Technology Innovation News Survey

Entries for October 1-15, 2019

Market/Commercialization Information

FT VANCOUVER DU-NE-1 SOIL REMEDIATION Department of the Interior, National Park Service, Port Angeles, WA. Contract Opportunities from Beta.Sam.gov, Solicitation 140P8319R0013, 2019

This requirement is a total small business set-aside under NAICS code 562910, size standard 750 employees. The National Park Service requires targeted soil removal at the Decision Unit-Northeast-1 (DU-NE-1) site at the Ft. Vancouver National Historic Site, in Vancouver, Washington, to restore the site soil to safe levels for visitors and employees. In addition, the contractor will dispose of steel drums (55-gailon type) previously stockpiled with potentially lead-contaminated soil. Additional details are provided in the Statement of Work, Attachment 1 at <u>https://www.fdcannet.aet/Facd/TangeTate/Tang</u>

DETECTION AND/OR IDENTIFICATIONOF CHEMICALS, EXPLOSIVES AND/OR FUNCTIONAL GROUPS ASSOCIATED WITH EXPLOSIVES Army Contracting Command, ACC (W911SR), Aberdeen Proving Ground, Edgewood, MD. Contract Opportunities from Beta-Sam.gov, Solicitation W911SR-20-R-EXPL, 2019

The purpose of this announcement is to gather information on state-of-the-art technologies to detect or identify potential chemicals and functional groups associated with explosives. These technologies can take the form of handheld, benchtog or standoff detection constructs and might include but are not limited to X-ray diffraction, X-ray fluorescence, nuclear magnetic resonance, ion mobility spectroscopy, or FTIR spectroscopy. Specifically, the Government is attempting to identify systems that will work within operationally relevant environments and have the ability to detect or identify transoc sompounds and explosives. The applicable NAICS codes for this RFI are 334516 and 541715. Submit relevant test reports and other applicable documents with the response by 11:59 PM ET on December 2, 2019. <u>https://document.org/line.code/line.co</u>

SOURCES SOUGHT SYNOPSIS FOR NAVY CLEAN REQUIREMENT Naval Facilities Engineering Command Pacific, Pearl Harbor, Hawaii. Contract Opportunities from Beta.Sam.gov, Solicitation N6274220CLEAN, 2019

A-E SERVICES FOR RANGE SUSTAINABILITY SERVICES FOR MILITARY TRAINING AND TESTING RANGE COMPLEXES AND ASSETS AT LOCATIONS WORLDWIDE NAVFAC Southwest, Environmental Contracts, BRAC, San Diego, CA. Contract Opportunities from Beta Sama, ov, Solicitation N6247320R0024, 2019

This procurement is unrestricted under NAICS code 541330, small business size standard \$16.5M. A-E firms desiring to be considered must submit a completed SF-330 package for a contract to provide range sustainability services for milit training/testing range complexes and assets at various locations worldwide. Contract services also include environmental planning associated with NEPA and Executive Order 12114 (Environmental Effects Abroad of Abroad of Store Governed) and the services for milit support of the Tactical Training Theater Assessment and Planning Program. The IDIQ contract will have a base period of 24 months and one S-year option period for a total contract amount not to exceed \$100. Most of the work awarded under the contract will involve Navy training range complexes within the Pacific Fleet area of operations. SF-330 packages are due by 2:00 PM PT on December 9, 2019. <u>https://bata.sam.gov/onp/bb38175hf9285362926cd9c6dfec51/uie</u>

EMERGENCY RESPONSE BOAS TO CONTAIN/CLEAN UP/MITIGATE EFFECTS OF OIL/HAZARDOUS SPILLS IN WATERWAYS UNDER USCG JURISDICTION Department of Homeland Security, U.S. Coast Guard, Norfolk, VA. Contract Opportunities from Beta-Sam.gov, Solicitation 70208420R100001, 2019

The U.S. Coast Guard's Shore Infrastructure Logistics Center seeks to identify interested sources capable of providing emergency response services for containment, cleanup, and/or mitigation of the harmful effects of oil spills and hazardous substance incidents no or in waters encompassing the entire United States and its territories, including but not limited to Puerto Rico, Virgin Islands, Guarn, Mariana Islands, and American Samoa. The Coast Guard Intends to negotiate the another structure south. Respond by 4:000 PM ET on December 9, 2019. <u>Hitters/Interastructures/Interastr</u>

Cleanup News

FINAL REPORT: OTSEGO TOWNSHIP DAM AREA TIME CRITICAL REMOVAL ACTION, OPERABLE UNIT 5, AREA 3, ALLIED PAPER, INC./PORTAGE CREEK/KALAMAZOO RIVER SUPERFUND SITE U.S. EPA Emergency Response Branch, 106 pp, 2019

A time-critical removal action (TCRA) was performed within a 1.7-mi river reach of the Kalamazoo Superfund site to remove PCB sediments, bank soils, and a temporary water control structure (WCS), and to stabilize the channel under the new dam-out condition. The banks were restored using bioengineering techniques and riparian restoration to increase the strength of the bank treatment and reduce maintenance over time. Pre-design investigation activities allowed for significantly remediation and stemitenance over time. Pre-design investigation activities allowed for banks were restored using bioengineering techniques and on-site result of advected bank remediation and sediment volumes. Design and construction brought unique challenges to riverbank remediation and stabilization that required specific engineering/construction sources are stored bank remediation and sediment volumes. The pilot channel was dredged through unique challenges to riverbank remediation and sediment for unerse banks. The pilot channel directed the river flow to the center of the channel, preventing the potential for the channel to undermine the adjacent tseese polar and cause slope failure. Dredge spoils were re-located via pumping to the downstream side of the former dam spillway where a scour hole had previously formed and would, in the future, be relatively cut off from the main river channel. Since implementation of the rever shares and the constructed design functioned as a transments will increase in strength and provide a robust bank treatment that requires minimal maintenance over time. See Otsego Township Dam section to download zin file that includes attachments, flaures, and final report; <u>bites / thware</u>, <u>adfinal report; bites / thware</u>, <u>adfinal report; <u>bites / thware</u>, <u>adfinal report</u></u></u></u></u></u></u></u></u>

TRICHLOROETHENE VAPOR INTRUSION CONCEPTUAL SITE MODEL DEVELOPMENT AND MITIGATION IN A COMPLEX GEOLOGY Parker, J. and J. Crum. | Great Lakes Environmental Remediation & Redevelopment Conference, 16-18 October, Lansing, MI, 33 slides, 2019

Historical commercial activities at an orphaned site in Michington & Received primer Contenter, por Concerte, por Sales, por Sales,

DECONTAMINATION OF PFAS IMPACTED INFRASTRUCTURE AND FULL-SCALE TREATMENT OF PFAS IMPACTED WASTEWATER USING OZOFRACTIONATION WITH TREATMENT VALIDATION USING TOP ASSAY Ross, 1, 5. Manivannan, E. Houtz, J. McGonough, and P. Storch. Real Property Institute of Canada Federal Contaminated Stites Regional Workshop, 4-5 June, Halifax, NS, 38 slides, 2019

Loss of concentrated aqueous film-forming foam at Brisbane Alrport in Queensland resulted in PFAS impact to domestic/industrial sewer and stormwater systems and nearby surface water. The sewer and stormwater systems were subsequently isolated to prevent further impact on the environment. About 6 million liters (ML) of wastewater and 6 ML of stormwater were collected, contained in 20 m ³ capacity tanks, and treated to a concentration of 99.9% of PFAS was routinely achieved. The system reliably removed long-chain and short-chain PFAS < 2 µg/L. To reach the final treatment objective, a membrane filtration system was installed to reduce concentrations reliably < 0.25 µg/L To reach the final treatment objective, and membrane filtration system was installed to reduce concentrations reliably < 0.25 µg/L To reach the final treatment objective, and membrane filtration system was installed to reduce concentrations reliably < 0.25 µg/L To reach the final treatment objective, and embrane filtration system was installed to reduce concentrations reliably < 0.25 µg/L To reach the final treatment objective, and embrane filtration system was installed to reduce concentrations reliably < 0.25 µg/L To reach the final treatment objective, and embrane filtration system was installed to reduce concentrations reliably < 0.25 µg/L To reach the final treatment objective, and embrane filtration system was installed to reduce concentrations reliably < 0.25 µg/L To reach the final treatment objective, and embrane filtration system was installed to reduce concentrations reliably < 0.25 µg/L To reach the final treatment objective, and embrane filtration system was installed to reduce concentrations reliably < 0.25 µg/L To reach the final treatment objective, and embrane filtration system was installed to reduce concentrations reliably < 0.25 µg/L To reach the final treatment objective, and embrane filtration system was installed to reduce concentrations reliably < 0.25 µg/L To reach the final treatment objective, and treated to reduce con

Demonstrations / Feasibility Studies

INTERIM MEASURES FINAL REPORT FOR SOIL-VAPOR EXTRACTION OF VOLATILE ORGANIC COMPOUNDS FROM MATERIAL DISPOSAL AREA L, TECHNICAL AREA 54 U.S. DOE, Office of Environmental Management, EM2018-0008, 124 pp, 2018

In 2015, a soil-vapor extraction (SVE) system operated at two vapor extraction wells in Material Disposal Area (MDA) L, Technical Area 54 of Los Alamos National Laboratory. Within 10 months, the two SVE units removed 1,217 lbs of total organic vapor mass, primarily from within a ~150-ft radius surrounding the extraction wells. Following the initial 10-mo SVE operation, short-duration rebound testing was performed in 2016 (2 days) and 2017 (25 days). Pore-gas sampling results collected within the 150-ft radius of the SVE units removed 1,217 lbs of total value a 3D model of the site, explore scenarios of hypothetical future releases, and present suggestions to support the selection and design of a final remedy for MDA L.

IN SITU LASER-INDUCED FLUORESCENCE: NOVEL APPLICATIONS FOR CONTAMINATED SEDIMENTS CHARACTERIZATION Sweet, B., K. Davidson, and C. Lake. | RemTech 2019: Remediation Technologies Symposium, 16-18 October, Banff, 18 slides, 2019

Recent research has explored the potential of an in situ laser-induced fluorescence technique to spatially delineate organic-rich industrial sediments contaminated with dioxins and furans to collect unique optical signatures of materials based on their physicchemical properties. Lab and field work were conducted at a stabilization basin that has received industrial wastewater over the past 50+ years in Nova Scotla, Canada. Preliminary lab and field testing on sediments within the basin served as proof of concept for the application. The system's performance was compared to standard gravity cores; the results of which are included in the presented attribution. This system's performance was compared to standard gravity cores; the results of which are included in the presented attribution. This system's performance was compared to standard gravity cores; the results of which are included in the presented attribution. This system's performance was compared to standard gravity cores; the results of which are included in the presented attribution. This system has the policital to vertically delineate the presence or absence of contaminated sediments, which will assist in producing more accurate volume estimates for some and the standard gravity cores. Lab second attribution attribute the standard device the sta

NUCLEAR MAGNETIC RESONANCE LOGGING: EXAMPLE APPLICATIONS OF AN EMERGING TOOL FOR ENVIRONMENTAL INVESTIGATIONS Spurin, M.S., B.W. Barker, B.D. Cross, and C.E. Divine. Remediation 22():65-73(2):109)

Several nuclear magnetic resonance (NMR) field investigations were conducted to demonstrate the technology's viability as a site characterization tool for near-surface investigations. Use of NMR to detect vadose zone water provided hydrostratigraphic details that were used to evaluate drainable pore water versus pore water bound by capillary forces or electrochemically clay-bound water. While NMR produced hydraulic conductivity estimates like those from conventional hydraulic tests, it improved vertical resolution to provide additional information regarding the vertical heterogeneity of the formation along the entire length of the well or borehole. Bench-scale tests are presented that confirm NMR capability to reliably detect and quantify LNAPL saturation in situ. <u>https://nnineliharg.value.com/chi/end/10.1002/rem.21590</u>

FIELD PILOT STUDIES FOR IN SITU STABILISATION/SOLIDIFICATION (IISS) OF HYDROCARBON CONTAMINATED SEDIMENTS IN KENDALL BAY, SYDNEY, NEW SOUTH WALES (NSW), AUSTRALIA Clutterham, M., A. Nolan, R. Denny, P. Hutson, C. Robb, and D. Meric. TIDH Tinternational Conference on the Remediation and Management of Contaminated Sediments, 11-14 February, New Orleans, Louisiana, 25 sildes, 2019

Sediments in Kendall Bay were contaminated with PAHs and total recoverable hydrocarbons from the former Mortiake operations on the bay's shore. In situ stabilization/ solidification (ISS) was selected as the remediation technology, which reduced the need to move contaminated material for off-site treatment and disposal and the potential for odor emissions associated with traditional dredging approaches. A Phase 1 lab treatability study identified the optimal additive mix design explored the need to move contaminated material for off-site treatment and disposal and the potential for odor emissions associated with traditional dredging approaches. A Phase 1 lab treatability study identified the optimal additive mix design explored the contaminated material for off-site treatment properties and contamination as the remediation areas. The Phase 3 work involved the contaminated material for odor emissions associated with traditional dredging approaches. A Phase 1 lab treatability study identified the optimal additive mix design explored the contamination as the remediation areas. The Phase 3 work involved the contamination of a 1.5 m- thick ISS reft to remediate contaminated ediments and 8 deeper ISS columns for structures apport and contaminated ediments and 8 deeper ISS columns for structures apport and contaminated ediments and 8 deeper ISS columns for structures apport and contaminated ediments. The Phase 3 work involved the constructuation 2/1014 sediments contamence more interactures and a deeper ISS columns for structures apport and contaminated ediments. The Phase 3 work involved the constructures contamence more interactures and a deeper ISS columns for structures apport and contaminated ediments. The Phase 3 work involved the constructures contamence contaminated ediments and 8 deeper ISS columns for structures approximated approximation of 1.5 m- thick ISS reft to remediate contaminated ediments. The Phase 3 work involved the constructures contamence contaminated ediments and 8 deeper ISS columns for struc

Research

SUCCESSFUL SCALE-UP AND DESTRUCTION OF PFAS IN SOIL VIA BALL MILLING Battye, N., L. Turner, O. El-Sharnouby, D. Patch, K. Jaansalu, B. Kueper, and K. Weber. Real Property Institute of Canada Federal Contaminated Stites Regional Workshop, 4-5 June, Halifax, NS, 25 slides, 2019

A study employed ball milling to destroy PFAS in soils from a 50+-year-old firefighting training area and silica-based sand spiked with PFAS. The mechanical action of milling promotes reactivity and surface chemistry states that are not attainable in ambient conditions. Three different-sized ball mills were used to evaluate and demonstrate escalability. A suite of 13 PFAS compounds spanning and extending beyond those with Canadian guidance values were tracked in all cases. Results demonstrate up to 97% of PFAS destruction with minutes in two types of soil, sand, and clay, and no identifiable PFAS products were produced. This patent-pending, we situ remediation technology for PFAS-contaminated soils will be scaled on-site to develop detailed operational requirements. https://www.rpic.ibic.ca/imagas/2019_FCSRW/presentations/Successful_Scale.up.and_Destruction_of_PFAS_in_Soil_Via_Ball_Milling.pdf

POLYMER SUPPORTED CARBON FOR SAFE AND EFFECTIVE REMEDIATION OF PFOA- AND PFOS-CONTAMINATED WATER Lundquist, N.A., M.J. Sweetman, K.R. Scroggie, M.J.H. Worthington, L.J. Esdaile, et al. ACS Sustainable Chemistry & Engineering 7(13):11044-11049(2019)

In this study, a suffur polymer support was added to powdered activated carbon (PAC) to overcome commonly experienced dust generation and caking issues that can block filters when using PAC to remediate contaminated water. sorbent/PAC mixture was used to remediate artificial water contaminated with PPOA and PPOS. Fundamental discoveries of PPOA self-assembly are also reported, as well as testing on a field sample of contaminated water.

STOCHASTIC COST-OPTIMIZATION AND RISK ASSESSMENT OF IN SITU CHEMICAL OXIDATION FOR DENSE NON-AQUEOUS PHASE LIQUID (DNAPL) SOURCE REMEDIATION Kim, U., J.C. Parker, and R.C. Borden. Stochastic Environmental Research and Risk Assessment 33(1):73-89(2019)

A computer program was developed to optimize in situ chemical oxidation (ISCO) design to meet specified source zone remediation objectives at DNAPL sites. In addition to the remediation objectives, the program determined optimal design parameters to meet remediation cost and took uncertainty in site characterization data and model predictions into consideration. The ISCO model was implemented in the Stochastic Cost Optimization Toolkit. ISCO design parameters conside for optimization include oxidant concentration and injection rate, frequency and number of soil or groundwater samples, and cleanup criteria for subregion injection. Sensitivity studies and example applications are presented to demonstrate the benefits of the proposed stochastic optimization methodology. The Stochastic Cost Optimization Toolkit can be accessed via <u>http://scotoolkit_csubho.edu/</u>. See more on this SERDP-sponsored project at <u>http://www.setur.estor.astic.cost.ptimization.estor.estor.astic.cost.ptimization.estor.estor.astic.cost.ptimization.estor.estor.astic.cost.ptimization.estor.estor.astic.cos</u>

A PORE-SCALE INVESTIGATION OF HEAVY CRUDE OIL TRAPPING AND REMOVAL DURING SURFACTANT-ENHANCED REMEDIATION Ghosh, J., G.R. Tick, N.H. Akyol, and Y. Zhang. Journal of Contaminant Hydrogoy 223: 103471(2019)

A pore-scale study was conducted to understand and quantify the trapping and noblication mechanisms and in altu emulalification processes of heavy orule all distributed within increasing complexity unconsultated such aduring. suffactant-inhibition. Pore-scale imaging analyses quantified the changes in oil blob morphology before and after suffactant flushing, whet to assist the primary factors that to control the accouncy. Results and a factor and the changes in oil blob morphology before and after suffactant flushing, whet to assist the primary factors that to control the accouncy. Results and end likely low (10%) of suffactant flushing, the end of the changes in oil blob morphology before and after suffactant flushing whet to assist the primary factors that control the accouncy. Results and reliable primarily consistent and medium primarily consistent of small disconted blobs more readily exposed than the suffactant flushing. Heterogeneous sand experiments, an average of 20% heavy-or increasing of 10% heavy-resulted after each flushing event (total of ~37% after 5 PVs) and was attributed to a more efficient reduction of interfacial tension associated with the increased suffactant-oil contact. The associated hemesting and the primary consistent of and the suffactant flushing. Weater-weat provide medium suffactant and the increased suffactant-oil contact. The associated hemesting and primary constraints and the suffactant flushing and the increased suffactant-oil contact. The associated higher pH sand/fine-carbonate system may have aided in maintaining a water-weat provide medium suffactant and the increased suffactant of the increased suffactant-oil contact. The associated higher pH sand/fine-carbonate system may have aided in maintaining and water-weat provide suffactant and the suffactant flushing.

APPLICATION OF AN EMULSIFIED POLYCOLLOID SUBSTRATE BIOBARRIER TO REMEDIATE PETROLEUM-HYDROCARBON CONTAMINATED GROUNDWATER Lee, T.-H., D.C.W. Tsang, W.H. Chen, F. Verpoort, Y.T. Sheu, and C.M. Kao. Chemosphere 219:444-452(2019)

An emulsified polycolloid substrate (EPS) was developed and applied to form a biobarrier for the containment and enhanced bioremediation of a toluene-contaminated groundwater plume. EPS had a negative zeta potential (-35.7 mv), which promoted its even distribution after injection. Batch and column experiments conducted to evaluate the effectiveness of EPS on toluene containment and biodegradation resulted in a partition coefficient of 943. Groundwater containing toluene [18 mg/L] was pumped into the three-column system at a flow rate of 0 28 mL/min, while EPS was injected in to the second column to from a biobarrier. A significant reduction of foluene concentration to 0.1 mg/L was observed atmendiately after EPS injection, indicating its effectiveness to contain the toluene plume and prevent migration farther downgradient. About 99% of toluene was removed after 296 pore volumes of operation via sorption, natural attenuation, and EPS supplement. Supplement of EPS resulted in a growth of petroleum-hydrocarbon degrading bacteria, which enhanced the toluene biodegradation.

General News

BROWNFIELDS FEDERAL PROGRAMS GUIDE, 2019 EDITION U.S. EPA, Office of Land and Emergency Management, Washington, DC. EPA 560-B-19-001, 134 pp, September 2019

This guide updates the 2017 edition to aid in the cleanup and redevelopment of brownfields. Each federal agency or organization involved is summarized with respect to its mission and connection to brownfields. Each summary identifies relevant programs organized according to whether technical or financial assistance is available. Where applicable, a description is provided of eligibility requirements, availability, uses, and applications, as well as any restrictions on use or eligibility. "Snapshots" of brownfield scleanup and redevelopment" explains options for using federal tax incentives and bringing state and local partners into the funding mix. Tapping into these additional funding sources often can provide the additional resources that a brownfield scleanup and redevelopment" explains options for using federal tax incentives and bringing state and local partners into the funding mix. Tapping into these additional funding sources often can provide the additional sources by considering mix. Tapping into these additional funding sources often can provide the additional early for its success by considering the many options available for technical assistance. This guide provides a useful tool. A quick-reference table gives an overview of brownfields General programs to help narrow the search for assistance.

FUNDAMENTALS OF ENVIRONMENTAL SITE ASSESSMENT AND REMEDIATION Rong, Y. (ed). CRC Press, Boca Raton, FL. ISBN: 978-1-138-10515-7, 340 pp, 2018

In 12 chapters, this book examines all aspects of environmental site assessment and remediation and outlines the interdisciplinary skills needed for field assessments. Included is a comprehensive overview for students, environmental professionals, and real sets developers, as well as recent information on environmental requestions, environmental site assessment and remediation practices, and industry standards. Topics covered induce pollution sources, related impacts on drinking water supplies, and associated health risks; how to protect water resources; surface water, groundwater, and soil monitoring; and vapor intrusion. Practical case studies are also provided. See a preview of the book at https://content taylortancic.com/houks/adv/adv/1115/1115/1115012

GREENER CLEANUP METRICS U.S. EPA Engineering Forum Greener Cleanup Workgroup, CLU-IN Website, 2019

EPA's "Principles for Greener Cleanups" [https://www.epa.gov/greenercleanups] provide a foundation for planning and implementing cleanups that protect human health and the environment while minimizing the environmental footprint of cleanup activities. EPA has developed 14 greener cleanup metrics to use to guantify specific portions of the footprint, such as the amounts of refined materials, public water, or diesel fuel that are used or the amount of waterwater and hazardous waste that is generated. The metrics provide an optional means for regulators, private industry and other cleanup partners to collect and track sites. Feedfic footprint. A spreadsheet to help the cleanup stakeholders identify best management practices that could be implemented to minimize the footprint. A spreadsheet tool, the Excel-based Greener Cleanup Metrics Workbook, is available to help parties document and report the metrics. <u>This://clian.margement.practices.preadsheet.preadsh</u>

ADVANCES IN MANAGING CONTAMINATED GROUNDWATER USING HIGH RESOLUTION SITE CHARACTERIZATION AND CONTAMINANT MASS FLUX REDUCTION Mok, C.M. and P. Kulkarni. | SERDP & ESTCP Webinar Series, Webinar #101, October 2019

SERDP and ESTCP sponsored two presentations on managing contaminate groundwater. The first presentation featured hydraulic tomography (HT), a cost-effective high-resolution site characterization technique to delineate the spatial distributions of hydraulic conductivity and storativity. A field-scale demonstration confirmed that HT can be readily applied at other DoD sites using existing networks of groundwater extraction/injection and observation and observation and observation and observation and observation and optimization. The second presentation described a recentled as applications for remediation reliability evaluation and optimization. The second presentation described are recentled as applications for remediation reliability evaluation and optimization. The second presentation described are control control and and applications for remediation reliability evaluation and optimization. The second presentation described are recentled are readily applied estimated as applications for remediation reliability evaluation and optimization. The second presentation described are recentled are readily applied estimated as applications for remediation reliability evaluation and optimization. The second presentation described are recentled are readily applied estimated as applications for remediation reliability evaluation and optimization. The second presentation described are recentled are readily applied estimated are readily applied estimated as applications for readil optimization for the permeation grouting technology, 2) a permeation grouting decision flowchart, and 3) an overview of the ESTCP Source Barrier Toolkit, three second presentation described are readily applied estimated are

RECENT ADVANCES IN SURFACTANT-ENHANCED IN-SITU CHEMICAL OXIDATION FOR THE REMEDIATION OF NON-AQUEOUS PHASE LIQUID CONTAMINATED SOILS AND AQUIFERS Besha, A.T., D.N. Bekley, R. Naidu, and S. Chadalavada Environmental Technology & Innovation 9:303-322(2018)

This review introduces surfactant enhanced in situ chemical oxidation (S-ISCO) technology and compares it to traditional in situ chemical oxidation. An overview of the three most important components of S-ISCO (surfactant/co-solvent mixtures, the catalyst and/or the oxidant and the free radicals) and major factors affecting the application of S-ISCO of the remediation of contaminated sites are included. The review concludes with a detailed explanation of the recent case studies and field applications of S-ISCO and factors affecting its implementation.

THE 35TH ANNUAL INTERNATIONAL CONFERENCE ON SOILS, SEDIMENTS, WATER AND ENERGY, 21-14 OCTOBER 2019, UNIVERSITY OF MASSACHUSETTS AT AMHERST: ABSTRACT BOOK The Association for Environmental Health & Sciences (AEHS) Foundation, 201 pp, 2019

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REMEDIATION OF MERCURY CONTAMINATED SOIL, WATER, AND AIR: A REVIEW OF EMERGING MATERIALS AND INNOVATIVE TECHNOLOGIES Wang, L., D. Hou, Y. Cao, Y. OK, F.M.G. Tack, J. Rinklebe, and D. O'Connor Environmental International (Published online 11 November 2019 prior to print)

Recent developments in technological approaches for the remediation of Hg-contaminated soil, water, and air with a focus on emerging materials and innovative technologies are covered in this publication. Emerging materials include various nanomaterials graphene, biochar, metal organic frameworks, covalent organic frameworks, layered double hydroxides as well as other materials such as day minerals and manganese oxides. The performance of innovative technologies, such as adsorption/discorption, oxidation/reduction and stabilization/containment, with the aid of these materials is then evaluated. In addition, the publication reviews technologies involving organisms, such as phytoremediation, algae-based mercury removal, microbial reduction, and constructed wetlands as well as the role of organisms in these techniques.

A REVIEW ON DECONTAMINATION OF ARSENIC-CONTAINED WATER BY ELECTROCOAGULATION: REACTOR CONFIGURATIONS AND OPERATING COST ALONG WITH REMOVAL MECHANISMS Köbya, M., R. Darvishi, C. Soltani, P.I. Omwene, and A. Khataee Environmental Technology R. Innovation 17:100519(2019)

Electrocoagulation (EC) applications, performance results, drawbacks, and limitations for As removal are the focus of this review. Topics covered include mechanisms and theoretical aspects; effects of operational parameters on the efficiency of the process, including current density, charge loading, and initial pH; reactor configurations and operacial applications of the process; bilded production, including characterization and disposal methods ; and the simultaneous As removal with other contaminants from water. The publication concludes with examples of pilot and full-scale applications of C for As removal and the outbook of this field of study with resect to new areas of research.

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 <u>adam michael@epa.gov</u> 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.