Technology Innovation News Survey

Entries for April 1-15, 2020

Market/Commercialization Information

SUBLICATING CAPACITY NEWS REVIEW, NEW BEDFORD HARBOR SUFINDUR SUPERFUND, NEW BEDFORD, MA
U.S. Army Corps of Engineers, New Bedford, MA.
Contact Opportunity at Beta.SAM, Solicitation W15QKN-20R00040.

This is a small business set-aside, NACS code 521910, size standard $15.5M. The U.S. Army Corps of Engineers - New Bedford District manages an independent subsistence capacitating review for the New Bedford Harbor Superfund Site, New Bedford, MA. Offers are due by 2:00 PM ET on May 26, 2020.

GROUNDWATER MONITORING & INTERMEDIATE REMEDIATION OPERATIONS, MAINTENANCE, AND MODIFICATIONS, KIRTLAND AIR FORCE BASE, NM
Hoffmann-La Roche Inc., 102 pp, 2020
Contract Opportunity at Beta.SAM, Solicitation W912W4-20-D-00027.

This is a small business set-aside, NACS code 521910, size standard $75M. The Kirtland Air Force Base, Bernalillo County, New Mexico. Services include: planning, permitting, regulatory compliance; collecting contaminant, geotechnical, hydrologic, and mechanical data; interpreting chemical data sets to make assessments of contaminant effects and exposure; conducting subsurface sampling and analysis; conducting community system upgrades; and preparing technical documents capable of supporting the corrective action plan, contractor and environmental studies tasks to the Government's direction and based upon the current site condition and need. Award will result in a firm-fixed-price service contract. Proposals are due by 2:00 PM PT on June 1, 2020.

R -- ENVIRONMENTAL SERVICES FOLLOW-ON
NASA Goddard Space Flight Center (GSFC), Greenbelt, MD.
Contact Opportunity at Beta.SAM, Solicitation 850Q2520D0002.

This is a small business set-aside, NACS code 521910, size standard $75M. The NASA Goddard Space Flight Center, Greenbelt, Maryland. Services include: planning, permitting, regulatory compliance; collecting contaminant, geotechnical, hydrologic, and mechanical data; interpreting chemical data sets to make assessments of contaminant effects and exposure; conducting subsurface sampling and analysis; conducting community system upgrades; and preparing technical documents capable of supporting the corrective action plan, contractor and environmental studies tasks to the Government's direction and based upon the current site condition and need. Award will result in a firm-fixed-price service contract. Proposals are due by 2:00 PM PT on June 1, 2020.

DEPARTMENT OF ENERGY OFFICE OF ENVIRONMENTAL MANAGEMENT SPECIAL PROCUREMENT NOTICE
DOE DN Environmental Management Consolidated Business Center, Cincinnati, OH.

U.S. DOE is providing updated procurement schedule information on all major Office of Environmental Management final RFP releases under NACS code 562910:

- Hanford Cleanup Project, no sooner than to be late May 2020.
- DOE Arizona Reservation Cleanup Contract (November 2020)

Cleanup News

QUARTERLY OPERATIONS REPORT THIRD QUARTER 2019 SOIL VAPOR EXTRACTION CONTAMINATION SYSTEM, SITE 1 FORMER DRUM MARSHALLING YARD NYWPRP, BETHESDA, MD
Borden R.C., S.D. Richardson, and A.A. Bodour.
See YouTube video on the pilot:
https://www.youtube.com/watch?v=9189Mh97ElI

APPLICATION OF CHEMICAL REACTIONS AS INNOVATIVE REMEDIATION TECHNOLOGIES FOR GROUNDWATER IMPACTED BY PETROLEUM HYDROCARBONs IN ITALY

Demonstrations / Feasibility Studies

PHASE 2 PILOT STUDY COMPLETION REPORT: SHELL POND REMEDIATION PILOT STUDY PROJECT, BAY POINT, CALIFORNIA
Park Gas and Electric Company, 2019

Shell Point is a 72-acre wastewater impoundment that contains a surficial layer of material contaminated with PFAS, PCBs, and metals. The year-long Phase 2 pilot study tested the viability and practicality of using physiochemical and enhanced bioremediation as components of a combined remedy, including monitored natural attenuation, by assessing the potential for native plants to remediates contamination. The test also evaluated the effectiveness of the vegetative cover to prevent the release of dust and fugitive odors to the atmosphere. The pilot study involved developing a 10-acre portion of the pond and installing an Aquaclean R to keep the remaining water out. Izotop treated waste were used to evaluate remediation strategies and native plants, soils, sediments, and organisms for contaminant degradation and uptake. The pilot study was underwritten by Shell Point Services, Shell Point Services, and the U.S. Environmental Protection Agency.

PFAS TREATMENT FOR MUNICIPAL WATER SUPPLY: STRATEGY AND PILOT TESTING TO RESTORE GROUNDWATER IN ORANGE COUNTY, CALIFORNIA
Pumkin, R. E., Middle, R., Farno, J., Gustafson, G. M., Hines, A. W., and U.S. Army Corps of Engineers West, 2019

The Orange County Water District (OCWD) has launched the nation's largest pilot program to test various treatment options for PFAS in groundwater and a planning study to help retailers evaluate how to quickly implement treatment. While the Orange County Water District (OCWD) has been monitoring PFAS in groundwater for more than a decade, at this time, no direct regulatory action has been implemented. As PFAS contamination levels in Orange County groundwater are stable and not increasing, OCWD does not plan to implement any direct actions for PFAS treatment at this time. The OCWD's governance body, the Board of Directors, has agreed that a decision to implement treatment is subject to the results of the planning study. The April 2019 Planning Study Report included recommended actions and next steps to consider for the implementation of PFAS groundwater treatment.

ENHANCED REDUCED DECHLORINATION OF TRICHLOROETHYLENE IN AN ACIDIC DNAPL IMPACTED AQUIFER
Bono, R. S., Breuer, R. A., and Stout, S. N.

In-Situ Stabilization of PFAS Contaminated Soils at Two Superfund Sites
Borden R.C., S.D. Richardson, and A.A. Bodour.
Environmental Management 36:603-613(2019)

The overall objective of this laboratory-scale research project was to examine the potential for using low-cost, low-technology process for immobilizing and rendering PFAS contaminants non-hazardous. The project evaluated both natural and commercially available stabilizing agents, and the potential development of a chemical formulation for a new stabilizing agent. The research involved three steps: 1) conduct laboratory-scale partitioning treatability studies with up to four identified PFAS contaminants; 2) test the ability of the selected stabilizing agent to immobilize the identified PFAS contaminants; and 3) conduct laboratory-scale testing with the selected stabilizing agent formulation. The research demonstrated that low-cost, low-technology process for immobilizing and rendering PFAS contaminants non-hazardous is achievable and the research results are available for further evaluation.

PROOF-OF-CONCEPT FOR THE IN SITU TOXICITY TESTING EVALUATION (ITE) TECHNOLOGY FOR ASSESSING CONTAMINATED SEDIMENTS, REMEDIATION SUCCESS, RECONTAMINATION, AND PROTECTION OF MAJOR INFRASTRUCTURE

GROUNDWATER MONITORING & INTERMEDIATE REMEDIATION OPERATIONS, MAINTENANCE, AND MODIFICATIONS, KIRTLAND AIR FORCE BASE, NM
Hoffmann-La Roche Inc., 102 pp, 2020
Contract Opportunity at Beta.SAM, Solicitation W912W4-20-D-00027.

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This review examined the range of technologies to remediate petroleum hydrocarbons in subsurfaces with a specific focus on bioremediation and electrokinetic remediation and the efficiency of combining the two. Knowledge gaps of these technologies, as well as clay minerals and manganese oxides. The performance of adsorption/desorption, oxidation/reduction, and stabilization/containment using these materials are examined, as are technologies involving microorganisms.

Recent developments in technological approaches to remediate Hg-contaminated soil, water, and air are evaluated in this review, with a focus on emerging materials and innovative technologies. The article reviews extensive research on the practical and theoretical perspectives. The book also presents the state-of-the-art in waste-assisted bioremediation to improve soil quality and the remediation of petroleum hydrocarbons.

Water-deposited corncobs were isolated from an oil-waste emulsion that included a chloride preservative and were stabilized by graphene oxide to grow a strong, mesoporous capsule. The emulsions were successfully applied as a novel technology to absorb and sequester PFDA contamination in water. These capsules were decorated with amino groups to present a positively charged corona that attracted the negative PFOA molecules. PFDA removal by the capsules was nearly quantitative within 24 hours in water-saturated soil columns. Aqueous adsorption isotherms determined using high-performance liquid chromatography and liquid chromatography-mass spectrometry showed that the uptake capacity of the capsules was increasing with the pH of the solutions.

The study found that the removal of PFOA by the capsules was greater than 99.9% in aqueous solutions. The capsules were also effective in removing PFOA from soil columns, with the removal efficiency decreasing as the pH of the solution increased. The study concluded that the capsules showed promising potential for the simultaneous treatment of PFDA and other emerging pollutants in aqueous and solid matrices.

Several control samples were prepared and used as selective adsorbents to remove residual petroleum hydrocarbons from surfactant-enhanced soil washing effluents. The study first characterized the adsorbent structure and optimal conditions. After five cycles, the recovery efficiency of the washing effluents was as high as 75.4%. The optimal adsorbent linear alkylbenzene sulfonates (LAS-Cb) also exhibited excellent recyclability and could be reused five times. The study concludes with proposed selective adsorption mechanisms of the LAS-Cb for petroleum hydrocarbons in washing effluents, which are related to their huge hydrophobic core and surface electronegativity.

Three potential methyl t-butyl ether (MBE)-degrading bacterial strains isolated from hydrogenated-contaminated soil were tested for MBE degradation ability, in vitro and in vivo bio-control activity, and induced systemic resistance in tomato plants. The results showed that strain M. mucogenicum exhibited an overall high capacity for MBE degradation in the in vitro test. Under the in vitro conditions, strain M. mucogenicum achieved 99.9% MBE removal within 7 days. The strain also showed potential for MBE degradation in vivo, with shoot biomass increased by 15.8% compared to the control. The study demonstrates the potential of M. mucogenicum as a biocontrol agent for soil remediation.

The system separates chemical classes of contaminants of concern frequently linked to adverse biological effects at DoD sites. The overall objective of the proposed project was the proof-of-concept of an accurate field methodology for in situ bioremediation at DoD sites. This SEED project addressed DoD’s critical need for effective monitoring tools to provide certainty in the decision-making process on critical risk determination components, such as causality, bioavailability, source identification, and fate across a wide range of contaminants. In a biological, laboratory-constructed test, the project successfully achieved in situ bioremediation of chlorinated solvents and PAHs, with H2O2 addition, with minimal or no environmental impact. The system also demonstrated a proof-of-concept for in situ bioremediation of six chlorinated solvents and PAHs in a bioremediation test.