaging of reagent transport, which could, in the future, improve the predictability of transport models, compared to only using on a- priori assumptions of the hydraulic conductivity field.
https://www.sciencedirect.com/science/article/pii/S0048969724011525

LOW-DISTURBANCE LAND REMEDIATION USING VERTICAL GROUNDWATER CIRCULATION WELL TECHNOLOGY: THE FIRST COMMERCIAL DEPLOYMENT IN AN OPERATIONAL CHEMICAL PLANT

Qiu, H., J. Xu, Y. Yuan, E.J. Alesi, X. Liang, and B. Cao.
Science of The Total Environment 944:173804(2024)

A novel combination of low-disturbance contaminant remediation technologies, including groundwater circulation well (GCW), pump and treat (P&T), and in situ chemical oxidation (ISCO) technologies, were applied at an active chemical plant with soil and groundwater contamination without halting production. Contaminated groundwater is removed through P&T and GCW, while GCW enhances ISCO, which focuses on eliminating the remaining hard-to-pump contaminants. Results show: (1) after two years, the contaminant levels in soil and groundwater were significantly reduced; (2) the average concentration reduction rate of four contaminants, including 1,2-DCE, methylbenzene, ethylbenzene, and M&P-xylene, exceeded 98%; and (3) the remediation strategy resulted in improved remediation efficiency. Specifically, the concentration of 1,2-DCE in observation wells dropped from 40,550. μg/L to 44.6 μg/L. The combined remediation approach can serve as a model for designing contaminant remediation projects that require minimal operational disruption.

IN SITU HEX-CHROME REDUCTION AT A COMPLEX SITE

Hyrman, J. I Northwest Remediation Conference, 2 May, Tacoma, WA, 10 slides, 2024

Historical releases of sodium dichromate resulted in Cr(VI) in soil and groundwater at a former chemical plant. The site is adjacent to the Portland Harbor Superfund site with a hydraulic gradient towards the Willamette River. Remedial goals were to immobilize Cr(VI) in groundwater, stop Cr(VI) migration into surface water, and keep Cr(VI) immobilized during future work. Bench- and pilot-scale testing was conducted to develop a full-scale plan. Pilot-scale testing of in situ reduction resulted in a 95% decrease from baseline concentrations. Full-scale implementation involved direct push through ~379 injection points to feed 1.3 million gallons of amendment during two injection rounds. Monitoring is ongoing. https://owremediation.com/wp-content/uploads/1A_Hyrman.pdf

A TALE OF TWO STATIONS ENHANCED BIOREMEDIATION CASE STUDIES

Parrott, P. I Northwest Remediation Conference, 2 May, Tacoma, WA, 21 slides, 2024

This presentation describes two enhanced bioremediation case studies ranging in cost, level of effort, and timeline. Site A was a former gas station on the Long Beach Peninsula between the Pacific Ocean and Willapa Bay. Leaks from USTs, ASTs, and surface spills resulted in subsurface contamination. Excavation removed >860 tons of petroleum-contaminated soil (PCS), but post-excavation samples confirmed that contamination persisted. Enhanced bioremediation was conducted using a recirculation system with 5 extraction wells, 9 injection trenches, and an average flow of 86,000 gal/mo to control the plume hydraulically, treat dissolved and adsorbed contaminants, and maximize contact between the treatment solution and contaminants. Site B was a former gas station in the Coast Range of Oregon. The site contained 5 ASTs and 7 USTs that leaked mainly along the western side of the building. The station building was removed in 2016 following the initial excavation of 42 tons of PCS, which extended under the building. An additional 86 tons of PCS were excavated. Bioremediation was conducted via pit application and injection of 1,000 lbs CBN, 75 gal PetroSolv, and 15 gal EZT-A2 TPH Bacterial Consortium into 15 injection points. Cleanup goals were achieved at both sites.
https://owremediation.com/wp-content/uploads/3B_Parrott.pdf

Demonstrations / Feasibility Studies

TRACKING GROUNDWATER REMEDIATION EFFORTS USING RARE EARTH ELEMENTS.

EPA Science Matters Newsletter, May 28, 2024

This edition of EPA's Science Matters Newsletter highlights research from the EPA Center for Environmental Solutions & Emergency Response. EPA scientists developed a new method to use patterns of rare earth elements to understand whether the contaminated groundwater interacted with the permeable reactive barrier (PRB) as intended. The method uses a High Resolution-Inductively Coupled Plasma-Mass Spectrometer to evaluate groundwater samples to understand groundwater chemistry and REE concentrations. It was demonstrated at several sites where a PRB is being used to treat contaminated groundwater. https://www.epa.gov/sciencematters/tracking-groundwater-remediation-efforts-using-rare-earth-elements

TARGET AND SUSPECT PER- AND POLYFLUOROALKYL SUBSTANCES IN FISH FROM AN AFFF-IMPACTED WATERWAY

Nilsen, E., D. Muensterman, L. Carini, I. Waite, S. Payne, J.A. Field, J. Peterson, D. Hafley, D. Farrer, and G.D. Jones. I Science of The Total Environment 906:167798(2023)

A field study was conducted on fish tissues, including largescale sucker (*Catostomus macrocheilus*), goldfish (*Carassius auratus*), and largemouth bass (*Micropterus salmoides*) from three reaches of the Columbia Slough, near Portland International Airport, that have been affected by AFFF and other PFAS sources. Fish blood, liver, and fillet (muscle) were analyzed for target and suspect PFAS by liquid chromatography high-resolution mass spectrometry. Data were analyzed for patterns by fish species, tissue type, and river reach. Thirty-three out of 50 target PFAS and additional suspect compounds were detected at least once during the study at concentrations up to 856 ng/g. Seven carboxylic acids (PFOA, PFNA, PFDA, PFUdA, PFDoA, PFTrDA, PFTeDA), three sulfonates (PFHxS, PFOS, PFDS), three electrofluorination-based compounds (FBSA, FHxSA, FOSA), and two fluorotelomer-based compounds (8:2 FTS, 10:2 FTS) were the most frequently detected in all tissue types. The C6 (PFHxS) to C10 (PFDS) homologs were detected with PFOS and FHxSA at concentrations 1-3 orders of magnitude greater than the other PFAS detected. This is the first report of Cl-PFOS, FPeSA, and FHpSA detected in fish tissue. In all fish samples, fillet concentrations of PFAS were the lowest, followed by liver, and blood concentrations of PFAS were the highest. Differences in PFAS concentrations were driven primarily by tissue types and, to a lesser extent, fish species but weakly by river reach. Measured PFAS concentrations in fish tissues indicate the potential for adverse ecological effects.
https://www.sciencedirect.com/science/article/pii/S0048969723064252/pdfft?md5=250b6baef30e1786fbf34acf0d40e79e&pid=1-s2.0-S0048969723064252-main.pdf

IDENTIFICATION AND ENHANCEMENT OF NATURALLY-OCCURRING IN-SITU AEROBIC BIODEGRADATION OF 1,4-DIOXANE

Diller, K. I DCHWS West 2023 Fall Symposium, 25-27 October, Denver, CO, 23 slides, 2023

Shallow groundwater (~ 3 ft bgs) was impacted by chlorinated solvents and 1,4-dioxane (up to 60,000 µg/L) at a former warehouse from wastewater discharges to a septic tank and associated leach field. A phytoremediation pilot study and source mass removal activities reduced 1,4-dioxane concentrations to 11,000 µg/L; an expansion of the pilot test was needed to further reduce 1,4-dioxane concentrations and the degree of contaminant mass flux reduction at the property line. Natural attenuation processes were examined to help develop additional remedial options, and a data gap investigation was performed. The naturally occurring microbial population, likely *Pseudonocardia dioxanivorans* BERK-1, in the aquifer can degrade 1,4-dioxane in situ if sufficient oxygen is present (where dissolved oxygen [DO] is > ~1 mg/L). Results of the data gap investigation provided evidence that naturally occurring aerobic microbiological destruction of 1,4-dioxane is occurring in the shallow, oxic portion of the aquifer but not in the deeper, anoxic zone. The confirmed relationship between aerobic geochemical conditions and lower 1,4-dioxane concentrations indicated that introducing atmospheric air to the subsurface will increase DO and accelerate 1,4-dioxane destruction. The pilot test expansion included an engineered aeration trench near the source area and a downgradient phytoremediation system. https://mediacdn.guidebook.com/upload/205632/XNT6RGIIbieUetXevyqzP5HCqzhbgedPIQWw.pdf

INVESTIGATION OF THERMAL DESORPTION CHARACTERISTICS AND PILOT-SCALE STUDY OF POLYCYCLIC AROMATIC HYDROCARBONS (PAHS)-CONTAMINATED SOIL DURING CEMENT MANUFACTURING

Li, Y.-M., Y.-C. Wang, H.-S. Zhang, L. Han, Z. Liu, Y. Liu, L. Huang & J.-Y. Zhan
Journal of Material Cycles and Waste Management 26:1633-1648(2024)

A study encompassed lab-scale thermal desorption experiments and pilot-scale demonstration of PAH-contaminated soil. Lab-scale experiments were conducted to investigate the impacts of thermal temperature and residence time on PAH removal efficiency, residual PAH concentration, and variation in composition profiles of PAHs. At a temperature of 400°C and a residence time of 30 min, the total removal efficiency of PAHs exceeded 99%, with each individual PAH compound exhibiting a removal efficiency > 97%. A temperature of 600°C and a residence time of 10 min effectively detoxified PAH-contaminated soil, satisfying the requirements outlined in the DB11/T 811-2011 standard. Increasing the thermal desorption temperature and residence time resulted in higher total removal efficiency of PAHs and lower residual concentrations. During the pilot-scale demonstration, disposal of PAH-contaminated soil led to increased alkali material concentrations and decreased sulfur and chlorine concentrations. Minor coating probability had only a slight impact on the operating conditions of the cement kiln. The impact of PAH-contaminated soil disposal on air pollutant emissions, compressive and flexural strengths, water demand for normal consistency, and soundness may be deemed insignificant.

Research

ROLE OF NITROGENOUS FUNCTIONAL GROUP IDENTITY IN ACCELERATING 1,2,3-TRICHLOROPROPANE DEGRADATION BY PYROGENIC CARBONACEOUS MATTER (PCM) AND SULFIDE USING PCM-LIKE POLYMERS

Cao, H., J. Mao, P.G. Tratnyek, and W. Xu.
Environmental Science & Technology 58(24):10752-10763(2024)

Pyrogenic carbonaceous matter (PCM)-like polymers (PLPs) with controlled nitrogenous functional group placement (quaternary ammonium [QA], pyridine, and pyridinium cations [py$^+$]) were used as model systems to investigate PCM-enhanced trichloropropane (TCP) degradation by sulfide. PLP-QA and PLP-py$^+$ were highly effective in facilitating TCP dechlorination by sulfide with half-lives of 16.91 ± 1.17 and 0.98 ± 0.15 days, respectively. Reactivity increased with surface nitrogenous group density. A two-step process was proposed for TCP dechlorination, initiated by reductive β-elimination, followed by nucleophilic substitution by surface-bound sulfur nucleophiles. TCP degradation kinetics were not significantly affected by co-contaminants (i.e., 1,1,1-trichloroethane or trichloroethylene), but were slowed by natural organic matter. Results show that PLPs containing certain nitrogen functional groups can facilitate rapid and complete TCP degradation by sulfide. This suggests that similarly functionalized PCM might form the basis for a novel process to remediate TCP-contaminated groundwater.

IN-SITU GROUNDWATER REMEDIATION OF CONTAMINANT MIXTURE OF AS(III), CR(VI), AND SULFANILAMIDE VIA ELECTROCHEMICAL DEGRADATION/TRANSFORMATION USING PYRITE

Kim, J.-G., S Sarrouf, M. Fahad Ehsan, A.N. Alshawabkeh, and K. Baek.
Journal of Hazardous Materials 473:134648(2024)

An investigation aimed to study the feasibility of electrochemical advanced oxidation processes (EAOPs) and pyrite to effectively remove a mixture of arsenic (As [III]), Cr VI, and sulfanilamide in groundwater. A comparison of three systems was conducted: (1) EAOP alone, (2) pyrite alone, and (3) a combined EAOP and pyrite system. In EAOP alone, sulfanilamide was effectively oxidized (80%), while the electrochemical transformation of As(III)/Cr(VI) into As(V)/Cr(III) was limited. In just the pyrite system, As(III), Cr(VI), and sulfanilamide were adsorbed onto the surface of pyrite (60%, 20%, and 18%). Neither the EAOP nor the pyrite system alone could effectively treat the contaminant mixture. The combined system completely removed As(III), Cr(VI), and sulfanilamide by the synergistic reaction, which was potentially attributed to the formation of green rust. The system harmonized the combined approach of EAOP and pyrite to effectively eliminate both organic and inorganic contaminants.

USING *L. MINOR* AND *C. ELEGANS* TO ASSESS THE ECOTOXICITY OF REAL-LIFE CONTAMINATED SOIL SAMPLES AND THEIR REMEDIATION BY CLAY- AND CARBON-BASED SORBENTS

Rivenbark, K.J., L.S. Fawkes, H. Nikkhah, M.C. Wang, G.T. Sansom, B. Beykal, T.L. Wade and T.D. Phillips.
Environmental Pollution 347:123762(2024)

A study aimed to determine the efficacy of activated carbons and clay materials in decreasing the bioavailability of chemicals in soil and environmental toxicity *in vitro*. Two ecotoxicological models (*Lemna minor* and *Caenorhabditis elegans*) were used to test residential soil samples with an average of 5.3 (PAHs), 262 (lead), and 9.6 (mercury) ppm for potential toxicity. Toxicity testing indicated that 86% and 58% of soils caused ≤ 50% inhibition of growth and survival of *L. minor* and *C. elegans*, respectively. Three soil samples caused ≥ 90% inhibition of growth in both models, and the toxicity was positively correlated with levels of heavy metals. The toxic soil samples were prioritized for remediation using activated carbon and SM-Tyrosine sorbents. Low levels of SM-Tyrosine protected the growth and survival of *L. minor* and *C. elegans* by 83% and 78%, respectively, from the contaminated soil samples, while activated carbon offered no significant protection. Results also indicated that heavy metals were the driver of toxicity in the samples. Results highlight the applicability of these ecotoxicological models as rapid screening tools for monitoring soil quality and verifying the efficacy of remediation practices.

RESEARCH BRIEF 353: ENGINEERING HYDROGEL BEADS TO ENHANCE BIOREMEDIATION OF GROUNDWATER CONTAMINANT

National Institute of Environmental Health Sciences (NIEHS) Superfund Research Program (SRP), May 2024

SRP-funded scientists and engineers developed an approach to cleaning polluted groundwater that uses tiny beads containing chemical-eating bacteria. The researchers sought to improve upon a treatment system they previously developed by creating and testing hydrogel beads made with different rations of synthetic polymer and alginate, a natural polymer produced by brown seaweed. Through statistical mathematical modeling, the team identified a formula to maximize bead durability and bioremediation or the removal of contaminants using bacteria.
https://tools.niehs.nih.gov/srp/researchbriefs/view.cfm?Brief_ID=353

COMPARING SINGLE AND MULTIPLE OBJECTIVE CONSTRAINED OPTIMIZATION ALGORITHMS FOR TUNING A GROUNDWATER REMEDIATION SYSTEM

Fienen, M.N., N.T. Corson-Dosch, K.L. Jahn, and J.T. White.
Environmental Modelling & Software 173:105952(2023)

Groundwater flow and particle tracking models, Sequential Linear Programming (SLP) and Nondominated Sorting Genetic Algorithm (NSGA-II) were explored at a contaminated site in Long Island and the resulting algorithms and ramifications were compared. NSGA-II explores, at additional computational cost, explicit tradeoffs among multiple objectives, providing additional insights relative to SLP. The NGSA-II algorithm allows for a graphical consideration of three objectives. SLP decision variables often settle at predetermined bounds. Bounds assignment thus differs from parameter estimation; bounds must be acceptable rather than safeguards.

ADVANCED OXIDATION PROCESSES MAY TRANSFORM UNKNOWN PFAS IN GROUNDWATER INTO KNOWN PRODUCTS

Ersan, M.S., B. Wang, M.S. Wong, and P. Westerhoff. Chemosphere 349:140865(2023)

A study aimed to (1) screen selected commercially available advanced oxidation processes (AOPs) (UV, UV + H_2O_2, O_3/H_2O_2) and UV photocatalysis in a pilot system using TiO2 and boron nitride to remove PFAS contaminants and (2) evaluate their role on the conversion of non-detected/unknown to known PFAS compounds in groundwater used as drinking water supplies. Results indicated that while AOPs have the potential to achieve removal of EPA method 533 target PFAS compounds (PFDA [100%], PFNA [100%], PFOA [85-94%], PFOS [25-100%], PFHxS [3-100%], PFPeS [100%], PFBS [100%]), they transformed non-detected/unknown longer-chain PFAS compounds to detectable shorter-chain ones under very high-dose AOP operating conditions. This led to an increase in ΣPFAS concentrations ranging from 95% to 340%. As emerging PFAS treatment processes transition from lab-scale investigations of target PFAS to pilot testing of real water matrices, studies will need to consider the impact of the presence of non-target long-chain PFAS to transform into targeted PFAS compounds.

COMBINING PASSIVE SAMPLING AND DOSING TO UNRAVEL THE CONTRIBUTION OF HYDROPHOBIC ORGANIC CONTAMINANTS TO SEDIMENT ECOTOXICITY

Wieringa, N., S.T.J. Droge, T.L. Ter Laak, A.A.K. Nair, K. Walker, P.F.M. Verdonschot, and M.H.S. Kraak. Environmental Science & Technology 58(1):269-279(2024)

A study aimed to isolate the effects of hydrophobic organic contaminants from other (non)chemical stressors in contaminated sediments using a newly developed passive sampling-passive dosing (PSPD) test. Equilibrium partitioning between pesticides or polyaromatic hydrocarbons (PAHs) in contaminated sediments and a silicone rubber (SR) passive sampler was achieved after 1-3 days. Chlorpyrifos concentrations in pore water of spiked sediment matched very well with concentrations released from the SR into an aqueous test medium, showing that SR can serve as a passive dosing device. A 96 h PSPD lab bioassay with nonbiting midge (*Chironomus riparius*) larvae to field-collected sediments showed that concentrations of the hydrophobic organic contaminant mixtures were high enough to affect the test organisms at two locations. The developed PSPD test isolated the effects of hydrophobic organic contaminants and provided a promising simplified building block for a suite of PSPD tests that, after further validation, could be used to unravel the contribution of hydrophobic organic chemicals to sediment ecotoxicity.

General News

PROCEEDINGS OF THE 2023 NATIONAL FORUM ON CONTAMINANTS IN FISH

EPA Office of Water, EPA 820-R-23-006, 120 pp, 2023

Representatives of states, U.S. territories, tribes, federal agencies, local governments, environmental advocacy groups, utilities, academia, consultants, and nongovernmental organizations, and others virtually attended the 2023 National Forum on Contaminants in Fish, sponsored by EPA. The agenda was developed to provide a variety of perspectives and approaches to assessing and communicating public health risks associated with contaminated fish consumption. Topics included:

- Fish Consumption Advisories
- PFAS Toxicity Assessments
- Beyond PFOS: What's in the fish? Why does it matter?
- PFAS in Commercial Fish
- PFAS Monitoring Studies
- Risk Communication for PFAS
- PFAS: It's Not Just in Finfish
- PFAS Research: Developmental, Reproductive and Neural Effects
- Fish Consumption and Equity
- Risk Communication
- Fish Data Tools
- Climate Change
- Contaminants in Fish

This document contains the proceedings of the Forum, including the agenda, abstracts of presentations and biosketches of presenters and moderators.
https://www.epa.gov/system/files/documents/2023-06/2023proceedings.pdf

SOIL REMEDIATION SCIENCE AND TECHNOLOGY

Ortega-Calvo, J.J. and F. Coulon. (eds.) Springer Cham. Hardcover ISBN 978-3-031-60191-0, Softcover ISBN 978-3-031-60194-1, eBook ISBN 978-3-031-60192-7, 429 99, 2024

This book reviews the latest advances in soil remediation and provides an authoritative account of the environmental chemistry, microbiology, ecotoxicology, and regulation policies of soil pollution. The book also discusses possible pathways for innovation by incorporating state-of-the-art knowledge on sustainability, nature-based solutions, and socio-economical aspects.
https://link.springer.com/book/10.1007/978-3-031-60192-7

LONG-TERM MANAGEMENT OF PFAS CONTAMINATED WATER USING CONSTRUCTED FLOATING WETLANDS: OPPORTUNITIES, LIMITATIONS, AND IMPLEMENTATION CONSIDERATIONS

Award, J., D. Navarro, J. Kirby, C. Walker, and A. Juhasz.
Critical Reviews In Environmental Science And Technology [published online 7 June 2024 before print]

The long-term management of PFAS using constructed floating wetlands (CFW) as a sustainable approach for contaminated water treatment is examined in this review. CFW that feature buoyant platforms to support vegetation show promise in mitigating PFAS contamination through a range of natural processes such as plant uptake, sorption to growth media, and accumulation in biofilms. The review explores CFW opportunities, emphasizing their suitability for installation in existing urban environments with minimal earthwork and drainage adjustments to address PFAS contamination. It also assesses CFW limitations, highlighting the need for comprehensive studies on PFAS fate and transport within these systems. To ensure CFW efficiency in long-term PFAS management, the review highlights the importance of site-specific assessments, including plant species selection, hydrodynamics, and PFAS-microbial community interactions.
https://www.tandfonline.com/doi/epdf/10.1080/10643389.2024.2360762?needAccess=true

REVIEW ON RESEARCH AND APPLICATION OF ENHANCED IN-SITU BIOREMEDIATION AGENTS FOR ORGANIC POLLUTION REMEDIATION IN GROUNDWATER

Xie, M., X. Zhang, Y. Jing, X. Du, Z. Zhang, and C. Tan. l Water 16(3):456(2024)

The development of different bioremediation agents in lab and commercial settings and case studies were reviewed to assist in the future development and application of different agents. The review classified bioremediation agents into three categories: biological nutrition agents, slow-release agents, and microbial agents. Adding bioremediation agents to contaminated groundwater can improve population density and degradation efficiency for microbial degradation of contaminants. Current studies mainly focus on lab development and experiments, while field tests and remediation effects between different agents are of less concern. Further study may focus on developing new materials, especially coating or loading materials, and systematically evaluating different agents in lab research and onsite experiments to improve the efficiency of in situ organically contaminated groundwater bioremediation.

AVAILABLE AND EMERGING LIQUID TREATMENT TECHNOLOGIES FOR PFASS

DiGuiseppi, W.H., C.J. Newell, G. Carey, P.R. Kulkarni, Z. Xia, J. Stults, T.L. Maher, E.F. Houtz, R. Mora, R. Wice, P.W. Tomiczek III, S.D. Richardson, J. Xiong, J. Hale, J.P. Hnatko, R. McGregor, J.T. McDonough, A. Oka, R. Thomas, J. Fenstermacher, and J. Hatton.
Remediation 34(3):e21782(2024)

This article addresses liquid technologies for treating PFAS. The challenge of identifying and evaluating available and emerging liquid treatment technologies was discussed at the PFAS Experts Symposium, which PFAS professionals and subject matter experts attended with a broad range of backgrounds. Discussions covered various technical approaches and led to this manuscript. This article summarizes modern technical approaches that potentially apply to managing liquid media at PFAS-impacted sites and presents current applications to evaluate each technology for their particular use. This article is not intended to guide the site-specific design of treatment systems, but instead to update earlier articles from this group and others addressing PFAS treatment technologies and related PFAS topics.

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 or (703) 603-9915 with any comments, suggestions, or corrections.

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