Technology Innovation News Survey

Entries for September 16-30, 2021

Market/Commercialization Information

HANFORD INTEGRATED TANK DISPOSITION CONTRACT

U.S. DOE, Environmental Management Consolidated Business Center, Cincinnati, OH.
Contract Opportunities on SAM.gov, Solicitation 89303321REM000084, 2021

This notice presents the Final RFP for the Hanford Integrated Tank Disposition Contract (ITDC), NAICS code 562211. The scope of the ITDC effort involves both tank closure and Waste Treatment Plant (WTP) operations at the Hanford Site. Following the contract transition and implementation period, support services shall include (1) operation of waste treatment plant facilities following completion of hot commissioning; (2) operation of tank farm facilities to optimize closure of all 177 Hanford tanks, including single-shell tank waste remediation and closure; (3) tank-side cesium removal; (4) tank waste pre-treatment, treatment, stabilization, and disposition; (5) design, construction, and operation of transfer facilities to provide compliant transfer routes from SSTs to an appropriate DST farm; (6) analytical laboratory support; (7) waste storage, transportation and disposal; (8) a wide range of core functions; and (9) usage-based services to other Hanford contractors. This is an IDIQ contract under which cost-reimbursement and/or fixed-price Task Orders may be issued. Period of performance: 10/03/2022 to 10/02/2037. See additional details on FedConnect at https://www.fedconnect.net/FedConnect/?doc=89303321REM000084&agency=DOE. Offers are due by 4:00 PM ET on December 20, 2021. https://beta.sam.gov/opp/680314e26eac45969fbcf7a2877d08ac/view

ENVIRONMENTAL MANAGEMENT NEVADA PROGRAM-PAHUTE MESA PEER REVIEW

Navarro Research & Engineering, Las Vegas, NV.
Contract Opportunities on SAM.gov, Solicitation NEMNV-22-001, 2021

Navarro Research & Engineering Inc., as a prime Contractor to DOE's Office of Environmental Management Nevada Program, seeks proposals to participate on an expert peer review panel tasked with reviewing the groundwater flow and transport model and associated documentation developed for the Pahute Mesa Corrective Action Unit 101/102 of the Underground Test Area Activity, Nevada National Security Site. The NAICS code is 541620. Offers are due by 2:00 PM ET on December 1, 2021. https://sam.gov/opp/e1dd8ea5688e4abfadb425d4d4d958da/view

STRATEGIC ENVIRONMENTAL RESEARCH AND DEVELOPMENT PROGRAM (SERDP): CORE BAA

U.S. Army Corps of Engineers, Humphreys Engineer Center Support Activity, Alexandria, VA.
Contract Opportunities on SAM.gov, Solicitation W912HQ22S0001, 2021

This notice constitutes a Broad Agency Announcement to declare DoD SERDP's intent to competitively fund R&D for environmental research that addresses the statements of need in the areas of environmental restoration, munitions response, resource conservation and resiliency, and weapons systems and platforms technologies for projects to be funded in FY 2023. Thirteen Statements of Need are posted on the SERDP website at https://www.serdp-estcp.org/Funding-Opportunities/SERDP-Solicitations/Core-SONs, including ERSON-23-C1 - Transformation of Polyfluoroalkyl Substances Found in Soil and Groundwater at AFFF-Impacted Sites; ERSON-23-C4 - Attenuation Mechanisms and Degradation Kinetics of Minor Components of Common Groundwater Contaminant Mixtures; and MRSON-23-C1 - Detection, Localization, Classification, and Remediation of Military Munitions Underwater. The NAICS code is 541715. Depending upon the quality of proposals received and availability of funds, multiple awards totaling about $10M are anticipated. To be eligible for consideration, those wishing to respond to this announcement must submit a pre-proposal by 2:00 PM ET on January 6, 2022. An online seminar -- SERDP Funding Opportunities - FY 2023 -- will be conducted on November 10, 2021, from 1:00-2:30 PM ET. https://sam.gov/opp/25868f63aa7b4b34a2867458ad3a49f1/view

STRATEGIC ENVIRONMENTAL RESEARCH AND DEVELOPMENT PROGRAM (SERDP): SEED BAA

U.S. Army Corps of Engineers, Humphreys Engineer Center Support Activity, Alexandria, VA.
Contract Opportunities on SAM.gov, Solicitation W912HQ22S0002, 2021

This notice constitutes a Broad Agency Announcement to declare DoD SERDP's intent to competitively fund R&D projects to establish proof of concept for innovative environmental technologies and methods in environmental restoration, munitions response, resource conservation and resiliency, and weapons systems and platforms technologies for projects to be funded in FY 2023. These projects will be funded with firm-fixed-price contracts at a level not to exceed the simplified acquisition threshold of $250,000 in total costs, and projects should be no more than about one year in duration. The SERDP Exploratory Development area of need is MRSEED-23-S1 - Detection, Localization, Classification, and Remediation of Military Munitions Underwater, for which details are posted at https://www.serdp-estcp.org/Funding-Opportunities/SERDP-Solicitations/SEED-SONs/MRSEED-23-S1-Detection-Localization-Classification-and-Remediation-of-Military-Munitions-Underwater. To be eligible for consideration, proposals prepared in accordance with instructions provided on the SERDP website must be received by 2:00 PM ET on March 10, 2022. https://sam.gov/opp/ac143588a0474be3aed04317101cbc62/view

Cleanup News

SUSTAINABLE PFAS RESIN TECHNOLOGY APPLIED AT MULTIPLE LOCATIONS FOR MILITARY BASE AQUIFER REMEDIATION

Newman, P. I REMTECH 2021: The Remediation Technologies Symposium, Banff, AB, Canada, 13-15 October, 27 slides, 2021

Regenerable ion exchange (IX) resin treatment systems were installed to remove PFAS at two pump and treat systems and a stormwater treatment system at the Royal Australian Air Force (RAAF) Base Williamtown in Australia. Minimal waste is generated, primarily because the spent resin is regenerated onsite. Programmable logic control systems installed on these treatments systems facilitate seamless transition between extraction wells and treated water discharge methods, ensuring maximum reduction in groundwater contamination while operating 24/7. The approach has proven to be an effective, efficient, sustainable approach to removing PFAS and achieving consistent compliance with project objectives. The considerable reduction in waste generation, storage, and thermal destruction has positively impacted the environment. The lessons learned to date have largely centered on optimization of the pretreatment processes and resin regeneration system. https://esaa.org/wp-content/uploads/2021/10/RT21-Newman.pdf
More information on the system: https://www.defence.gov.au/environment/pfas/williamtown/managementactivities.asp.

LOW-INTENSITY ELECTROCHEMICAL REDOX REACTIONS FOR CONTAMINANT REMEDIATION IN CLAY & SILT MATRICES

Jin, S. I Colorado Environmental Management Society Webinar, virtual, 10 November, 69 minutes, 2021

This presentation focuses on field case studies (brownfield projects) using the low-intensity electrochemical redox reactions for in situ treatment of PCE and TCE in the subsurface dominated by clay and silts. Low-intensity electrochemical redox reactions achieve multiple electrochemical reactions in the contaminated matrix, including 1) direct and fast reductive dechlorination of chlorinated solvents through the beta elimination pathway that does not generate chlorinated ethene intermediates, 2) alteration of the solid-water interface to enhance desorption of contaminants, 3) lowering redox potential rapidly in the matrix, which favors biological reductive dechlorination and extends longevity of other electron-donating compounds; and 4) synergy with other remedial technologies. Field data suggest that this new method could help achieve cost-effective compliance goals, especially in an otherwise challenging tight formation.
https://www.gotostage.com/channel/32cea236cdfe49b2ade7fe267e5dfdfd/recording/d0b806144d3e4f46a0a6a1cc5952de76/watch?source=CHANNEL

NEW INTEGRATED BIOCHEMICAL / ELECTROCHEMICAL METHOD FOR REMEDIATION OF CONTAMINATED GROUND WATER

Lizer, T. I RemTech Europe 2020: European Conference on Remediation Market and Technologies, 21-25 September, virtual, 16 slides, 2020

Electro Bioremediation (EBR®) uses subsurface electrodes with high catalytic activity to generate O_2, which is constantly reduced to H_2O_2. An additional electrode is used as a constant source of Fe cations via forced corrosion and effective Fe_2+ formation from Fe_3+. Successful implementation of EBR at several sites has resulted in rapid site closure. For example, a study conducted in Israel found that the electrolysis system induced rapid change in the biochemical conditions. Anaerobic wells rapidly turned aerobic. As a result, a significant decrease in MTBE concentrations (from 68 mg/L to 96% of the MTBE underwent oxidative destruction. Similar results from various full-scale remediation projects are presented, along with information on cost and processing. Non-uniform electrokinetics via a polarity exchange technique to prevent significant pH changes are also presented. Potential applications for other contaminants under various site conditions (deep aquifer, fractured rock, etc.) are discussed. http://www.remtechexpo.com/images/speeches2020/Troy-Lizer.pdf

RECORD OF DECISION QUENDALL TERMINALS SUPERFUND SITE OPERABLE UNITS 1 AND 2 RENTON, WASHINGTON

EPA Region 10, 247 pp, 2020

EPA selected in situ smoldering combustion and/or in situ solidification (ISS) of dense nonaqueous phase liquid (DNAPL) and soil capping as the remedy for OU1, the upland part of the site. EPA selected DNAPL removal, engineered sand cap, and enhanced natural recovery as the remedy for OU2, the offshore part of the site. https://semspub.epa.gov/work/10/100255708.pdf
Also see public announcement of ROD: https://www.epa.gov/newsreleases/epa-releases-final-plan-quendall-terminals-cleanup

REMEDIATION OF A CHLORINATED SOLVENT SOURCE AREA THROUGH EXCAVATION AND ISCO IN THE UNSATURATED ZONE AT A FORMER INDUSTRIAL SITE IN SÃO PAULO, BRAZIL

Daele, G.V.D., J. Cury, G. Garcia, A. Cervelin, and G. De Mello.
RemTech Europe 2020: European Conference on Remediation Market and Technologies, 21-25 September, virtual, 18 slides, 2020

A source zone remediation strategy is described to treat contamination in the unsaturated zone resulting from an underground storage tank containing PCE. The treatment train strategy includes removing underground structures, excavating contaminated soil, ISCO to ~10m bgs, and SVE to extract residual mass. ISCO was conducted using sodium persulfate activated by chelated iron (Fe EDTA). Subsequent soil sampling showed reductions in PCE concentrations exceeding 95%. ISCO using nano-bubbles of ozone and persulfate in the unsaturated and saturated zones is planned. Lessons learned are described. http://www.remtechexpo.com/images/speeches2020/Gerd-Van-Den-Daele.pdf

Demonstrations / Feasibility Studies

NEW FUEL RECOVERY TECHNIQUE TESTED AT EDWARDS AIR FORCE BASE, SITE 31, FORMER BULK FUEL STORAGE FACILITY

Poach, A.
California Regional Water Quality Control Board, Lahontan Region, Meeting of September 16, 2020. p 17-19, 2020

Since December 2013, Edwards AFB has recovered ~3,500 gals of LNAPL from the subsurface of Site 31 using manual bailing/pumping and dedicated XiTech® product recovery pumps. Despite these efforts, several groundwater monitoring wells still have measurable LNAPL (up to 4.63 ft of apparent thickness in March 2020). In June 2020, the Air Force began pilot-testing two nonaqueous extraction technique (NET™) systems at Site 31 to enhance LNAPL recovery. The process utilizes an oleophilic/hydrophobic fabric capable of adsorbing the product with 99% recovery efficiency. The process is effective for both LNAPL and DNAPL. The fabric, which resembles bristles on a broom, is conveyed in a continuous loop into the well to intercept the oil-water interface. The product is adsorbed as the fabric travels through the interface and then is removed in a specially designed desorption unit. The recovered product is gravity-drained into a storage drum or tank. The mobile systems are mounted on small utility trailers and are powered by a solar panel and batteries. Recovered LNAPL is transferred to the base hazardous waste facility for proper disposal or recycling. The Air Force is testing the NET systems at four wells, and the pilot study is scheduled to continue for 12 months. Photos of the equipment on site are provided.See ***pages 5-21 through 5-23:***
https://www.waterboards.ca.gov/lahontan/board_info/agenda/2020/sep/item5.pdf

APPLICATION OF PFAS-MOBILE LAB TO SUPPORT ADAPTIVE CHARACTERIZATION AND FLUX-BASED CONCEPTUAL SITE MODELS AT AFFF RELEASES

Quinnan, J., M. Rossi, P. Curry, M. Lupo, M. Miller, H. Korb, C. Orth, and K. Hasbrouck.
Remediation 31(3):7-26(2021)

Two aspects of an ESTCP demonstration that were conducted at Camp Grayling Army Airfield in Grayling, Michigan, are presented (https://serdp-estcp.org/Program-Areas/Environmental-Restoration/Contaminated-Groundwater/Emerging-Issues/ER19-5203). The objective was to demonstrate the value of adaptive high-resolution PFAS site characterization using a quantitative screening method that is selective for PFAS compounds and sensitive across the range of concentrations between screening levels at 40 ng/L and source impacts within the mg/L range. The method's reliability was demonstrated using sample pair comparability statistics with an Environmental Laboratory Accreditation Program-certified lab, visual interpretation of characterization and relative flux, and comparison of contaminant mass discharge calculated at flux transects. In addition, the study measured vadose zone source strength using soil to groundwater concentration ratios, lysimeter porewater sample analysis, and synthetic precipitation leaching procedure testing. Results demonstrated that using the mobile lab and the stratigraphic flux approach can distinguish individual PFAS sources, visually map PFOA and PFOS and migration pathways, and provide an efficient means of ranking source contributions to plumes. *See ESTCP Final Report on mobile lab project:* https://www.serdp-estcp.org/content/download/54083/531101/file/ER19-5203%20Final%20Report.pdf

FIELD TRIAL DEMONSTRATING PHYTOREMEDIATION OF THE MILITARY EXPLOSIVE RDX BY XPLA/XPLB-EXPRESSING SWITCHGRASS

Cary, T.J., E.L. Rylott, L. Zhang, R.M. Routsong, A.J. Palazzo, S.E. Strand, and N.C. Bruce.
Nature Biotechnology (2021)

Previous lab studies showed that thale cress (*Arabidopsis thaliana*) engineered to express *xplA* and *xplB* genes encoded with RDX-degrading enzymes from the soil bacterium *Rhodococcus rhodochrous* 11Y can break down RDX. This study reports the results of a three-year field trial using xplA/xplB-expressing switchgrass (*Panicum virgatum*) to detoxify RDX at three locations on a military site. Data suggests that *xplA/xplB* switchgrass has in situ efficacy, with potential utility for detoxifying RDX on live-fire training ranges, munitions dumps, and minefields.

APPLICATIONS OF ANAEROBIC PETROLEUM HYDROCARBON BIOREMEDIATION

Roberts. J., C.R.A. Toth, S. Guo, N. Bawa, S. Dworatzek, J. Webb, R. Peters, K. Bradshaw, E.A. Edwards, K. Stevenson, C. McGarvey, and A. Wang.
REMTECH 2021: The Remediation Technologies Symposium, Banff, AB, Canada, 13-15 October, 34 slides, 2021

Recent advancements in molecular genomics have identified microorganisms responsible for anaerobic benzene, toluene, and xylene (BTX) transformation, which has been commercialized into an anaerobic BTX culture (DGG™ Plus). DGG Plus is a blend of three separately grown cultures consisting of prokaryotic Bacteria and Archaea. Laboratory treatability studies demonstrated that bioaugmentation promoted enhanced benzene biodegradation rates and provided information to aid in field pilot-test design. One field pilot test performed in November 2019 at a site in Saskatchewan included three injection points, two of which received up to 10 L of DGG Plus. A third injection point received a killed culture (control) to rule out if dead cells or media components can promote benzene degradation. It is anticipated that benzene degradation rates will be accelerated in situ through bioaugmentation as observed in corresponding treatability studies. Two additional field applications with an anaerobic culture for bioremediation of benzene (DGG-B™) and one field injection with DGG Plus are also being monitored. These first-to-field projects using novel bioaugmentation cultures may provide a better understanding of dosing requirements, timeframes for obtaining results, and ranges of conditions over which the cultures are effective. https://esaa.org/wp-content/uploads/2021/10/RT21-Roberts2.pdf

Research

PHYTOEXTRACTION EFFICIENCY OF ARABIDOPSIS HALLERI IS DRIVEN BY THE PLANT AND NOT BY SOIL METAL CONCENTRATION

Dietrich, C.C., S. Tandy, K. Murawska-Wlodarczyk, A. Banas, U. Korzeniak, B. Seget, and A. Babst-Kostecka. Chemosphere 285:131437(2021)

This study evaluated the potential for soil metal-bioavailability to predict trace metal element (TME) accumulation in two non-metallicolous and two metallicolous populations of the Zn/Cd hyperaccumulator *Arabidopsis helleri* to better forecast the outcome of future phytoremediation efforts. The study also examined the relationship between a population's habitat and its phytoextraction efficiency. Shoot TME accumulation varied independently from both total and bioavailable soil TME concentrations in metallicolous individuals. Hyperaccumulation patterns appeared more plant- and less soil-driven: one non-metallicolous population proved to be as efficient in accumulating Zn on non-polluted soil as the metallicolous populations in their highly contaminated environment. Findings demonstrated that in-situ information on plant phytoextraction efficiency is indispensable to optimize site-specific phytoremediation measures. If successful, hyperaccumulating plant biomass may provide valuable source material for application in the emerging field of green chemistry.

INTEGRATING THERMAL ANALYSIS AND REACTION MODELING FOR RATIONAL DESIGN OF PYROLYTIC PROCESSES TO REMEDIATE SOILS CONTAMINATED WITH HEAVY CRUDE OIL

Gao, Y., P. Dias Da Silva, P.J.J Alvarez, and K. Zygourakis.
Environmental Science & Technology 55(17):11987-11996(2021)

A novel methodology combining thermo-analytical measurements and mathematical methods was developed to inform the reliable pyrolytic treatment of specific soil/contaminant systems. The approach improves open current "black-box" design methods that may overestimate the required treatment intensity and hinder cost efficacy. Thermogravimetry and evolved gas analysis were used to characterize the complex network of soil mineral transformations, contaminant desorption, and pyrolytic reactions that occur when contaminated soils are heated in an anoxic atmosphere. The kinetics of the reactions were quantified and used in a mathematical model for continuous-flow reactors to predict the removal of hydrocarbon contaminants without other fitting parameters. The model was tested with pilot-scale data from pyrolytic treatment of soils contaminated with crude oil and was a good predictor of TPH removal for temperatures between 370 and 470°C and residence times from 15 to 60 min. The light hydrocarbon fraction desorbed quickly, and >99.7% removal was achieved at 420°C and 15 min residence time. However, 95% removal of the heavy hydrocarbon fraction, which is a good proxy for PAHs, required 470°C with 15 min residence time. This model can be employed to select operating conditions to reliably achieve remediation objectives for specific hydrocarbon/soil mixtures without inflating energy requirements, which may lower operating costs and decrease the process carbon footprint on a system-specific basis.

IDEAL VERSUS NONIDEAL TRANSPORT OF PFAS IN UNSATURATED POROUS MEDIA

Brusseau, M.L., B. Guo, D.D. Huang, N. Yan, and Y. Lyu.
Water Research 202:117405(2021)

This study investigated the influence of surfactant-induced flow and nonlinear air-water interfacial adsorption (AWIA) on PFAS transport with a series of miscible-displacement transport experiments conducted with a several-log range of input concentrations. PFOS, PFOA, and GenX were used as model PFAS. Results were interpreted in terms of critical reference concentrations associated with PFAS surface activities and their relationship to the relevancy of transport processes, such as surfactant-induced flow and nonlinear AWIA, for concentration ranges of interest. Analysis of the measured transport behavior of PFAS under unsaturated-flow conditions demonstrated that AWIA was linear when the input concentration was sufficiently below the critical reference concentration. PFAS retention associated with AWIA can be ideal when the input concentration is sufficiently below the critical reference concentration, supporting simplified mathematical models. Conversely, apparent nonideal transport behavior was observed for experiments conducted with input concentrations similar to or greater than the critical reference concentration.

DIRECT INJECTION ANALYSIS OF PER AND POLYFLUOROALKYL SUBSTANCES IN SURFACE AND DRINKING WATER BY SAMPLE FILTRATION AND LIQUID CHROMATOGRAPHY-TANDEM MASS SPECTROMETRY

Mottaleb, M.A., Q.X. Ding, K.G. Pennell, E.N. Haynes, and A.J. Morris.
Journal of Chromatography A 1653:462426

A method to determine PFAS in tap water and surface water samples was developed and validated without prior sample concentration. Samples were centrifuged, and supernatants were passed through an Acrodisc Filter (GXF/GHP 0.2 um, 25 mm diameter). After adding ammonium acetate, samples were analyzed by UPLC-MS/MS using a mass spectrometer operated in negative multiple reaction-monitoring mode. The instrument system incorporated a delay column between the pumps and autosampler to mitigate interference from background PFAS. The method monitors eight short-/long-chain PFAS, identified by their specific precursor product ion pairs and retention times, and quantified using isotope mass-labeled internal standard calibration plots. Average spiked recoveries of target analytes ranged from 84-110% with 4-9% relative standard deviation (RSD). The mean spiked recoveries of four surrogates were 94-106% with 3-8% RSD. For continuous calibration verification, average spiked recoveries for target analytes ranged from 88-114% with 4-11% RSD, and surrogates ranged from 104-112% with 3-11% RSD. The recoveries (n = 6) of matrix spike, matrix spike duplicate, and field reagent blank met acceptance criteria. The limit of detection for the target analytes ranged from 0.007-0.04 ng/mL.

SMALL-SCALE THERMAL TREATMENT OF INVESTIGATION-DERIVED WASTES (IDW) CONTAINING PER- AND POLYFLUOROALKYL SUBSTANCES (PFAS)

Koster van Groos, P.G. SERDP Project ER18-1556, 693 pp, 2021

The focus of this project was to develop a better understanding of PFAS fate associated with lower temperature (below 600°C) thermal treatment approaches. This included an effort to assess the potential benefit of $Ca(OH)_2$ amendments for lowering PFAS decomposition temperatures and off-gassing of volatile organic fluorine (VOF) species. Various thermal decomposition products were examined, including fluoride mineralized from the PFAS, sulfur oxyanions, and VOF species that evolved. https://www.serdp-estcp.org/content/download/53797/528483/file/ER18-1556%20Final%20Report.pdf

THE EFFECT OF IN-SITU ACTIVATED CARBON ON BIODEGRADATION OF TCE

Harigovind, S. Master's Thesis, Clemson University, 100 pp, 2020

Research investigated in-situ activated carbon (AC) and its ability to act as an adsorbent to attract contaminants and bacteria onto itself and as a bridge to easily transfer electrons between microorganisms and chlorinated compounds. Experiments were conducted using 11 batches of triplicates with either emulsified oil substrate or a mixture of acetate-lactate as electron donors. AC mass loadings included 78 mg/mL (high), 26 mg/mL (medium), and 1 mg/mL (low). The remaining were control batches consisting of AC unamended batches, batches unamended with electron donors, and a sterile batch. A gas chromatograph was used to analyze the batches' headspace samples to detect the amount of TCE, its daughter products, and methane present denoted as µmole/bottle. A separate enrichment experiment was conducted using bacteria from the control and 1 mg/mL GAC batches. Inoculum was subjected to GAC-amended and GAC-unamended environments, with acetate-lactate as the electron donor. https://tigerprints.clemson.edu/cgi/viewcontent.cgi?article=4441&context=all_theses

REMOVAL OF PERCHLORATE BY A LAB-SCALE CONSTRUCTED WETLAND USING ACHIRA (*CANNA INDICA* L.)

Li, D., B. Li, H. Gao, X. Du, J. Qin, H. Li, H. He, and G. Chen.
Wetlands Ecology and Management [Published online 30 August 2021 prior to print]

Constructed wetlands with and without achira (*Canna indica* L.) were used to investigate the efficiency and mechanism of perchlorate (ClO_4^-) removal. Perchlorate removal in the wetlands without achira decreased with time, whereas perchlorate in the wetlands with achira was stably removed and improved the rhizosphere environment. In terms of ClO4- content, the achira tissues were in the descending order of leaf > aerial stem > flower or rhizome > root. Mass balance calculation showed that plant uptake accounted for 5.81-7.34% of initial ClO4- input, while microbial degradation accounted for 29.39-62.48%. The wetlands with achira were favorable for soil microorganism growth and proliferation and, in turn, biodegradation of ClO_4^-. Effluent pH increased in achira wetland columns, promoting the removal of ClO_4^-.

General News

ON PER- AND POLYFLUOROALKYL SUBSTANCES: SUGGESTED RESOURCES AND CONSIDERATIONS FOR GROUNDWATER PROFESSIONALS

Frankel, A.J. I Groundwater 59(4):481-487(2021)

Resources and key considerations are suggested in this article for groundwater professionals wishing to familiarize themselves with PFAS compounds. The article discusses background information, current groundwater-related regulations, risk considerations, and mitigation options. It also compares PFAS to other groundwater contaminants and provides a broad selection of references.

CONSIDERATION OF ECOSYSTEM SERVICES AT CLEANUP SITES: A RETROSPECTIVE ANALYSIS AND ONGOING EPA/ORD RESEARCH

Kravitz, M., M. Harwell, J. Hoffman, and T. Newcomer-Johnson, National Conference on Ecosystem Restoration, 2-5 August, Portland, OR, 17 slides, 2021

This presentation summarizes an EPA Office of Research and Development (ORD) study that provides background information about ES and presents an evaluation framework that could serve to integrate ES consideration into remediation projects across the country. It also summarizes ongoing ORD research focusing on a retrospective analysis of ES and remedial Best Management Practices employed at two sites where remediation has been completed. Examining sites that have been cleaned up will increase understanding of the utility of practices that have worked and those that need to be improved or changed. The analysis is presented in the context of ongoing case studies that examine how ES derived through community input can be used to determine sites amenable to restoration and reuse. https://cfpub.epa.gov/si/si_public_file_download.cfm?p_download_id=543110&Lab=CESER

THE VI DIAGNOSIS TOOLKIT FOR ASSESSING VAPOR INTRUSION PATHWAYS AND IMPACTS IN NEIGHBORHOODS OVERLYING DISSOLVED CHLORINATED SOLVENT PLUMES

Johnson, P.C., Y. Guo, and P. Dahlen. ESTCP Project ER-201501, 525 pp, 2020

The objective of this project was to develop, demonstrate and validate a suite of tools to more accurately, cost-effectively, and confidently assess VI impacts in residential and industrial buildings overlying dilute chlorinated solvent plumes. The project focused on advancing the VI Diagnosis Toolkit, which includes: external VI source screening for at-risk building identification; building-specific controlled pressurization method testing to measure worst-case VI indoor air impacts in at-risk buildings quickly; identification of indoor vapor sources through the use of portable analytical tools; passive samplers for longer-term (week to month duration), time-weighted indoor air concentration measurements; and using the collected data to select appropriate mitigation strategies if needed. https://www.serdp-estcp.org/content/download/54042/530601/file/ER-201501%20Final%20Report.pdf

DEMONSTRATING A BIOGEOPHYSICS STRATEGY FOR MINIMALLY INVASIVE POST REMEDIATION PERFORMANCE ASSESSMENT

Johnson, T.C., F.D. Day-Lewis, L.D. Slater, P. Kessouri, S. Hammett, and D. Ntarlagiannis. ESTCP Project ER 201579-PR, 55 pp, 2020

The primary objectives of this field demonstration were to 1). Identify the long-term geophysical footprint of active bioremediation at a VOC-contaminated site to assess the long-term spatial extent of the altered zone using surface-based geophysical imaging techniques; 2). Determine the significance of the geophysical footprint of solid-phase mineral transformations and/or biofilms induced by the treatment process to interpret biogeochemical impacts of geophysical alterations within the treatment zone; and 3). Demonstrate use of the above objectives to map gradients in the geophysical footprints of biostimulation along a transect crossing the boundary of the treatment area and interpret those gradients in terms of long-term biogeochemical impacts.

TOOLKIT #3 - EVALUATION OF REMEDIATION TECHNOLOGIES FOR PETROLEUM HYDROCARBON SITES

Golder Associates Ltd. For Contaminated Sites Approved Professional Society of British Columbia & Shell Global Solutions, 69 pp, 2021

This document comprises the third of a four-volume set of toolkits developed to provide guidance and improved decision-making for practitioners involved with investigating and remediating petroleum hydrocarbon-contaminated sites. The document describes a science-based approach to identify, screen, and select remedial technologies based on an LNAPL conceptual site model, LNAPL concerns or risks, remedial goals, primary mechanisms and broad objectives, specific remedy criteria, performance metrics, and transition thresholds. https://csapsociety.bc.ca/wp-content/uploads/T3-CSAP-Toolkit-3-Remedial-Technologies-06APR_21.pdf
Toolkit #1: https://csapsociety.bc.ca/wp-content/uploads/Monitored-Natural-Attenuation-Toolkit-for-Evaluation-1-and-2_combined-FINAL-.pdf
Toolkit #2: https://csapsociety.bc.ca/wp-content/uploads/T2-CSAP-MNA-Toolkit-2-Monitoring-Prediction-08JUL_16.pdf

MANAGEMENT OF AFFF IMPACTS IN SUBSURFACE ENVIRONMENTS AND ASSESSMENT OF NOVEL AND COMMERCIALLY AVAILABLE PFAS-FREE FOAMS (PART 1)

Cates, E. and J. Payne. SERDP & ESTCP Webinar Series, Webinar #139, September 2021

On September 9, SERDP and ESTCP sponsored webinars focused on DoD-funded research to manage the impacts of traditional aqueous film-forming foams (AFFF) by destroying PFAS in wastewaters and developing PFAS-free firefighting foams. Specifically, investigators discussed a photocatalytic treatment system to treat PFAS-impacted wastewaters and the physical and chemical processes of PFAS-free firefighting foams that affect performance.
https://www.serdp-estcp.org/Tools-and-Training/Webinar-Series/09-09-2021

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.

Mention of non-EPA documents, presentations, or papers does not constitute a U.S. EPA endorsement of their contents, only an acknowledgment that they exist and may be relevant to the Technology Innovation News Survey audience.