Technology Innovation News Survey

Entries for October 16-31, 2023

Market/Commercialization Information

F -- R7 CANEY SUPERFUND SITE OUT REMEDIAL ACTION (SOL) U.S. Environmental Protection Agency, Region 7. Leneva VS Contract Operativities

Environmental Protection Agency, Region 7, Lenexa, K htract Opportunities on SAM.gov 68HE0724R0002, 2023

B - B502--VPIH FOR ENVIRONMENTAL SAMPLING REQUIREMENTS CONTRACT (SOL) U.S. Department of Veterans Affairs, 250-Network Contract Office 10, Dayton, OH Contract Opportunities on SAM, gov 36C52024Q0075, 2023

This is a service-disabled veteran-owned small business set-aside under NAICS code 541620. The U.S. Department of Veterans Affairs requires a contractor to perform environmental sampling services at the Richard L. Roudebush VA Medical Center in Indianapolis, Indiana. The environmental sampling services include asbestos abatement and other services as needed and require a VA Professional Industrial Hygienist. Asbestos testing must be done by an Asbestos Hazard Emergency Response Act (AHERA) trained and certified technicians licensed in the State of Indiana. The contract varval will be an Indenitive Delivery Requirements (ID/R) type of contract. The contractor will be required to begin performance within 24 hours of award. Offers are due by 10:00 AM EST on December 20, 2023. <u>https://sam.gov/opp/fb4c4d9ct2344de3arf742b7ee116429/view</u>.

- JOINT BASE CAPE COD (JBCC) OPTIMIZED REMEDIATION CONTRACT (ORC) (SRCSGT) 5. Army Corps of Engineers, Baltimore District, Baltimore, MD tract Opportunities on SAM-gov W912DE24780018, 2023

This is a sources sought notice for marketing research purposes only under NAICS code 562910. The U.S. Army Corps of Engineers seeks qualified contractors interested in providing environmental services to support the Air Force at Joint Base Lape Cod in Massachusetts as part of its efforts in executing its Environmental Restoration Program via a performance-based Optimized Remediation Contract (ORC). The project consists of performing environmental remediation activities, progress to Site Closeout at 16 Installation Restoration Program sites and one Millitary Munitotions Response Program site. The period of performance for this contract (WBC). The project consists of performing environmental remediation activities, subject consolid at 16 Installation Restoration Program sites and one Millitary Munitotions Response Program site. The period of performance for this contract (WI be ten years. Large businesses (SBN), Section 8(a), Historically Underutilized Business (SDB), Neteran-Owned Small Business (WOSB), Service-Disabled Veteran-Owned Small Business (WOSB), Service-Disabled Veteran-Owned Small Business (WOSB), Service-Disabled Veteran-Owned Small Business (WOSB), activity encouraged to participate. Capability Statements are due by 12:00 PM EST on December 15, 2023. <u>https://sam.own/and/is/site/sce/sh0778/ald40138/dfit86/dfit/Aiem</u>

SLDA REMEDIATION SERVICES (SRCSGT) U.S. Army Corps of Engineers, Buffalo District, Buffalo, NY Contract Opportunities on SAM.gov W912P424S0001, 2023

This is a sources sought notice for marketing research purposes only. The U.S. Army Corps of Engineers, Buffelo District, seeks sualified contractors who are interested in providing follow-on remediation services at the 44-arce Shallwall and Dissoal Area (SLDA) in Vandingth, Pennsynkins and en NALS code 55210. The SLDA is part of the Formerly Ulited State Rendeall Action Program (FUSRAR), which directs USACE to clean up states with contraintation reservices at the 44-arce Shallwall for m the Nation's early atomic energy program. The contractor will provide personnel, equipment, tools, materials, supervision, other items, and non-personnel services necessary to perform remediation services. These services are required to be consistent with those supporting the FUSRAR program (SLBARK) in Value 234, uranium-234, uranium-234, uranium-234, uranium-234, uranium-234, uranium-238, and uranium-238. Results of sampling completed at SLDA indicate that uranium-contaminated materials placed in the trenches are present in a wide range of enrichments, from less than 0.2 percent. The weight analysis directed present of a weight and on the SLO project site anticipated vialue of the follow-on contract action is \$250 - \$500 million. Capability statements are due by 3:00 PH SLO materials 12, 222.

Cleanup News

REGENERABLE IX RESIN FOR PFAS TREATMENT – 6 YEARS LATER... WHAT WE'VE LEARNED... Newman, P. and D. Kempisty. I RemTech 2023; Remediation Technologies Symposium 2023, 11-13 October, Banff, Alberta, Canada, 23 slides, 2023

This presentation provides an update on regeneration use to remediate and contain PFAS based on continuous operation of full-scale systems at Defense sites servicing the Northern Territory of Australia. Since 2018, over 20 regeneration cycles have been performed without residual PFAS buildup on the resin. Additionally, no physical headshown of the resent and the resent of the resent and the cost per kilogram of hmS removed. An ISO-cost segment of the resent expression between the environmental burden associated with granular activated cannon, physical expressions and the cost per kilogram of hmS removed. An ISO-cost segment and the cost per kilogram of hmS removed. An ISO-cost segment and the cost per kilogram of hmS removed and the cost per kilogram of hmS removed. An ISO-cost segment and the cost per kilogram of hmS removed. An ISO-cost segment and the cost per kilogram of hmS removed. An ISO-cost segment and the cost per kilogram of hmS removed. An ISO-cost segment and the cost per kilogram of hmS removed. An ISO-cost segment and the cost per kilogram of hmS removed. An ISO-cost segment and the respective and the respective and burden associated with granular activated canton, physical expressions and results of the environmental burden associated with granular activated canton, physical expressions and results of the environmental burden. Sampling results collected pre- and post-ion exchange resin vessels and analyzed for microplastic concentration, plastic type, states performant net cost per kilogram of hmS removed and head results of the environmental burden. Sampling results collected pre- and post-ion exchange resin vessels and analyzed for microplastic concentration, plastic type, states provide as anyther and thread significant and results activated as and physica segment humbade significant and results and head the environment. **Sides physica and your content humbade significant and results and the respective states and results and the respective states and results analyzed for microplastic concentr** morphology, and size a Slides:https://esaa / onger Abstract:h

IN-SITU PFAS IMMOBILIZATION AND BEYOND: LEVERAGING BIOCHAR AND PHYTOREMEDIATION FOR SUCCESSFUL SITE MANAGEMENT Mankowski. L. and B. Reiter. I RemTech 2023: Remediation Technologies Symposium 2023, 11-13 October, Banff, Alberta, Canada, 31 sildes, 2023

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TECHNICAL SUPPORT FOR MONITORED NATURAL ATTENUATION OF A URANIUM, THORIUM, AND MERCURY CONTAMINATED WETLAND ALONG THE SAVANNAH RIVER, USA Kasian, D.I.TM Remplex Virulai (Bosha Summi, 1416) Reverber, 11 siles, 2023

The TNX Area (at T-Area) at the Savannah River site is a former piol-scale nuclear facility that released processed waste, including uranium (U), thorium (Th), and mercury (Hg), into a seepage basin adjacent to a wetland between 1958 and 1980. A sequential extraction protocol was used to determine description K_dvalues, ranging from 115 to 2,255 mL/g for Th, 170 to 5,485 mL/g for Hg. Compared to (adjscription K_dvalues, ranging from 115 to 2,255 mL/g for Th, 170 to 5,485 mL/g for Hg. Compared to (adjscription K_dvalues, ranging from 115 to 2,255 mL/g for Th, 170 to 5,485 mL/g for Hg. Compared to (adjscription K_dvalues, ranging from 115 to 2,255 mL/g for Th, 170 to 5,485 mL/g for Hg. Compared to (adjscription K_dvalues, ranging from 115 to 2,255 mL/g for Th, 170 to 5,485 mL/g for Hg. Compared to (adjscription K_dvalues, ranging from 115 to 2,255 mL/g for Th, 170 to 5,485 mL/g for Hg. Compared to (adjscription K_dvalues, ranging from 115 to 2,255 mL/g for Th, 170 to 5,485 mL/g for Hg. Compared to (adjscription K_dvalues, ranging from 115 to 2,255 mL/g for Th, 170 to 5,485 mL/g for Hg. Compared to (adjscription K_dvalues, ranging from 115 to 2,255 mL/g for Th, 170 to 5,485 mL/g for Hg. Compared to (adjscription K_dvalues, ranging from 115 to 2,255 mL/g for Th, 170 to 5,485 mL/g for Hg. Compared to (adjscription K_dvalues, ranging from 115 to 2,255 mL/g for Th, 170 to 5,485 mL/g for Hg. Compared to (adjscription K_dvalues, ranging from 115 to 2,255 mL/g for Th, 170 to 5,485 mL/g for Hg. Compared to (adjscription K_dvalues, ranging from 115 to 2,255 mL/g for Th, 170 to 5,485 mL/g for Hg. Compared to Hg. Hg. Compared t

Demonstrations / Feasibility Studies

SUBSURFACE PER- AND POLYFLUOROALKYL SUBSTANCES (PFAS) DISTRIBUTION AT TWO CONTAMINATED SITES Schumacher, B., J. Zimmerman, K. Bronstein, R. Warrier, C. Lutes, E. Escobar, and A. Williams. U.S. Environmental Protection Agency, EPA/600/R-23/294, 165 pp, 2023

This investigation represents EPA's initial research into whether the VI exposure pathway is pertinent to PFAS chemicals, focusing on fluorotelomer alcohols. The investigation was designed to determine whether there is sufficient attenuation (e.g., due to biodegradation) of PFAS vapor concentrations in the vadose zone overlying PFAS-contaminated groundwater or soil to limit or prevent PFAS VI. The study focused on two sites, a PFAS manufacturing plant in New Jersey and a closed, unlined MSW landfill in Georgia, where volatile PFAS were likely present in the soil or uppermost groundwater-bearing zone. The study fulliform regulators to help them decide whether VI should be evaluated at the hundreds of sites where PFAS are reasonably expected to have been released to the subsurface and determine what additional research is necessary to evaluate the threat before making policy decisions.

USING GEOSPATIAL ANALYSES TO IDENTIFY CONTAMINANT SOURCE AREA AND TRANSPORT OF A PFAS PLUME Small, E. I 2023 Emerging Contaminants in The Environment Conference, 18-19 April, Champaign, IL, 17 minutes, 2023

A case study examined novel geospatial approaches to identify PFAS source areas and characterize PFAS plumes at data- and resource-limited sites. The methods were developed and validated using 22 groundwater samples analyzed for PFOA, PFOS, and PFHxS between March 2021 and May 2022 at the Sandy Hollow groundwater contamination Superfund site in Rockford, Illinois. The 9 sq mi site comprises -300 private wells and two impacted community water supplies. Initial results successfully integrated site history, LIDAR data, and geospatial methods using a groundwater south transport. Findel between and transport. Findelings will serve areas. Ongoing work aims to validate the geospatial methods using a groundwater south transport. Their final methods using a groundwater south transport method is and transport. Final methods to south the south transport method is and transport. Final methods using a groundwater south transport method is and transport. Final methods using a groundwater south transport method is and transport. Final methods using a groundwater south transport method is and transport. Final methods using a groundwater south transport method is and transport. Final methods using a groundwater south transport method is and transport. Final methods using a groundwater south transport method is and transport. Final methods using a groundwater south transport method is and transport. Final methods using a groundwater south transport method is and transport. Final methods using a groundwater south transport method is and transport. Final methods using a groundwater south transport method is and transport method is an

EVALUATING AND APPLYING SITE-SPECIFIC NAPL DISSOLUTION RATES DURING REMEDIATION Stewart, L., M. Widdowson, J. Chambon, R. Deeb, M. Kavanaugh, and J. Nyman. ESTCP Project ER19-5223, 251 pp, 2023

Stevart, L, M. Widdowson, J. Chambon, R. Deep, M. Kavanaugn, and J. Nymen. EDI // Project. ENT-2023, 201 Pp. 2023 The objective drifts project was to establish a practical and ocd-strepticive method to assess source control at NAPL sites using site- and technology-specific NAPL dissolution rates in a volume-averaged source zone. The project implemented a volume-averaged source zone model based on upscaling complex IAPL dissolution processes to characteristic dimensions of multiple NAPL accumulations. Mathematical description of complex processes was combined into a system of oncyled, nonlinear, first-order differential equations through numer-averaging. The outputs is an order of-manitude estimate for source cone discharge come and discharge come dis and discharge come discharge come dis and discharge com Ba6UskIH7RPDMs36Sha9VYzSeO

Executive Summary: http: User's Guide: https://serd

FIELD DEMONSTRATION OF IN-SITU MICROEMULSION FLUSHING FOR ENHANCED REMEDIATION OF MULTIPLE CHLORINATED SOLVENTS CONTAMINATED AQUIFER Mo. Y., J. Dong, and H. Zhao. I. Journal of Hazardous Materials 463:132772(2023)

Work was conducted to evaluate the remediation effectiveness at a chiorinated solvent-contaminated site and monitor groundwater disturbance during an in situ microemusion flushing process. Groundwater was contaminated with chioroberzene (MCB), chioroaniline and nitrochioroberzene. The medium layer was mainly composed of fine and silly sand, with an average hydraulic conductivity of 4.97 m/d. Results of the field-scale test indicated in situ microemusion flushing successfully enhanced the apparent solubility of various chiornated solvents. The post-flushing concentration of chiornated solvents was a "1.37-16-fold the concentration of per-flushing values at 10 sampling locations. The area was flushed with a 1.68 m/ circoemulation, removing – 124 kg of chiornated solvents. Are the desception or of various chiornated solvents was observed. The least hydrophobic pollulant was flushed first, followed by contaminants of increasing hydrophobicity. During remediation, the indexes of groundwater fluctuated insignificantly, indicating minimal disturbance to the aquifer by the reagent. The work demonstrated the flessibility of in situ microemulation values area grapherent solubility of multiple chiornated solvents.

Research

RESEARCH BRIEF 347: HIGH-TEMPERATURE BIOCHAR FOR ARSENIC REMEDIATION National Institute of Environmental Health Sciences, Superfund Research Program, November 2023

Adding biocharge in instance of curvo inferior early being in research roughant, november 2023 Adding biocharge produced at a bigh temperature may be an effective way to immobilize arsenic in sediment, according to NIEHS-funded research. Researchers hypothesized that heating the biochar to different temperatures would affect the chemical composition of the material. According to the team, changing the composition of biochar may affect how much organic carbon is released and impact the biochar's ability to remediate arsenic. To test their hypothesis, biochar was produced by heating sugarcanes straw at 350°C, 550°C, and 50°C. The biochars were mixed with soil contaminated with arsenic and allowed to age for 30 days. Each biochar and soil mixture, along with a control of only soil, went through two cycles of flooding with water for 30 days before draining for 10 days. Finally, the researchers collected water and soil astures and along to an alyze for arsenic and organic carbon content. Results showed that heating big higher temperatures made the material less likely to release organic carbon. The lack of organic carbon means less arsenic will be converted in to its mobile form. Higher temperatures used the material less likely to release organic carbon. The lack of organic carbon means less arsenic will be converted in to its mobile form eater and estimation and the attration because the subscher effects biochar efficacy and the environmental conditions necessary for electron movement, such as the presence of water or pl of the soil. <u>History/most highs negative</u> for allowed to the subscher and billis the industry states and the environmental conditions necessary for electron movement, such as the presence of water or pl of the soil.

GENOME-RESOLVED METAGENOMICS AND METATRANSCRIPTOMICS REVEAL INSIGHTS INTO THE ECOLOGY AND METABOLISM OF ANAEROBIC MICROBIAL COMMUNITIES IN PCB-CONTAMINATED SEDIMENTS Dang, H., JM. Ewald, and T.E. Mattes. I Environmental Science & Technology 57(43):16386-16398(2023)

Metagenomic and metatranscriptomic sequencing was conducted on DNA and RNA extracted from sediment microcosms to evaluate naturally occurring interactions between Dehalococcoides and key supporting microorganisms (e.g., production of H₂, acetate, and corrinolds) in PCB-contaminated sediments, showing evidence of both Dehalococcoides growth and PCB dechloringting a genome-resolved approach, 160 metagenome-assembled genomes (MAGs), including three Dehalococcoides WAGs, were recovered. A novel produces, etc.). A new of coorgenession analysis of all 160 MAGs revealed correlations between 39 MAGs. In network coorgenession analysis of all 160 MAGs revealed correlations between 39 MAGs. The methows nanizes also showed that MAGs and the Dehalococcoides MAGs. The network analysis also showed that MAGs and the Dehalococcoides MAGs. The network analysis also showed that MAGs and the Dehalococcoides MAGs. The network analysis also showed that MAGs and the Dehalococcoides MAGs. The work demonstrates the power of genome-resolved metagenomic and metatranscriptomic analyses, which unity taxonomy and function, in investigating the ecology of dehalogenating microbial communities.

USING 19F MMR TO INVESTIGATE CATIONIC CARBON DOT ASSOCIATION WITH PER- AND POLYFLUOROALKYL SUBSTANCES (PFAS)

Lewis, R.E., C.H. Huang, J.C. White, and C.L. Hay ACS Nanoscience Au 3(5):408-417(2023)

This study focused on determining if nanoscale polymeric carbon dots are a viable sorbent material for PFAS and developing fluorine nuclear magnetic resonance spectroscopy (F-19 NMR) methods to probe interactions between carbon dots and PFAS at the modelcular scale. Positively charged carbon dots (PEI-CDs) were synthesized using branched polyethylenemine to target anionic PFAS by promoting electrostatic interactions. PEI-CDs were exposed to PFA to assess their potential as a PFAS sorbent material. The average size of the PEI-CDs increased (1-56 + 0.5 km) and the surface charge decreased (+36 + 1-1 to +5.6 + 1-6 km) after PFOA exposes their potential as a PFAS sorbent material. The average size of the PEI-CDs increased (1-56 + 1-1 to +5.6 + 1-1 to +5.6 + 1-6 km) after PFOA exposes their potential as a PFAS sorbent material. The average size of the PEI-CDs increased (1-56 + 1-1 to +5.6 + 1-1 to +5.6 + 1-6 km) after PFOA exposes their potential exchange trademine the telecond material increased (1-56 + 1-1 to +5.6 + 1-1 to +5.6 + 1-6 km) after PFOA exposes (1-56 + 1-6 km) after PFOA expose (1-56 + 1-6 km) after PFOA exposes (1-56 + 1-6 km) after PFOA expose (1-56 + 1-6 nt with

TREATMENT OF THE INSENSITIVE MUNITIONS COMPOUND, 3-NITRO-1,2,4-TRIAZOL-5-ONE (NTO), IN FLOW-THROUGH COLUMNS PACKED WITH ZERO-VALENT IRON Yu, Y., R.A. Root, R. Sierra-Alvarez, J. Chorover and J.A. Field. Environmental Science and Pollution Research 30: 64606-64615(2023)

A study investigated the feasibility of applying zero-valent iron (ZVI) in a continuous-flow packed bed reactor as an effective nitro-1,2,4-triazol-5-one (NTO) remediation technology. The ZVI-packed columns treated an acidic influent (pH 3.0) or a circumneutral influent (pH 6.0) for 6 months (ca. 11,000 pore volumnes). Both columns effectively reduced NTO to the amine product, 3-amino-1,2,4-triazol-5-one (NTO). The column treating the pH-3.0 influent between the column treating the pH-3.0 influent experiment, pH 6.0 influent to the amine product, 3-amino-1,2,4-triazol-5-one (NTO). The exhausted columns (1% of NTO removed) regained the NTO-reducing and the breakthrough point (when 85% of NTO was removed). The exhausted columns (1% of NTO removed) regained the NTO-reducing and the NTO-reducing 11 of Hold more PVs than the experiment, solid-phase analysis of the packed-bed material showed that ZVI was colidized to iron (oxyhydr) oxide minerals such as magnetite, lepidocrocite, and goethite during NTO.

SYNTROPHIC INTERACTIONS AMELIORATE ARSENIC INHIBITION OF SOLVENT-DECHLORINATING DEHALOCOCCOIDES MCCARTYI.

Gushgari-Doyle, S., C.I. Olivares, M.H. Sun and L. Alvarez-Cohen. Environmental Science & Technology 57(38):14237-14247(2023)

A study assessed the effects of a toxic stress event, the addition of arsenite (As(IIII)), on a syntrophic co-culture containing lactate-fermenting Desulfovibrio vulgaris Hildenborough and solvent-dechlorinating Dehalococcoides mccarty/ strain 195. The presence of bioavailable advances in a syntrophic co-culture containing lactate-fermenting Desulfovibrio vulgaris Hildenborough and solvent-dechlorinating Dehalococcoides mccarty/ strain 195. The presence of bioavailable advances in a syntrophic co-culture containing lactate-fermenting Desulfovibrio vulgaris Hildenborough and solvent-dechlorination presence of bioavailable advances in a syntrophic to culture containing lactate-fermenting Desulfovibrio vulgaris Hildenborough and solvent-dechlorination presence of Desultate advances in a syntrophic to culture in a main melliorated argenesis trass on Democratic syntrophic co-culture lunder arsenic stress on Democratic stress on Democrations of transporters and increased extracellular nutrients like sarcosine and ornithine. Results broaden knowledge of microbial community interactions and support further development and implementation of robust bioremediation argenesis and unplementation of robust bioremediation argenesis and unplementation of robust bioremediation argenesis and support further development and implementation of robust bioremediation and support further development stress on Development stress on

TRANSPORT AND NATURAL ATTENUATION OF BENZENE VAPOR FROM A POINT SOURCE IN THE VADOSE ZONE Sun Y. G. Yue, and J. Ma. J. Chemosphere 323:138222(2023)

A column accomment combined with a model study was conducted to investigate the influence of soil type, values zone thickness, and soil moieture content on barrane vapor transport and natural attenuation in the values zone. Data showed that biodegradation in black soil is the main natural attenuation mechanism (32 %). Volatilization is the main natural attenuation mechanism (32 %). Volatilization is the main natural attenuation mechanism (32 %). Volatilization is the main natural attenuation mechanism (32 %). Volatilization soil type, water close with four soil optimicantly endued to a sole optimicant or the value of the

General News

REMOTE SENSING TOOLS FOR ENVIRONMENTAL MONITORING AND CERTIFICATION OF WELL SITES Mackenzie, D. and E. Loos. I RemTech 2023: Remediation Technologies Symposium 2023, 11-13 October, Banff, Alberta, Canada, 30 slides, 2023

machenize, D. and E. Doss, Tremmedir 2023, Reminutation 1 reclamostation structs, 11:13 October, Baim, Addated, and developed using Earth Observation (ED) image data and cutting-edge machine learning (ML) and artificial intelligence (A) technologies to process large volumes of remotely-sensed imagery quicky and efficiently. This will load and proving technologies to process large volumes of remotely-sensed imagery quicky and efficiently. This will approach the very equation because of no direct cortact with the surface and can also reduce the spread of diseases, EDB and the characterizing well sets in the vertain and vertain estimated by oil and gas operations. Remote sensing tools were developed using Earth Observation (ED) image data and cutting-edge machine learning (ML) and artificial intelligence (A) technologies to process large volumes of remotely-sensed imagery quicky and efficiently. This will load prove environmental monitoring is conducted through improvements provided by using and analyzing ED imagery and related spalial data. In contrast to conventional field-based monitoring carangians, remote sensing achinques to address environmental monitoring of reclamation efforts by locating abandoned or suspended padded well sites and non-padded well sites in the wetland areas of the Green Zone. Additionally, remote set tools will help determine the sustainality of forests. The advantage of these methods relies on incorporating the latest ML and AI technologies to process and analyze large-area coverage EO data to help reduce well site liabilities and the process and analyze large-area coverage EO data to help reduce well site liabilities and the process and analyze large-area coverage EO data to help reduce well site liabilities and the set the set of the se

DEVELOPMENT OF SCALABLE REACTIVE TRANSPORT FRAMEWORK FOR PFAS. Johnson, C.D., C.E Bagwell, and R.L. Bence. Pacific Northwest National Laboratory Report PNNL-35136, 46, 2023.

This work provides kinetic reaction modules that represent an initial offering at functionality representing PFAS migration and reaction in groundwater aquifer flow and transport models. One reaction kinetics module provides a method to model kinetically limited adsorption using a mass transfer model. The second module represents biological transformation of 8:2 FTOH and daughter species, illustrating how a complex reaction pathway network can be represented. The represented as provides a method to the reaction modules allow spatially variable parameter values to simulate various remediation approaches (e.g., a permeable reactive barrier, volumetric treatment, or variations in geochemical conditions). The PFAS reaction use there determine whether these reaction modules are intended to provide tools for practitioners to add in selecting, designing, and assessing potential in situ PFAS remediation strategies. Application of these modules will require that practitioners determine whether these reaction modules are releaded to be refined or replaced to be refined or replaced to match models and release an anticipated to be refined or replaced to match models and release an anticipated to be refined or replaced to match models and release and individe to be refined or replaced to match models and release and individe to be refined or replaced to match and the second model and release and individed to be refined or replaced to match and the second as an anticipated to be refined or replaced to match and the second and anticipated as an anticipated to be refined or replaced to match and the second as an anticipated to be refined or replaced to match and the second and and the se

REVIEWING THE BIOREMEDIATION OF CONTAMINANTS IN GROUNDWATER: INVESTIGATIONS OVER 40 YEARS PROVIDE INSIGHTS INTO WHAT'S ACHIEVABLE Davis. G.B. I Frontiers in Bioscience (Eilte ed) 15(3):16(2023)

INTEGRATING DENSITY FUNCTIONAL THEORY INTO REDUCTIVE DECHLORINATION RESEARCH Schober, J.D., S. Kurwadkar, and W.F. Harper Jr. I Remediation 33(4):389-393(2023)

Reductive dechlorination (RD) research is reviewed in this article due to the growing incorporation of density functional theory (DFT) as a research tool. DFT has uncovered various reaction properties for relevant groundwater pollutants, including 1.2.3-trichloropropane, hexachirorbenzene, and various dioxins. DFT models have revealed the role of surface interactions in driving the kinetics of catalytically driven RD. Mechanisms involved with biologically mediated RD are also elucidated with insights gleaned from DFT. Issues and challenges for future research are also discussed.

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@lepa.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.