Technology Innovation News Survey

Entries for September 1-15, 2017

Market/Commercialization Information

ENGINEERING DESIGN OF MUD PIT CAP REPAIR AT THE AMCHITKA, ALASKA SITE

Department of Energy, Navarro Research and Engineering Inc., North Las Vegas, Nevada.
Federal Business Opportunities, FBO-5802, Solicitation 6777-PZ, 2017

This solicitation is intended to procure engineering design services and construction support for repair and modification of engineered caps at the U.S. DOE mud pit sites on Amchitka Island, Alaska. These services shall be provided by an engineer registered in the state of Alaska. The mud pit caps addressed by this solicitation were installed in 2001 to remediate the areas where drilling was performed in support of three underground nuclear tests conducted on Amchitka during the late 1960s and early 1970s by DoD and the U.S. Atomic Energy Commission. The composition of the drilling mud used at Amchitka included 91-93% freshwater, 6-8% oil, and other additives, including cement, bentonite, diesel fuel, paper, chrome lignosulfonate, chrome lignite, and sodium bicarbonate. Seven engineered caps were constructed over a total of 12 mud pits. Each mud pit was stabilized by removing standing water and mixing solidification soils into the drilling mud. Proposals must be received by 4:30 PM MT on November 15, 2017. https://www.fbo.gov/spg/DOE/SNJV/NNSANV/6777-PZ/listing.html

TECHNICAL SUPPORT FOR UNDERGROUND FIELD CONSTRUCTED TANKS AT THE RED HILL BULK FUEL STORAGE FACILITY

U.S. Environmental Protection Agency, Region IX, San Francisco, CA.
Federal Business Opportunities, FBO-5798, Solicitation SOL-R9-17-00008, 2017

This acquisition is unrestricted under NAICS code 541620. The Red Hill Underground Fuel Storage Facility, owned and operated by the U.S. Navy, is a complex of 20 very large field-constructed underground storage tanks, four less large tanks, and associated piping networks and support facilities located at and near Pearl Harbor on the island of Oahu in Hawaii. In 1940-1943 the Navy tunneled into the volcanic mountain and constructed the tanks inside it. Each tank is ~250 ft high and 100 ft in diameter, with a storage capacity of about 12.5 million gal. The purpose of this contract is to secure advice and technical support from a tank industry expert for U.S. EPA, the Hawaii Department of Health, the Navy, and the Defense Logistics Agency (DLA). The Navy and DLA must perform evaluations in the areas of (1) tank inspection, repair, and maintenance; (2) technologies to upgrade the design and operation of the tanks; (3) determining the extent and effects of metal corrosion and fatigue on tank operations; (4) leak detection technologies and practices; and (5) facility risk assessment. The contractor shall provide expert advice on tank industry standards and practice, provide initial input to the Navy and DLA as they develop deliverables, and review the deliverables. The contract will run from January 2018 through December 2022. Proposals must be received by 9:00 PM ET on November 3, 2017. For updates, visit FedConnect at https://www.fedconnect.net/FedConnect/?doc=SOL-R9-17-00008&agency=EPA [Note: It might be necessary to copy and paste the URL into your browser for direct access].

MISSILE MISHAP RESPONSE TEAM (MMRT)

Department of the Air Force, Air Force Materiel Command, AFNWC - Hill AFB, Utah.
Federal Business Opportunities, FBO-5804, Solicitation FA8214-18-R-MMRT, 2017

The Air Force is conducting market research to determine if responsible sources exist in order to determine the best acquisition strategy for this procurement, with particular interest in small business types that fall under NAICS code 562211. The Air Force Nuclear Weapons Center is responsible for operation and sustainment of Minuteman III Intercontinental Ballistic Missiles (ICBM) as well as some parts of the Rocket Systems Launch Program. If an ICBM liquid or solid rocket motor incident occurs during loading or transportation, rapid response and assistance requires a competent team responsible for (a) vehicle recovery and (b) containment, cleanup, remediation, transportation, and disposal of all hazardous waste (e.g., Explosive Classification Class 1.3; solid propellants; monomethyl hydrazine nitrogen tetroxide (MMH); and diesel fuel/vehicle fluids) generated during real-world mishaps. As it is important to perform these services in a timely and competent manner, the team must complete up to four exercises per year that simulate real-world mishaps. The contractor must be capable of proper recovery, transportation, and disposal of up to 150,000 lbs of 1.3 explosive materials; 15,000 lbs of 1.1 hazardous materials; and up to 300 gallons of diesel fuel using rotator-type crane/wrecker. The contractor must be able to recover vehicles of a size up to a commercial diesel truck. Capability statements are due by 4:00 PM MT on October 26, 2017. https://www.fbo.gov/spg/USAF/AFMC/OOALC/FA8214-18-R-MMRT/listing.html

FY18 GUIDELINES FOR BROWNFIELDS PROGRAM GRANTS

U.S. Environmental Protection Agency, 2017

EPA's Brownfields Program provides funds to empower states, communities, tribes, and nonprofits to prevent, inventory, assess, clean up, and reuse brownfield sites. For the following types of grants, the closing date for applications is November 16, 2017.

- **Assessment Grants:** EPA-OLEM-OBLR-17-07. FY18 Guidelines for Brownfields Assessment Grants is posted at http://www.epa.gov/grants/fy-2018-guidelines-brownfields-assessment-grants. About 145 awards are anticipated from the estimated total program funding of $33.5M. http://www.grants.gov/web/grants/view-opportunity.html?oppId=297558
- **Revolving Loan Fund Grants:** EPA-OLEM-OBLR-17-08. FY18 Guidelines for Brownfields Revolving Loan Fund Grants is posted at http://www.epa.gov/grants/fy-2018-guidelines-brownfields-revolving-loan-fund-grants. About 15 awards are anticipated from the estimated total program funding of $9M. http://www.grants.gov/web/grants/view-opportunity.html?oppId=297557
- **Cleanup Grants:** EPA-OLEM-OBLR-17-09. FY 2018 Guidelines for Brownfields Cleanup Grants is posted at https://www.epa.gov/grants/fy-2018-guidelines-brownfields-cleanup-grants. About 38 awards are anticipated from the estimated total program funding of $7.5M. http://www.grants.gov/web/grants/view-opportunity.html?oppId=297578

Cleanup News

NEW NOTICE OF APPLICABILITY OF GENERAL WASTE DISCHARGE REQUIREMENTS FOR IN-SITU REMEDIATION ZONES AND THE NORTHWEST FRESHWATER INJECTION SYSTEM, PACIFIC GAS AND ELECTRIC COMPANY'S HINKLEY COMPRESSOR STATION, SAN BERNARDINO COUNTY

Lahontan Regional Water Quality Control Board, 139 pp, 2016

This new notice authorizes discharges from three in situ remediation zones (IRZs)—the Source Area IRZ, South Central Re-injection Area, and Central Area IRZ—currently operated by PG&E to remediate Cr-contaminated groundwater. This notice also addresses discharges to the northwest freshwater injection system, which acts, along with the northern groundwater extraction system, to block westward migration of the Cr plume. The three operating IRZs are located at and near the compressor station to treat the higher concentration plume core area south of Highway 58 (Cr concentrations >50 ppb). Treatment involves injecting carbon-containing compounds (e.g., ethanol) into the groundwater via injection wells to provide a food source that stimulates microbial and chemical processes to convert soluble, toxic Cr(VI) to solid, low-toxicity Cr(III) through chemical reduction. The solid Cr(III) remains bound to aquifer sediments as a mineral solid. The reducing environment in the aquifer also dissolves naturally occurring metals in the aquifer sediments, such as Mn, As, and Fe. Six years of monitoring data indicate that of the three dissolved metal by-products, Mn typically travels the farthest in groundwater. In response to Mn detections over threshold levels at certain contingency monitoring wells, the Discharger has scaled back ethanol injections and installed Mn mitigation. Reducing the amount of ethanol injected into groundwater reduces concentrations of byproducts in groundwater but also diminishes the efficiency of the IRZ remediation system to convert Cr(VI) to Cr(III). https://www.waterboards.ca.gov/rwqcb6/water_issues/projects/pge/docs/hinkley/pge_noa_r6v_2008_0014.pdf

CORRECTIVE ACTION IMPLEMENTATION REPORT, 1520 N. BARWISE, WICHITA, KANSAS

Kansas Dept. of Health & Environment, Bureau of Environmental Remediation, 216 pp, 2017

The project site consists of a 0.7-acre parcel on which a single building occupies about one-quarter of the property. A concrete paved material storage yard comprises the area south of the building where remedial injections of chemical oxidants to address PCE and daughter products were conducted. In October-November 2016 in accordance with the Corrective Action Plan (CAP), a pair of additional monitoring wells was installed in the injection zone. Fourteen pairs of injection wells, completed at two depth intervals, were installed prior to oxidant injection. Potassium permanganate solution was mixed at a ratio of 330 lb (6 buckets) of granular potassium permanganate to 1,600 gal of potable water. Four batches of injection solution were mixed for each pair of injection wells at a location. The injection event successfully delivered the planned volume and mass of oxidant to the target depths, which ranged from the water table to 25 feet bgs. Variability in pressures and volumes were within expected tolerances and no surfacing of injection solution or groundwater was observed. As presented in the CAP, real-time monitoring results for PCE and breakdown constituents will continue to be recorded and groundwater samples will be collected quarterly to monitor remediation progress. *See this report and subsequent monitoring documentation under* "**Documents/Photos Available**" *at* http://kensas.kdhe.state.ks.us/plsISL/ISL_Pub_Detail?id=C208771721.

Demonstrations / Feasibility Studies

FIELD SCALE PILOT STUDY OF CHROMIUM REDUCTION AND ERD IN A DECLARED AQUIFER
Snyder, J., F. Barranco, K. Min, and S. Saalfield.
RemTEC Summit, 7-9 March 2017, Denver, Colorado. 25 slides, 2017

A field-scale pilot test was performed to address groundwater contamination at an NPL site in Texas. Source areas associated with the groundwater plume include unlined floor sumps, disposal sumps, surface spills and leaks, and sludge drainage from unlined lagoons. These discharges released a Cr(VI) solute plume measuring 900 ft by 300 ft, consisting of "yellow" groundwater with concentrations in the hundreds of mg/L. Commingled with the Cr plume is a TCE plume with maximum concentrations of 1 to 2 mg/L, 400 ft wide by 1,400 ft long. The groundwater contamination occurs in a Texas Water Development Board-declared minor aquifer used as a local water supply source, although no water wells are located nearby. The pilot test consisted of injecting two separate carbon electron donors in two different areas with high concentrations of Cr and TCE. In each area, a fully penetrating injection well was installed with two downgradient observation points, each consisting of nested 5-ft screens separated by bentonite seals in a common borehole, and fully penetrating observation wells. In one area, electron donor was depleted before the Cr(VI) was fully reduced, but at the second test site, Cr(VI) was fully reduced, and enhanced reductive dechlorination (ERD) ensued, resulting in dechlorination of TCE to DCE, and on to VC. Over the course of the pilot, Cr(VI) apparently had to be completely reduced before the oxidation-reduction potential of the aquifer could drop to levels conducive to ERD of TCE.
Slides: http://www.remtecsummit.com/images/presentations/JaySnyder_Presentation.pdf **Longer abstract:**
http://www.remtecsummit.com/index.php/speakers/809-jay-snyder

ENHANCED DEGRADATION OF TCE ON A SUPERFUND SITE USING ENDOPHYTE-ASSISTED POPLAR TREE PHYTOREMEDIATION
Doty, S.L., J.L. Freeman, C.M. Cohu, J.G. Burken, A. Firrincieli, A. Simon, Z. Khan, J.G. Isebrands, J. Lukas, and M.J. Blaylock.
Environmental Science & Technology 51(17):10050-10058(2017)

Findings from a successful 3-year field trial of endophyte-assisted phytoremediation on the Middlefield-Ellis-Whisman Superfund Study Area TCE plume, Silicon Valley, Calif., show that poplar trees inoculated with a natural bacterial endophyte, *Enterobacter* sp. strain PDN3, exhibited increased growth and reduced TCE phytotoxic effects, with a 32% increase in trunk diameter compared to control poplars. The inoculated trees excreted 50% more chloride ion into the rhizosphere, indicative of increased TCE metabolism in the plants. Test-well groundwater analyses demonstrated a marked decrease in concentrations of TCE and its derivatives from the tree-associated groundwater plume. TCE concentration decreased from 300 µg/L upstream of the planted area to
https://depts.washington.edu/envaplab/papers/ES&T_Doty2017.pdf

REVISED GROUNDWATER PILOT TEST REPORT AND EXPANDED PILOT TEST WORK PLAN, QUAIL CROSSING NEIGHBORHOOD, ANDOVER, KANSAS
Kansas Dept. of Health & Environment, Bureau of Environmental Remediation, 649 pp, 2016

Contamination resulting from a release from a gasoline pipeline was discovered at the site in June 2012. This report documents groundwater pilot test activities performed from March 2015 through February 2016 and evaluates data collected to develop conclusions regarding the viability of ORC® as a remedial technology at the site. Work performed as part of the pilot test included injection of ORC Advanced® in March 2015 and collection and analysis of groundwater samples from monitoring wells in the release vicinity in March, April, June, August, November, and December 2015, and in February 2016. Pilot test data collected during the period March 2015 through February 2016 indicate that application of ORC Advanced led to increased aerobic degradation of dissolved-phase petroleum conditions in the vicinity and hydraulically downgradient of the ORC injections. Measurable changes in groundwater quality were noted 3 to 6 months after ORC introduction and continued through February 2016. Accordingly, this report contains a proposal for an expansion of the pilot test. The expanded pilot test includes the introduction of a more concentrated form of ORC Advanced, installation of a larger number of ORC Advanced injection borings to address residual dissolved-phase petroleum constituents in groundwater, and a longer pilot test time period.
http://www.kdheks.gov/remedial/site_restoration/download/Nustar_PilotTestRpt_WP.pdf

PILOT TESTING OF A BIOLOGICAL TREATMENT PROCESS (BIOTTTA™) FOR THE REMOVAL OF TCE, TCP, DBCP AND NITRATE
Metropolitan Water District of Southern California, 111 pp, 2016

The biottta™ system consists of two fixed-bed (FXB) biological processes in series along with specialized monitoring and chemical dosing algorithms, tailored media selection and configuration, and multiple biomass control tools. The FXB uses a stationary bed of granular activated carbon on which a bacterial biofilm develops. Water is drawn from a well, amended with an electron donor (acetic acid) and phosphorus, and then pumped across the media bed. To evaluate the effectiveness of using a two-stage fixed-bed biottta system to remove chlorinated VOCs and nitrate from groundwater, two parallel pilot studies were performed, one at the Chino Basin Desalter Authority (CDA) Chino Creek, and one at the Cucamonga Valley Water District (CVWD). Results showed that the biottta system can remove VOCs and nitrate effectively over sustained periods despite changes in water quality and operating conditions. Both projects remained on budget and the CVWD project remained on schedule, but unanticipated site challenges delayed the completion of the CDA pilot by almost 10 months. http://www.mwdh2o.com/FAF%20PDFs/3_GW_IEUA%20MWD%20Final%20Report%20BIOTTA.pdf

Research

EVALUATION OF CHROMATE REMOVAL BY GREEN IRON NANOPARTICLES IN A PILOT SCALE APPLICATION
Mystrioti, C., A. Toli, N. Papasiopi, A. Xenidis, and D. Dermatas.
CEST 2017: 15th International Conference on Environmental Science and Technology, Rhodes, Greece, 31 Aug - 2 Sep 2017. Paper 759, 5 pp, 2017

A pilot-scale tank with dimensions of 1.5 m (height) x 2.5 m (width) x 3.75 m (length) was filled with 24 tons of soil to evaluate Cr(VI) removal following the injection of green iron nanoparticles (GT-NZVI) and the formation of a reaction zone. A network of 48 sampling points was installed inside the tank to monitor the water quality. Nanoscale ZVI was synthesized on-site in 300-L batches. Following the injection of 2.8 m^3 GT-NZVI suspension via 3 injection wells to create a reaction zone perpendicular to groundwater flow, water containing 5 mg/L Cr(VI) was introduced. Pore water samples taken upstream and downstream of the reaction zone indicated that the zone operated effectively; all the downstream samples contained no Cr(VI), and Cr(tot) concentrations varied between
https://cest.gnest.org/sites/default/files/presentation_file_list/cest2017_00759_oral_paper.pdf

THE EFFECT OF HARVEST PERIOD ON THE TOTAL UPTAKE OF METALS BY WILLOWS AND POPLARS
Tlustos P., P. Kubatova, and J. Szakova.
CEST 2017: 15th International Conference on Environmental Science and Technology, Rhodes, Greece, 31 Aug - 2 Sep 2017. Paper 804, 4 pp, 2017

In 2008 and 2009 field experiments were set up on soil contaminated with Cd and Pb to evaluate the remediation potential of harvested mature willow and poplar trees and to take into account an autumn harvest of trunks, twigs, and leaves. The first harvest after four years of growth was about 3-fold lower than the harvest that followed two years later. The metal content in trunks and twigs correlated adversely with the yield. Biomass yield was more important for metal removal. The remediation factor reached up to 1% in the second harvest for Cd in willow, whereas Pb was a negligible 0.001% for both trees. Autumn harvest including leaves showed twice higher Cd removal than winter harvest for willows.
https://cest.gnest.org/sites/default/files/presentation_file_list/cest2017_00804_oral_paper.pdf

BIO-INDUCED REDUCTION OF CR(VI) IN AQUIFERS BY ORGANIC SUBSTRATES INJECTION
Mastorgio, A., S. Saponaro, and E. Sezenna.
CEST 2017: 15th International Conference on Environmental Science and Technology, Rhodes, Greece, 31 Aug - 2 Sep 2017. Paper 748, 5 pp, 2017

Bio-induced reduction of Cr(VI) to Cr(III) can be achieved by injection of organic substrates that are readily biodegraded by autochthonous microorganisms, resulting in reducing conditions. Lab-scale batch tests were carried out with two different soils (A and B) and solid/liquid ratios (25% and 50% on weight basis) at initial Cr(VI) concentrations of 5,000 or 10,000 µg/L. Ultrafiltration permeates of cheese whey and beer distillation residues provided the organic substrates. In all microcosms, dissolved oxygen decreased from about 6 mg/L to values
https://cest.gnest.org/sites/default/files/presentation_file_list/cest2017_00748_oral_paper.pdf

DESIGN OF SURFACTANT FOAM FLOOD FOR NAPL RECOVERY FROM SHALLOW SUBSURFACE
Stylianou, M., K. Kostarelos, A. Seyedabbasi, S.R. Lenschow, P.C. De Blanc, and A.G. Christensen.
CEST 2017: 15th International Conference on Environmental Science and Technology, Rhodes, Greece, 31 Aug - 2 Sep 2017. Paper 555, 5 pp, 2017

The generation of foam in situ using selected surfactant solutions was investigated to evaluate the feasibility of the process and foam stability. The foam-generating process—conducted by injecting 0.25 PV surfactant followed by 0.25 PV of air—required seven cycles of surfactant alternating with gas until foam was observed. The pressure drop was used to compute the apparent viscosity. During the flow experiment, no significant visible change of the sand pack was observed, although an increase in the differential pressure was measured after two cycles. During the third cycle, foam was observed at the first quarter of the column, and an additional increase in the differential pressure confirmed the creation of foam within the sand pack. Increases of the pressure drop through the cycles continued. The apparent viscosity ranged from 60 to 100 cP from the third to seventh cycle, respectively. After three days, foam was collected from the column exit as a proof of foam generation and to measure its stability.
https://cest.gnest.org/sites/default/files/presentation_file_list/cest2017_00555_oral_paper.pdf

TREATMENT OF CONTAMINATED MARINE SEDIMENTS BY SONOLYSIS

Fraiese, A., V. Naddeo, and V. Belgiorno.
CEST 2017: 15th International Conference on Environmental Science and Technology, Rhodes, Greece, 31 Aug - 2 Sep 2017. Paper 858, 4 pp, 2017

In a study of the effectiveness of sonication to abate organic contaminants in sediments, tests were carried out by ultrasound bath at different treatment timeframes and sonication frequencies. Treatment efficiency was evaluated in terms of removal percentage. The treatments demonstrated high percentages of degradation in all the tests, which were carried out in batch at two frequencies of sonication and five durations of treatment. These variations had little effect on contaminant reduction; the least aggressive treatment—5 minutes at 35 kHz—achieved removal of 89%. The highest degradation percentage achieved was 93% for B(alpha)P. Ultrasound treatment was able to obtain high percentage removal of organic contaminants without chemical solvent and at short timeframes. https://cest.gnest.org/sites/default/files/presentation_file_list/cest2017_00858_oral_paper.pdf

PHYTOVOLATILIZATION OF ORGANIC CONTAMINANTS

Limmer, M. and J. Burken.
Environmental Science & Technology 50:6632-6643(2016)

Fluxes of contaminants volatilizing from plants are important across scales ranging from local contaminant spills to global fluxes of methane emanating from ecosystems biochemically reducing organic carbon. Past studies were reviewed to differentiate between direct phytovolatilization from stems or leaves and indirect phytovolatilization from soil due to plant root activities, and the reviewers discuss the plant physiology driving phytovolatilization in different ecosystems. A discussion of current measurement techniques includes common difficulties in experimental design. Reports of phytovolatilization in the literature indicate that compounds with low octanol-air partitioning coefficients are more likely to be phytovolatilized. Reports of direct phytovolatilization at field sites compared favorably to model predictions. Suggestions for future research needs are presented that could better quantify phytovolatilization fluxes at field scale. http://pubs.acs.org/doi/pdf/10.1021/acs.est.5b04113

UNIQUE RHIZOSPHERE MICRO-CHARACTERISTICS FACILITATE PHYTOEXTRACTION OF MULTIPLE METALS IN SOIL BY THE HYPERACCUMULATING PLANT *SEDUM ALFREDII*

Hou, D., K. Wang, T. Liu, H. Wang, Z. Lin, J. Qian, L. Lu, and S. Tian.
Environmental Science & Technology 51(10):5675-5684(2017)

Understanding the strategies that the roots of hyperaccumulating plants use to extract heavy metals from soils is important for optimizing phytoremediation. The rhizosphere characteristics of *Sedum alfredii*, a hyperaccumulator, were investigated 6 months after it had been planted in weathered field soils contaminated with Cd (5.8 μg/g), Zn (1985.1 μg/g), Pb (667.5 μg/g), and Cu (698.8 μg/g). In contrast with the non-hyperaccumulating ecotype (NHE), the hyperaccumulating ecotype (HE) of *S. alfredii* was more tolerant of the metals and accumulated higher levels of Cd and Zn. The HE was characterized by a unique rhizosphere, including extensive root systems, a reduced soil pH, a higher metal bioavailability, and increased rhizomicrobial activity. The bioavailability of metals correlated significantly with the HE's unique bacterial communities (P

A MODIFIED APPROACH FOR IN SITU CHEMICAL OXIDATION COUPLED TO BIODEGRADATION ENHANCES LIGHT NONAQUEOUS PHASE LIQUID SOURCE-ZONE REMEDIATION

Fedrizzi, F., D.T. Ramos, H.S. C. Lazzarin, M. Fernandes, C. Larose, T.M. Vogel, and H.X. Corseuil.
Environmental Science & Technology 51(1):463-472(2017)

Field and batch experiments were conducted to assess whether a modified approach for in situ chemical oxidation (ISCO) can enhance LNAPL dissolution and produce bioavailable soluble compounds. The modified ISCO approach used MgO_2 and Fe_2O_3 particles recovered from acid mine drainage treatment and was coupled to biodegradation to further remove residual compounds by microbially mediated processes. Pure palm biodiesel (B100) was chosen to represent a poorly water-soluble compound that behaves like LNAPL, and 100 L was released to a 2 m^2 area excavated down to the water table. A past adjacent B100-field experiment under natural attenuation was used as a baseline control. Results demonstrated the enhancement of organic compound dissolution and production of soluble compounds due to the modified ISCO. The slow release of H_2O_2 by MgO_2 decomposition (partial chemical oxidation) and production of soluble compounds allowed the stimulation of microbial growth and promoted a beneficial response in microbial communities involved in oxidized biodiesel compound biodegradation.

RIPARIAN SPIDERS AS SENTINELS OF POLYCHLORINATED BIPHENYL CONTAMINATION ACROSS HETEROGENEOUS AQUATIC ECOSYSTEMS

Kraus, J.M., P.P. Gibson, D.M. Walters, and M.A. Mills.
Environmental Toxicology and Chemistry 36(5):1278-1286(2017)

Scientists examined whether riparian spiders might be used to track spatial patterns of sediment pollution by PCBs in aquatic ecosystems with high habitat heterogeneity. The spatial pattern of ΣPCB concentrations in 2 common families of riparian spiders sampled in 2011 to 2013 generally tracked spatial variation in sediment ΣPCBs across all sites within the Manistique River Great Lakes area of concern, a rivermouth ecosystem located on the south shore of the Upper Peninsula, Manistique, Mich., that includes harbor, river, backwater, and lake habitats. Two common riparian spider taxa (Araneidae and Tetragnathidae) were highly correlated ($r^2>0.78$) and had similar mean ΣPCB concentrations when averaged across all years. Results indicate that riparian spiders may be useful sentinels of relative PCB availability to aquatic and riparian food webs in heterogeneous aquatic ecosystems like rivermouths, where habitat and contaminant variability may make the use of aquatic taxa less effective.

GEOPHYSICAL LOGGING AND THERMAL IMAGING NEAR THE HEMPHILL ROAD TCE NATIONAL PRIORITIES LIST SUPERFUND SITE NEAR GASTONIA, NORTH CAROLINA

Antolino, D.J. and M.J. Chapman.
U.S. Geological Survey Open-File Report 2017-1017:1-47(2017)

Borehole geophysical logs and thermal imaging data were collected by the U.S. Geological Survey near the Hemphill Road TCE Superfund site near Gastonia, North Carolina, from August 2014 through February 2015. To assist U.S. EPA in the development of a conceptual groundwater model for the assessment of current contaminant distribution and future migration of contaminants, surface geological mapping and borehole geophysical log and thermal imaging data collection, which included the delineation of more than 600 subsurface features (primarily fracture orientations), was completed in five open borehole wells and two private supply bedrock wells. In addition, areas of possible groundwater discharge within a nearby creek downgradient of the study site were determined based on temperature differences between the stream and bank seepage using thermal imagery. https://pubs.usgs.gov/of/2017/1017/ofr20171017.pdf

SEDIMENT MANAGEMENT METHODS TO REDUCE DREDGING, PART 2: SEDIMENT COLLECTOR TECHNOLOGY

Thomas, R.C., J. McArthur, D. Braatz, and T.L. Welp.
ERDC TN-DOER-T13, 11 pp, 2017

This technical note presents an evaluation of sediment collector technology, a new device that may help to manage sediments and reduce traditional dredging requirements. The installation of sediment collector technology in Fountain Creek, Pueblo, Colorado, demonstrated that the technology worked with coarse sediments in a shallow unidirectional flow environment; had minimal maintenance costs over a 1-yr deployment; survived record floods with minimal damage; was capable of producing up to 100 yd3 per hour with a single 30-ft collector; and was relatively inexpensive and easy to deploy without specialized equipment. U.S. EPA funded the demonstration project. http://hdl.handle.net/11681/22150 *See also 12 slides at* https://s3.amazonaws.com/sitesusa/wp-content/uploads/sites/502/2016/07/mcarthur_10_17_12_Dredging2012_sediment_collector_thomas-2.5.pdf.

BASELINE ASSESSMENT OF PETROLEUM CONTAMINATION AND SOIL PROPERTIES AT CONTAMINATED SITES IN UTQIAGVIK, ALASKA

Barbato, R.A., S.L. Jarvis, K.L. Foley, and R.M. Jones.
ERDC/CRREL TR-17-13, 35 pp, 2017

Elevated contamination levels persisted for decades at the former Naval Arctic Research Station, particularly at the Airstrip and Powerhouse sites. Because of the challenging environmental conditions at the two sites, physical and chemical remediation technologies were not effective at reducing petroleum contamination levels. A deeper investigation of petroleum chemistry, soil attributes, and biological activity revealed heterogeneous contamination (aliphatic and aromatic hydrocarbons) at each site, with higher levels observed at the upgradient sites, which were situated farther from the nearby freshwater Imikpuk Lake. Additionally, soil biological data tests showed an active microbial community, including high bacterial numbers in these soils. Results from the baseline study indicate that stimulated bioremediation and phytoremediation processes present feasible options for cleanup of these soils. http://hdl.handle.net/11681/22906

USING GROUNDWATER AGE DISTRIBUTIONS TO UNDERSTAND CHANGES IN METHYL TERT-BUTYL ETHER (MTBE) CONCENTRATIONS IN AMBIENT GROUNDWATER, NORTHEASTERN UNITED STATES

Lindsey, B., J. Ayotte, B. Jurgens, and L. DeSimone.
Science of the Total Environment 579:579-587(2017)

MTBE use in the U.S. peaked in 1999 and was largely discontinued by 2007. Based on a national survey of wells selected to represent ambient conditions, temporal changes in MTBE concentrations in groundwater were evaluated in the northeastern United States, an area of the nation with widespread low-level detections of MTBE. Six well networks, each representing specific areas and well types (monitoring or supply wells), were each sampled at 10-yr intervals

between 1996 and 2012. Concentrations were decreasing or unchanged in most wells as of 2012, with the exception of a small number of wells where concentrations continue to increase. Statistically significant increasing concentrations were found in one network sampled for the second time shortly after peak MTBE use, and decreasing concentrations were found in two networks sampled for the second time about 10 yr after peak MTBE use. Modeling and sample results showed that wells with young median ages and narrow age distributions responded more quickly to changes in the contaminant source than wells with older median ages and broad age distributions. Well depth and aquifer type affect these responses. Regardless of the timing of decontamination, all of these aquifers show high susceptibility for contamination by a highly soluble, persistent constituent.

General News

CEST 2017: 15TH INTERNATIONAL CONFERENCE ON ENVIRONMENTAL SCIENCE AND TECHNOLOGY, 31 AUGUST - 2 SEPTEMBER 2017, RHODES, GREECE

Ministry of Environment and Energy (Greece) and the Municipality of Rhodes (Greece), 2017

The main organizer of this conference was the multi-disciplinary Global Network of Environmental Science and Technology (NEST), an international scientific movement with members from more than 60 countries that has focused on innovative environmental issues for 29 years. Among the wide range of topics included in the program are advanced oxidation processes, emerging pollutants, hazardous waste management, heavy metals in the environment, hydrology and water resources management, and soil and groundwater contamination and remediation. The book of abstracts (735 pages) can be downloaded or the individual papers reviewed at https://cest.gnest.org/cest2017/about.

ECOSYSTEM SERVICES AT CONTAMINATED SITE CLEANUPS

U.S. EPA Technical Support Project, Engineering Forum.
EPA 542-R-17-004, 15 pp, 2017

Ecosystem goods and services include clean air and water, fertile soil for crop production, pollination, and flood control. Information about ecosystem services can be considered when characterizing future land use options or designing a cleanup that is consistent with anticipated ecological reuse, depending on the regulatory authority of the cleanup program. An understanding of ecosystem concepts and tools can be useful in communicating the positive results of cleanup. https://semspub.epa.gov/src/document/11/100000459

SUPERFUND OPTIMIZATION PROGRESS REPORT 2011-2015

EPA 542-R-17-002, 75 pp, 2017

U.S. EPA continues to make progress on (1) implementing recommendations for individual optimization events, (2) conducting site-specific technical support, and (3) implementing the elements of the 2012 National Strategy to Expand Superfund Optimization Practices from Site Assessment to Site Completion. Status updates are provided for optimization recommendations for 41 new optimization events conducted during FY 2011 through FY 2015, for 20 optimization events with outstanding recommendations recorded in previous progress reports, and for 25 technical support projects conducted during FY 2011 through FY 2015. Highlights of project optimization and technical support events are included. https://semspub.epa.gov/src/document/11/196740

THE ELEVENTH WASHINGTON HYDROGEOLOGY SYMPOSIUM: PROGRAM AND ABSTRACTS

University of Washington, 116 pp, 2017

Over 250 professionals and students gathered for the 11th Hydrogeology Symposium held May 9-11, 2017, in Tacoma, Washington. Participants had the opportunity to attend sessions and hear speakers discuss recent developments in the field of hydrogeology, current research results, case studies, and best practices. Posters also highlighted current research and case studies. http://depts.washington.edu/uwconf/wordpress/wahgs/past-symposia/

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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