Technology Innovation News Survey

Entries for August 1-15, 2022

Market/Commercialization Information

AQUEOUS FILM FORMING FOAM (AFFF) SUPPORT MATOC- DRAFT SOLICITATION

Contract Opportunities at SAM.gov, Solicitation W912DY23R0001, 2022
U.S. Army Corps of Engineers, W2V6 USA Engineering Support Center, Huntsville, AL

When the solicitation is released, it will be competed as a full and open competition under NAICS code 562910. The U.S. Army Corps of Engineers requires a contractor to remove, transport, and dispose of Aqueous Film Forming Foam (AFFF) containing PFAS. The AFFF will be removed or modified and refilled with a fluorine-free foam based on a military specification (MIL-SPEC) provided at the task order (TO) level. Work may also include removal, transportation, and disposal of other types of firefighting foams. This requirement will be competed on an unrestricted basis with a small business reserve and will result in a Multiple Award Task Order Contract (MATOC). This MATOC will have a base ordering period of twenty-four (24) months with three (3) 12-month option periods. The total shared programmatic capacity for the MATOC is $800 million over five years (if all options are exercised) for this acquisition. Individual capacities will not be assigned to each contract, and Task Orders will be awarded as Firm Fixed Price (FFP). Pricing will be evaluated at the Task Order level. The purpose of this posting and the acceptance of questions is to assist with market research. There will be future opportunities to ask questions and receive answers from the Government. A preproposal conference will be scheduled at a later date. https://sam.gov/opp/a5818d8a67314790a7570c162f51962c/view

ENVIRONMENTAL REMEDIATION SERVICES AT THE DURHAM MANUFACTURING COMPANY SITE IN DURHAM, CONNECTICUT

Contract Opportunities at SAM.gov, Solicitation W912WJ22R0014, 2022
U.S. Army Corps of Engineers, New England District, Concord, MA

When The Solicitation Is Released Sometime in October 2022, it will be competed as a total small business set-aside under NAICS code 562910. The U.S. Army Corps of Engineers intends to issue a solicitation for environmental remediation for the temporary treatment of groundwater and excavation and disposal of soils contaminated with volatile organics at the Durham Meadows Superfund Site in Durham, Connecticut. A Best-Value solicitation is planned for late 2022, and remediation field work is expected to begin in early 2023 and be completed by the end of 2023. Contract Line Items (CLINs) will clearly define separable cost-reimbursable line items for utility work, groundwater treatment, foundation support/restoration, and soil removal. A Best-Value procurement provides an opportunity for offerors to submit their qualifications in writing and the government to select the successful offeror based on how well the submissions meet the source selection criteria listed in the solicitation. No solicitation is currently available. All interested offerors will have the opportunity to respond to the solicitation announcement at a later time. The estimated magnitude of this project is between $5 million and $10 million. https://sam.gov/opp/f3987fdf58f545c2a3417ee8690ff2d8/view

FY 2022 AND FY 2023 REGION 2 SOURCE REDUCTION ASSISTANCE IN COMMUNITIES GRANTS ENVIRONMENTAL PROTECTION AGENCY

Environmental Protection Agency, Funding Opportunity EPA-REG2-LCRD-P2-2022-1, 2022, 2022

Region 2 is announcing a grant competition to fund "Source Reduction Assistance in Communities" assistance agreements that support research, investigation, study, demonstration, outreach, education, and training using source reduction approaches (also known as "pollution prevention" and herein referred to as "P2"). EPA is particularly interested in receiving applications that offer hands-on practical P2 tools, information and/or innovative P2 approaches to measurably improve public health and the surrounding environment, by reducing the use of hazardous substances, reducing toxic pollutants, supporting efficiencies in reducing resource use, and reducing business expenditures and liability costs. Region 2 is interested in receiving applications for community-based projects that are performed in and benefit States or communities within EPA Region 2 (New York, New Jersey, Puerto Rico, U.S. Virgin Islands, and eight federally recognized Indian Nations). Beneficiaries can include, for example: for-profit and not-for-profit businesses, non-profit organizations, cooperatives and worker-owned businesses, local municipal governments, religious organizations, universities/colleges, secondary schools, consortia, and associations. Applicants will need to select at least one of the following technical assistance methods as the primary approach for performing the grant activity: a) research, b) investigation, c) experiments, d) education, e) training, f) studies, and/or g) demonstration of innovative techniques. EPA anticipates award of up to three grants under this announcement with a total combined value of up to $228,000. Federal funding for individual grant awards can range from $70,000 to $228,000. Funding depends upon availability of funds, quality of evaluated applications, Agency priorities, and other applicable considerations. EPA reserves the right to reject all applications and make no awards under this announcement. In addition, EPA reserves the right to make additional awards under this announcement, consistent with Agency policy, if additional funding becomes available after the original selection. Any additional selections for awards will be made no later than six months from the date of the original selection. Eligible applicants include States, the Commonwealth of Puerto Rico, U.S. Virgin Islands, Guam, any territory or possession of the United States, local governments, city or township governments, independent school district governments, state-controlled institutions of higher education, non-profit organizations, (other than institutions of higher education) private institutions of higher education, community-based grass roots organizations, and federally-recognized tribes and intertribal consortia. Submissions are due no later than 11:59 pm ET on November 14.
https://www.grants.gov/web/grants/view-opportunity.html?oppId=343571

Cleanup News

THERMAL DESTRUCTION OF PFAS DURING FULL-SCALE REACTIVATION OF PFAS-LADEN GRANULAR ACTIVATED CARBON

DiStefano, R., T. Feliciano, R.A. Mimna, A.M. Redding, and J. Matthis.
Remediation [Published13 September 2022 before print]

A thorough testing program was carried out at a full-scale granular activated carbon (GAC) reactivation facility during the reactivation of GAC that adsorbed PFAS. The facility employs a multi-hearth Herreschoff furnace and a downstream abatement train that includes a thermal oxidizer, spray quench cooler, dry injection scrubber, and baghouse. All inputs and outputs of the system were tested for targeted PFAS compounds and fluoride (total and as hydrogen fluoride). Under typical operating conditions, the system demonstrated full removal of PFAS compounds from GAC and >99.99% destruction of PFAS compounds through the furnace and abatement system. Additional key findings were that a large portion of the PFAS destruction occurs in the furnace before the thermal oxidizer; the fluoride mass balance was close to 61.4%, and emission levels were significantly lower than available public data for PFAS manufacturing emissions.
https://onlinelibrary.wiley.com/doi/epdf/10.1002/rem.21735

INTEGRATED REMEDY OPTIMIZATION: AN APPROACH FOR HANFORD SITE CENTRAL PLATEAU CLEANUP

Amrhein, K., E. Laija, G. Ruskauff, M. Tonkin, N. Jaschke, S. Springer, and M. Byrnes.
RemPlex 2021 Global Summit on Environmental Remediation Virtual event, 8 November, 229 minutes, 2021

A remedy optimization study was initiated in 2019 within the Central Plateau at the Hanford site to evaluate an increase in removal and treatment capacity for carbon tetrachloride in the 200 West pump and treatment (P&T) system, a transition to monitored natural attenuation (MNA) for nitrate treatment, and to support further optimization efforts. The site presents challenges associated with shallow contaminant sources; persistent and recalcitrant deep vadose zone residual sources; large-scale, comingled groundwater plumes with significant uncertainty in plume distribution and total mass in the aquifer; and subsurface heterogeneity, including both geological and geochemical factors, affecting plume distribution, remedy design (implementation and operational strategies), and the impact on contaminant fate and transport outside the Central Plateau. Since the 200 West P&T operations began, new information that impacts the technical assumptions used to support the final Record of Decision for the 200-ZP-1 OU has emerged. This includes updated estimates of the abiotic degradation rate for carbon tetrachloride and an improved understanding of carbon tetrachloride mass and distribution, which indicates the total mass is greater than the baseline estimate and a greater portion resides in deeper, less transmissive aquifer units. This YouTube session presents information associated with the optimization study in the context of broader Central Plateau cleanup challenges, including EPA's perspective on adaptive management in the Central Plateau, subsurface characterization challenges, optimization strategy for the P&T system, performance monitoring to support uncertainty reduction, expansion of the P&T system to treat other Central Plateau plumes, and integrated remedy decision-making for the Central Plateau. *See* ***times 0:00:00-3:49:00***
https://www.youtube.com/watch?v=E1KidwEjsuA&t=3600s

ANALYSIS OF THE REMEDIATION OF COAL TAR-CONTAMINATED GROUNDWATER USING EX SITU REMEDIATION

Marschalko, M., T. Kempa, D. Popielarczyk, M. Cernik, M. Vicherkova, P. Vicherek, and D. Niemiec. I Water 14:2182(2022)

DNAPL-contaminated groundwater was remediated ex situ using excavation and thermal desorption following the closure of a coking plant in the Moravian-Silesian region of the Czech Republic. Thermal desorption (heated to a temperature >560°C) was advantageous because it allowed for absolute qualitative and quantitative control over the contaminated soil with the possibility of precise segmentation into contaminated and non-contaminated soil. All contaminated groundwater was pumped off upon the construction of sealing walls to control groundwater flow and conduct the excavation. Groundwater was treated in a train that consisted of gravitational separation, aeration, filtration, and activated carbon adsorption. The pumped and inflowing water quality before and after the remediation was compared. The locality is characteristic of a high horizontal and vertical grain-size heterogeneity of gravel-sand, which led to a varying filtration coefficient affecting the capacities of pumped groundwater quantity during the remediation. At the start of the remediation process, the contaminant levels exceeded the Czech Environmental Inspectorate limits. Post-remedial monitoring showed all the contaminant levels were below limits. The overall groundwater contamination amounted to 232.86 t of NAPL and 6,872.9 kg of dissolved contaminants. An estimated 12,200 t of contaminants were removed from the soil. https://www.mdpi.com/2073-4441/14/14/2182

Demonstrations / Feasibility Studies

ELECTROCHEMICAL DEGRADATION OF PFAS MASS IN REDUNDANT STOCKS OF AFFF CONCENTRATE AND FIRST FLUSH WASHWATER - PILOT-SCALE FIELD DEMONSTRATION

Santacroce, J., R. Casson, S. Laing, and R. Mora. I Remediation Technologies Symposium East, 1-3 June, Niagara Falls, Ontario, 29 slides, 2022

A three-month field pilot using electrochemical advanced oxidation processes (EAOP) was conducted at a facility in Australia to destroy PFAS mass contained within the solutions generated from foam transition programs. The pilot treated 13,200 L of redundant 'end-of-life' AFFF and 20,800 L of PFAS-impacted first flush wash water. The trial comprised a series of experiments under different treatment conditions and reactor configurations, including different retention times/flow rates and current supply. The experimental flow rate ranged from 200 to 1,530 L/m^2 per hour. Time-course samples were collected and analyzed for 30 PFAS compounds, total oxidizable precursor assay (TOPA)-PFAS, select anions (fluoride, sulfate, and perchlorate), total organic carbon, SVOCs, and metals. Total organic fluorine (TOF) data was collected for mass balance evaluation. After EO treatment, post-treatment first flush results indicated that PFOA concentrations were reduced from 77%-99%, and the sum of PFOS and PFHxS were reduced from 95%-100%. TOF data indicated that, under ideal operational parameters, 96% of measurable and unmeasurable PFAS mass was reduced. Following EO of post-treatment 'end- of-life' AFFF concentrate, TOF data indicated that the combined measurable and unmeasurable PFAS mass was reduced by 76%. Regulated PFAS were not detected in the AFFF as it was a C6 pure foam. On average, the EO system consumed 4.92 kWh of electricity per day, and the system can be powered by solar energy (supplemented with a battery) for future applications. A field pilot is underway at a second system constructed in the U.S. enhanced with flow-through capability and greater current density.
https://esaa.org/wp-content/uploads/2022/06/RTF22Santacroce.pdf

PRAIRIE NSZD: A COMPARISON OF NSZD RATES ACROSS NINE SITES USING NEW HIGH-DATA DENSITY TECHNOLOGY

Mamet, S., N. Higgs, and S. Siciliano I Remediation Technologies Symposium East, 1-3 June, Niagara Falls, Ontario, 36 slides, 2022

An economical and robust sensor suite ("Soil Sense") was developed to facilitate the construction of networks within and surrounding LNAPL plumes. These networks allow high-resolution spatial and temporal quantification of LNAPL plume dynamics and biological processes associated with natural attenuation (e.g., methanogenesis, methanotrophy). Natural source zone depletion (NSZD) data from nine sites across Saskatchewan and Alberta were analyzed. Gas flux (CO_2, O_2, CH_4) data, pressure, air and soil temperatures, relative humidity, and petroleum hydrocarbon vapor concentrations were collected at 30-minute intervals. NSZD rates varied as a function of site and LNAPL plume characteristics. The high-temporal resolution data generated robust estimates of areal plume extent, volume, mass, NSZD rates, and time to closure. While NSZD rates slowed during soil freeze-up, they were non-zero, which affords users a more nuanced and robust picture of natural attenuation at sites over seasons to years. https://esaa.org/wp-content/uploads/2022/06/RTF22Mamet.pdf

OZONATION FOR REMEDIATION OF PESTICIDE-CONTAMINATED SOILS AT FIELD SCALE

Martinez, C.M., I. Garrido, P. Flores, P. Hellin, F. Contreras, and J. Fenoll.
Chemical Engineering Journal 446(Part 3):137182(2022)

Pesticide-contaminated soil was remediated in a field-scale study using ozonation. Initial assays were conducted with three different soil matrices to assess the effectiveness of the methodology

under lab conditions. Field-scale experiments were carried out on greenhouse plots. To test the effect of the mode of ozone application on pesticide degradation, polluted soil was exposed to different treatments including S-polyethylene film covering, SOS-polyethylene film + surface ozone application, SOD-polyethylene film + deep application, SODS-polyethylene film + dual application, and C: no treatment. Ozonation impact was also assessed by variations of physical-chemical characteristics of the soil. Higher degradation was detected in ozonized soils, particularly in the SODS treatment, where ozone was dually applied on the surface and in deep soil. During monitoring, 15 main transformation products were found. Results suggest that ozonation should be considered a credible alternative technology to remediate pesticide-polluted soil.

MICROWAVE-INDUCED STEAM DISTILLATION (MISD) REMEDIATION IN PETROLEUM HYDROCARBON-CONTAMINATED SITES: FROM PROCESS IMPROVEMENT TO PILOT APPLICATION

Xue, Z., R. Zuo, F. Ding, Z. Wu, M. Pan, W. Cai, Y. Xu, and J. Wang.
Environmental Pollution 313:120059(2022)

A pilot remediation test was conducted, and process improvement and the decontamination mechanism of microwave-induced steam distillation (MISD) were investigated to remediate petroleum hydrocarbons (PHs). Multistage steam distillation and carbon reinforcement processes were compared to determine the best remediation process. Variations in soil moisture, temperature, and concentrations of PHs were monitored to evaluate remediation efficiency, procedures, and factors influencing the MISD treatment. The decontamination mechanisms of PHs were clarified based on kinetic analysis. Results showed that the multistage steam distillation could improve remediation efficiency by 10%-15%, and the carbon reinforcement could shorten the remediation duration of each steam distillation stage by 50%. A multistage steam distillation process was conducted through four remediation stages (initial, rapid heating-up, gentle heating-up, and quasi-equilibrium) at ≤100°C (overall temperature). The final PH removal rate was ~60%, which improved with a greater proportion of low boiling point components and stronger vapor extraction. Kinetic studies showed that PHs were removed by steam stripping and limited by intraparticle diffusion in the "steam distillation zone," while local high temperature (>100°C) greatly improved volatilization of PHs and provided activation energy for PHs desorbed and degraded in the "selective heating zone."

Research

SUCRALOSE AS AN OXIDATIVE-ATTENUATION TRACER FOR CHARACTERIZING THE APPLICATION OF IN SITU CHEMICAL OXIDATION FOR THE TREATMENT OF 1,4-DIOXANE.

Yan N., Z.L. Guo, and M.L. Brusseau. I Environmental Science: Processes & Impacts 8(2022)

A study evaluated the potential of employing sucralose as an oxidative-attenuation tracer to characterize the remediation efficiency of 1,4-dioxane using persulfate-based in situ chemical oxidation (ISCO). Batch and miscible-displacement experiments compared the degradation rate and transport behavior of sucralose with dioxane. Comparable magnitudes and degradation rates were observed for sucralose and dioxane experiments with soil and persulfate. The breakthrough curves of sucralose and dioxane transport in a soil-packed column were coincidental. The retardation factors were 1.1 for both compounds, indicating the soil's limited sorption of sucralose and dioxane. Limited degradation was observed in the miscible-displacement experiments, consistent with the short residence time compared to the half-lives of sucralose and dioxane. Persulfate transport and decomposition behavior in the soil-packed columns was similar in the presence of sucralose or dioxane. A simulated tracer test was conducted to illustrate applying sucralose as an oxidative-attenuation tracer at the pilot scale. Results demonstrate the potential of sucralose as an oxidative-attenuation tracer to support the robust design of ISCO applications for dioxane. The oxidative-attenuation tracer test method may be effective for characterizing the mass-removal behavior of other emerging contaminants with appropriate tracer selection.

CLAYS PLAY A CATALYTIC ROLE IN PYROLYTIC TREATMENT OF CRUDE-OIL CONTAMINATED SOILS THAT IS ENHANCED BY ION-EXCHANGED TRANSITION METALS.

Denison S.B., P.D. Da Silva, C.P. Koester, P.J.J. Alvarez, and K. Zygourakis.
Journal of Hazardous Materials 437:129295(2022)

Clays impregnated with non-toxic transition metals (iron or copper) were used as an amendment to decrease the required pyrolytic treatment temperature and time. Amending a weathered crude-oil contaminated soil with 10% (by weight) of bentonite, modified using ion exchange with Fe or Cu, achieved 99% residual TPH removal at a pyrolysis temperature of 370°C with 15-min contact time. Pyrolytic treatment of amended soils at 300°C resulted in 87% TPH removal efficiency with Cu-bentonite and 93% with Fe-bentonite, likely because transition metals catalyzed the pyrolysis reactions at lower onset temperatures. Thermogravimetric analysis coupled with mass spectrometry revealed the release of hydrogen, methyl, and propyl ion fragments (markers of pyrolytic degradation products of crude oil) at lower temperatures than those observed for unamended soil. The study shows proof of concept that metal-impregnated clays can enhance rapid pyro-catalytic treatment of crude-oil contaminated soils and encourages further work to understand the detailed reaction mechanisms and inform process design.

MICROBIAL DEFLUORINATION OF UNSATURATED PER- AND POLYFLUORINATED CARBOXYLIC ACIDS UNDER ANAEROBIC AND AEROBIC CONDITIONS: A STRUCTURE SPECIFICITY STUDY

Yu, Y., S. Che, C. Ren, B. Jin, Z. Tian, J. Liu, and Y. Men.
Environmental Science & Technology 56)8):4894-4904 (2022).

A study examined the structure-biodegradability relationships of 13 fluorinated carboxylic acids (FCAs) (nine commercially available unsaturated and four structurally similar saturated) in an anaerobic defluorinating enrichment and an activated sludge community. Anaerobic and aerobic transformation/defluorination pathways were elucidated. Under anaerobic conditions, α,β-unsaturation was crucial for FCA biotransformation via reductive defluorination and/or hydrogenation pathways. The reductive defluorination became less favorable than hydrogenation when C-H bonds substituted for sp^2 C-F bonds. The study also showed enhanced degradability and defluorination capability of specific unsaturated FCA structures with trifluoromethyl (-CF_3) branches at the α/ β-carbon. Such FCA structures can undergo anaerobic abiotic defluorination in the presence of reducing agents and significant aerobic microbial defluorination.

GRAVITY-DRIVEN ELECTROSPUN MEMBRANES FOR EFFECTIVE REMOVAL OF PERFLUORO-ORGANICS FROM SYNTHETIC GROUNDWATER.

Wan, H.Y., R. Mills, Y.X. Wang, K.Y. Wang, S.J. Xu, D. Bhattacharyya, and Z. Xu
Journal of Membrane Science 644:120180(2022)

Open structure electrospun membranes were hypothesized to treat PFAS in a gravity-driven mode with ultralow pressure needs. The fibers (67 ± 27 nm) were prepared with poly-vinylidene fluoride (PVDF) backbones and grafted quaternary ammonium moieties (QA; PVDF-g-QA membranes) to provide both hydrophobicity and anion-exchange ability. High affinity towards PFOA/PFOS molecules (denoted as PFOX collectively) was observed; >95% PFOX was removed from synthetic groundwater with a flux of 32.3 L/m ^{2}/h at ΔP_0 = 313 Pa. With a higher octanol/water partitioning coefficient (Log K_{OW} = 6.3) and close dispersion interaction parameter to the membrane backbones (16.6% difference in δ_d), effective PFOS removal remained under alkaline and high conductivity conditions due to the intensive hydrophobic interaction compared to that of PFOA. Long-term studies exhibited >90% PFOX removal in an 8-h test with a capacity of 258 L/m ^{2}. Under mild regeneration conditions, PFOA and PFOS were concentrated 35-fold and 39-fold, respectively. Gravity-driven electrospun PVDF-g-QA membranes, with adsorptive effectiveness and ease of regeneration, showed great potential in PFAS remediation.

RAPID REMOVAL OF PFOA AND PFOS VIA MODIFIED INDUSTRIAL SOLID WASTE: MECHANISMS AND INFLUENCES OF WATER MATRICES.

Wan, H.Y., R.C. Mills, K. Qu, J. Hower, M.A. Mottaleb, D. Bhattacharyya, and Z. Xu.
Chemical Engineering Journal 433(Part 2):133271(2022)

Coal combustion residuals-fly ash was modified (FA-SCA) to overcome the universal trade-off between high adsorption capacity and fast kinetics to treat PFAS-contaminated water. FA-SCA presented rapid adsorption (t_{eq} = 2 min) of PFOX (PFOA and PFOS, collectively). The dynamic adsorption capacity ($q_{dyn} = q_m/t_{eq}$) was 2-3 orders higher than benchmark activated carbons and anion-exchange resins. The fast kinetics and superior q_{dyn} were attributed to elevated external diffusion driven by the submicron particle size, enhanced intraparticle diffusion caused by the developed mesoporous structure (V_{meso}/V_{micro} = 8.1), numerous quaternary ammonium anion-exchange sites (840 μmol/g), and appropriate adsorption affinity (0.031 L/μmol for PFOS, and 0.023 L/μmol for PFOA). Since the adsorption was a synergistic process of electrostatic and hydrophobic interactions, effective adsorption ($[PFOX]_{ni}$ = 1.21 μM) was obtained at conventional natural water chemistries. High selectivity (>85.4% removal) was also achieved with organic/inorganic competitors, especially compounds with similar molecular structures to PFOX. In addition, >90% PFOX was removed consistently during five cycles in mild regeneration conditions (pH 12 and 50°C). Overall, FA-SCA showed no leaching of toxic metals and exhibited potential in both single-adsorption processes and treatment train systems.

DUAL-FUNCTIONAL NANOFILTRATION AND ADSORPTIVE MEMBRANES FOR PFAS AND ORGANICS SEPARATION FROM WATER

Leniz-Pizarro, F., R.J. Vogler, P. Sandman, N. Harris, L.E. Ormsbee, C. Liu, and D. Bhattacharyya. I ACS ES&T Water 2(5):863-872(2022)

Solute rejections by nanofiltration (NF) at pH values near the membrane isoelectric point were compared to the size- and mass-transfer-dependent modeled rejection rates in an ionized state. The low pK_a value of PFOA relates to enhanced solute exclusions by minimizing the presence and partitioning of the protonated organic compound into the membrane domain. The effects of Donnan exclusion were moderate, and co-ion transport also contributed to PFAS rejection rates. An additional support barrier with thermo-responsive (quantified by water permeance variation) adsorption/desorption properties enhanced separations of PFAS by successfully synthesizing an NF layer on top of a poly-N-isopropylacrylamide (PNIPAm) pore-functionalized microfiltration support structure. The support layer adsorbs organics (178 mg PFOA adsorbed/m^2 membrane at an equilibrium concentration of 70 mg/L), and the simultaneous exclusion from the NF layer allowed separations of PFOA and the smaller-sized heptafluorobutyric acid from solutions containing 70 μg/L of these compounds at a high water flux of 100 L/m^2-h at 7 bar.

General News

A NEW METHOD FOR THE ANALYSIS OF PFAS IN NON-POTABLE WATER

Zintek, L., W. Lipps, L. Zintek, and D. Kleinmaier.
Environmental Measurement Symposium: Hitting Reset, 2-5 August, Bellevue, WA, 25 slides, 2021

This presentation covers ASTM Committee D19's progress to date in developing and drafting a new method to replace or supplement ASTM Method D7979 to analyze PFAS in non-potable water samples. The method will extract samples in the same manner as D7979, but more compounds are being added along with additional calibration schemes, including isotope dilution. Once developed and optimized, the method will undergo an inter-lab study. The presentation includes chromatography and single laboratory validation and interference studies.
https://apps.nelac-institute.org/nemc/2021/docs/presentations/pdf/8-2-21-Polyfluoroalkyl%20Substances%20(PFAS)%20in%20the%20Environment-5.02-Lipps.pdf

COMPARISON OF RADIOCARBON- AND BACKGROUND LOCATION-CORRECTIONS ON SOIL-GAS CO_2 FLUX-BASED NSZD RATE MEASUREMENTS AT PETROLEUM IMPACTED SITES

Zimbron, J.A. I Groundwater Monitoring & Remediation 42(3):116-122(2022)

This article evaluates two correction methods to distinguish the nature of the measured CO_2 flux produced by natural source zone depletion (NSZD) processes: (1) The background location correction subtracts a measurement from an unimpacted location from measurements collected at impacted locations, and (2) a location-specific radiocarbon (^{14}C) analysis that differentiates the modern and old carbon fractions of each total CO_2 measurement. Both correction approaches were evaluated using 36 measurements at impacted locations from five sites. The ^{14}C-corrected data shows that the magnitude and variability of the modern carbon-related fraction (noise) and the NSZD-related fossil fuel signal are similar, suggesting a location-specific correction is more valid. Only one sparsely vegetated arid site showed close agreement between both corrections (^{14}C- and background location). These results highlight the strong effect of the correction method used on NSZD rate measurements and the importance of considering data quality in the subsequent data management process.
https://ngwa.onlinelibrary.wiley.com/doi/epdf/10.1111/gwmr.12538

GRAPHICAL SHADING LOGS: AN IMPROVED APPROACH FOR COLLECTING HIGH RESOLUTION SEDIMENTOLOGICAL DATA AT CONTAMINATED SITES

Meyer, J., J. Munn, E. Arnaud, J. Kennel, and B. Parker.
Groundwater Monitoring & Remediation 42(3):59-74(2022)

This article describes a graphical approach to core logging, the graphical shading log that facilitates rapid, accurate capture of sedimentological data, and a complementary database to store the raw data and interpretations. The visual format of the graphical shading log provides a roadmap of the parameters to log and their possible values, to help ensure accurate and consistent

data collection by loggers. Examples from sites with contaminated groundwater in glaciogenic sediments and siliciclastic and carbonate bedrock show how data from the graphical shading logs can improve geological interpretations, support the design of high-resolution multilevel systems needed to collect minimally blended hydrogeologic data, and help to more accurately delineate hydrogeologic units. The format of the graphical shading log and complementary database is designed to be customizable and transferable between hydrogeologic settings, providing a new tool to advance geological data collection and management. Improved sedimentological data and insight are critical inputs for process-based conceptual site models to effectively manage subsurface contaminant plumes.
https://ngwa.onlinelibrary.wiley.com/doi/epdf/10.1111/gwmr.12521?utm_source=google&utm_medium=paidsearch&utm_campaign=R3MR425&utm_content=EarthSpaceEnvirSci

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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