Technology Innovation News Survey

Entries for September 16-30, 2015

Market/Commercialization Information

FY 2017 SERDP SOLICITATIONS
Strategic Environmental Research and Development Program (SERDP), 2015

DoD's SERDP office is seeking environmental R&D proposals for competitive funding beginning in FY 2017. The Core Solicitation provides funding opportunities for basic and applied research and advanced technology development. The statement of need for Environmental Restoration lists three topics:

- ERSON-17-01: Improved strategies for remediating mixed contaminants (e.g., PCBs, metals, perchlorate, 1,4-dioxane, PFCs, NDMA, chlorinated and non-chlorinated VOCs, and munitions constituents) in groundwater.
- ERSON-17-02: Development of standardized sampling and analytical techniques for munitions constituents.
- ERSON-17-03: Improved understanding of the fate and effects of insensitive munitions constituents.

Core pre-proposals are due by 2:00 PM ET, January 7, 2016. See the details under Funding Opportunities at https://www.serdp-estcp.org/Funding-Opportunities/SERDP-Solicitations. See also information about the online seminar—SERDP Funding Opportunities: FY 2017—planned for November 10, 2015, from 1:30-2:30 PM ET. Preregistration is required.

SMALL BUSINESS EVENT: ENVIRONMENTAL PROTECTION AGENCY VENDOR OUTREACH SESSION FOR DISABLED VETERAN OWNED SMALL BUSINESS
U.S. Environmental Protection Agency, Office of Small Business Programs, Washington, DC.
Federal Business Opportunities, FBO-5082, 2015

EPA's Office of Small Business Programs will host a vendor outreach session for service-disabled, veteran-owned small businesses November 12, 2015, from 10 AM - 12 PM at EPA WJC East, 1201 Constitution Ave NW, Room 1153, in Washington, DC. Space is limited to one representative per firm. Register at https://www.surveymonkey.com/r/SDVOSB_111215. See the flyer attached to the FedBizOpps notice for details.
https://www.fbo.gov/notices/e41ef2abdde6729d0ac4f4bdd06f65c

REGIONAL ENVIRONMENTAL ACQUISITION TOOL, ENVIRONMENTAL REMEDIATION SERVICES, U.S. ARMY CORPS OF ENGINEERS, SOUTH ATLANTIC DIVISION
U.S. Army Corps of Engineers (USACE), USACE District, Jacksonville, FL.
Federal Business Opportunities, FBO-5082, Solicitation W912EP-15-R-0018, 2015

The USACE Jacksonville District intends to advertise on a set-aside basis for the award of an environmental remediation IDIQ, multiple-award task-order contract with a total capacity of $50M for up to four SBA-certified HUBZone firms (NAICS code 562910). The geographic areas to be served by these contracts will be the following states—Alabama, Tennessee, Florida, Georgia, Mississippi, North Carolina, and South Carolina—as well as Puerto Rico, U.S. Virgin Islands, Guam, and Central America. The solicitation will be issued in electronic format only, with release anticipated on or about November 5, 2015. https://www.fbo.gov/spg/USA/COE/DACA17/W912EP-15-R-0018/listing.html

FY16 ENVIRONMENTAL REMEDIATION SERVICES MULTIPLE AWARD CONTRACT, VARIOUS LOCATIONS, PRIMARILY ALASKA
U.S. Army Corps of Engineers (USACE), USACE District, Alaska, JBER, Alaska.
Federal Business Opportunities, FBO-5088, Solicitation W911KB-16-S-ERS, 2015

The USACE Alaska District is contemplating an unrestricted multiple-award IDIQ contract with capacity of about $240M to perform environmental remediation services in support of a wide range of customers serviced by the Alaska District, including the Alaska District's Formerly Used Defense Sites program, Army and Air Force environmental programs, and the environmental programs of other non-DoD customers. Firm-fixed-price or cost-reimbursement task orders may be issued; therefore, potential contractors must possess accounting systems adequate for award of cost-reimbursement work. The Alaska District awarded small business multiple-award IDIQ contracts in early FY14 for similar environmental remediation services. This new acquisition will complement that tool and is necessary due to an increase in mission. This notice constitutes a sources sought for qualified prime contractor firms only. Capability statements are due by 2:00 PM Alaska Time on November 18, 2015. https://www.fbo.gov/spg/USA/COE/DACA85/W911KB-16-S-ERS/listing.html

PEO ACWA, MANAGEMENT, PROGRAM, AND INTEGRATION SUPPORT
Department of the Army, Army Contracting Command - Rock Island, IL.
Federal Business Opportunities, FBO-5088, Solicitation W52P1J-16-R-ACWA, 2015

The Army Contracting Command - Rock Island, on behalf of the Program Executive Office, Assembled Chemical Weapons Alternatives (PEO ACWA), has identified an ongoing need for support to the mission to demilitarize the U.S. Government's chemical weapons stockpile. The objective of the projected contract is to provide support services to the PEO ACWA (located at the Aberdeen Proving Ground, Maryland) and to three PEO ACWA Field Offices: Blue Grass Chemical Agent-Destruction Pilot Plant, Richmond, Kentucky; Pueblo Chemical Agent-Destruction Pilot Plant, Pueblo, Colorado; and the Anniston Field Office, Anniston, Alabama. Qualified firms are invited to submit a capabilities response to this sources-sought notice by 1600 CT on November 30, 2015. https://www.fbo.gov/notices/865dd320789ce8d85629c031f97b9c66

RADIOACTIVE MATERIAL DISPOSAL SERVICES
U.S. Army Corps of Engineers (USACE), USACE District, Kansas City, MO.
Federal Business Opportunities, FBO-5087, Solicitation W912DQ-16-T-3000, 2015

The USACE Kansas City District intends to issue an RFQ for disposal services for radioactive materials and waste, including materials from sites where remedial actions are occurring (e.g., Superfund and Formerly Utilized Sites Remedial Action Program). The proposed solicitation will result in the award of a target of five blanket purchase agreements. This project is an unrestricted acquisition available to businesses of all sizes (NAICS code 562211). Release of the solicitation is anticipated on or about November 12, 2015https://www.fbo.gov/spg/USA/COE/DACA41/W912DQ-16-T-3000/listing.html

Cleanup News

IN SITU THERMAL TREATMENT COMPLETION REPORT, FRONTIER FERTILIZER SUPERFUND SITE
U.S. EPA Region 3, 277 pp, 2015

This report documents the operation and post-operation data from in situ thermal treatment (ISTT) activities at the Frontier Fertilizer Superfund Site in Davis, California. Five contaminants of concern (COCs)—1,2-dibromo-3-chloropropane, 1,2-dibromoethane, 1,2-dichloropropane (DCP), 1,2,3-trichloropropane (TCP), and carbon tetrachloride (CCl_4)—were identified in soil and groundwater at the former pesticide distribution facility. ISTT was applied from March 2011 to October 2012 to the source zone, which contained only the pesticide COCs (no CCl_4). The objective was to remove a continuing source of groundwater contamination by heating the soil using electrical resistance heating to temperatures of 90 ± 10°C in the unsaturated zone 95% reduction in contaminant mass. ISTT removed a total of 79.4 lbs of COCs, mainly DCP (52.5 lbs) and TCP (23.0 lbs), from the source zone.
http://yosemite.epa.gov/r9/sfund/r9sfdocw.nsf/3dc283e6c5d6056f88257426007417a2/fd82f49353eaa2338825 7eeb007515c5/$FILE/Final_FrontierFertilizer_ISTT_Report.pdf

COMPLEX BOUNDARY CONDITIONS FOR IN-SITU THERMAL TREATMENTS (ISTT) CONDUCTED DURING LAND RECYCLING AND REMEDIATION BENEATH BUILDINGS
Hiester, U. and M. Mueller. AquaConSoil 2015 & Proceedings of the 13th International UFZ-Deltares Conference on Sustainable Use and Management of Soil, Sediment and Water Resources, Copenhagen. 10 pp, 2015

This paper discusses challenges to in situ thermal treatment (ISTT) projects as illustrated in two case studies of remediation for PCE, TCE, and daughter products. In Case 1, ISTT implementation via thermal wells was concurrent with simultaneous foundation and superstructure work on a new factory building, and in Case 2, steam-enhanced extraction was conducted beneath a building during ongoing industrial production. The authors identify potential difficulties, offer suggestions for future projects, and describe the impact of complex boundary conditions on ISTT design, operation, and performance measurement.
http://www.reconsite.com/fileadmin/dateien/Publikationen/ISTT-SEE-TISS_Hiester_AquaConSoil2015.pdf
The authors previously contributed to a 2013 technical document on ISTT—*Guidelines: In Situ Thermal Treatment (ISTT) for Source Zone Remediation of Soil and Groundwater*—which is available at http://www.reconsite.com/fileadmin/dateien/Publikationen/ISTT_Guidelines_FINAL_PRINT.pdf

Demonstrations / Feasibility Studies

REVIEW CRITERIA FOR SUCCESSFUL TREATMENT OF HYDROLYSATE AT THE BLUE GRASS CHEMICAL AGENT DESTRUCTION PILOT PLANT
National Academies of Sciences, Engineering, and Medicine.
National Academies Press, Washington, DC. ISBN: 978-0-309-37640-2, 134 pp, 2015

The Blue Grass Chemical Agent Pilot Plant is scheduled to begin operation to destroy chemical munitions in 2018. BGCAPP is called a pilot plant because some of the processes used for destroying the agent have never before been used in this application, or used in combination with each other. Following munitions access and hydrolysis of nerve agents and energetics, the plant will use supercritical water oxidation (SCWO) to treat the hydrolysate, plus a system to recover water for reuse as quench water in the SCWO reactors. Except for scheduled maintenance, the systems are expected to operate continuously for over three years. This report discusses preoperational testing and plant systemization to identify process and equipment problems as well as potential systems issues when munitions destruction beginshttp://www.nap.edu/catalog/21771/review-criteria-for-successful-treatment-of-hydrolysate-at-the-blue-grass-chemical-agent-destruction-pilot-plant

THERMAL DESORPTION PILOT TESTING: BIOCHIM MACHELEN
Foucart, F., INTERSOL 2015: International Conference-Exhibition on Soils, Sediments and Water, 13 slides, 2015

In 2013, two pilot tests were carried out on the site of the Biochim solvent recycling plant, which burned down in 1993. The main components in soil vapor are toluene (16.09%), xylenes (10.31%), DCE (5.8%), n-hexane (5.35%), and n-heptane (2.96%). LNAPL consists mainly of aromatic and aliphatic hydrocarbons, diethylhexyl phthalate, indane, diisodecyl phthalates, biphenyl, and bifenyloxide. The presence of PFOS is being investigated as well. The first pilot consisted of soil heating by thermal conductivity, combined with soil vapor extraction. Temperatures around heating tubes inserted into the soil reached 300°C, providing an average temperature of 80°C across the entire pilot zone. The extracted contaminants were treated aboveground in a catalytic heater with gas scrubbing. This pilot, completed in November 2013, demonstrated that soil heating significantly boosts the rate of contaminant extraction. In the second pilot test, multiphase extraction was employed to remove both contaminated soil vapor and groundwater. In the initial phase, soil vapor was extracted without soil heating, until stagnating or decreasing concentrations were reached; however, soil vapor concentrations declined considerably within three months after a more powerful multiphase extraction pump was installed. In the second phase, the subsoil was warmed with radio-frequency heating. The electrical heating process progressed more slowly than thermal conductivity heating and thus was not considered further for large-scale application. http://www.intersol.fr/download/26032015/download.php?f=Francois_Foucart_Envisan_Intersol_2015.pdf

Research

DEGRADATION OF BUNKER C FUEL OIL BY WHITE-ROT FUNGI IN SAWDUST CULTURES SUGGESTS POTENTIAL APPLICATIONS IN BIOREMEDIATION
Young, D., J. Rice, R. Martin, E. Lindquist, A. Lipzen, I. Grigoriev, and D. Hibbett.
PLoS ONE, Vol 10 No 6, 2015

This study investigated degradation of Number 6 Bunker C fuel oil compounds by six types of white-rot fungi. Averaging across all studied species, 98.1% C10 alkane, 48.6% C14 alkane, and 76.4% phenanthrene in the initial Bunker C were degraded after 180 days of fungal growth on pine media. The mechanisms by which the fungi degrade complex oil compounds remain obscure, but degradation results of the 180-day cultures suggest that diverse white-rot fungi have promise for bioremediation of petroleum fuels. http://journals.plos.org/plosone/article?id=10.1371/journal.pone.0130381

LEACHING AND MECHANICAL BEHAVIOUR OF SOLIDIFIED/STABILIZED NICKEL CONTAMINATED SOIL WITH CEMENT AND GEOSTA
Hytiris, N., P. Fotis, T.-D. Stavraka, A. Bennabi, and R. Hamzaoui.
International Journal of Environmental Pollution and Remediation, Vol 3, 1-8, 2015

Solidification/stabilization (SS) of nickel-contaminated soil was carried out using Ordinary Portland Cement (OPC) and a commercial stabilizer to investigate the effects of different binder combinations of OPC and commercial stabilizer wt% in the SS mix designs and physical and chemical characteristics of the treated samples. The mechanical property studied was unconfined compressive strength, while chemical characterization of the samples focused on nickel leachability. The optimum mix design in terms of mechanical efficiency was 10% OPC wt% and 4.2 wt% commercial stabilizer, whereas in terms of chemical efficiency the optimum mix was 10% OPC wt% and 1.4 wt% commercial stabilizer.
http://ijepc.avestia.com/2015/001.html

DEMONSTRATING LEACHING REDUCTIONS OF NAPL-IMPACTED SOILS TREATED WITH STABILIZATION/SOLIDIFICATION USING MODIFIED EPA METHOD 1315
Finney, D., T. Himmer, J. Morris, and S. Coladonato.
Journal of Hazardous, Toxic and Radioactive Waste, Vol 19 No 1, C4014002, 2015

A phased stabilization/solidification (SS) treatability study was performed on NAPL-contaminated soils at the Quanta Resources Superfund site, where naphthalene was the key constituent of concern (COC) from a mass perspective. Conventional synthetic precipitation leaching procedure (SPLP) testing was used to characterize the baseline leaching of the untreated soil. SPLP and two semi-dynamic leaching (SDL) methods (ANS/ANSI 16.1 and EPA Method 1315 modified for organics) were used to assess leaching reduction of the SS treatments to demonstrate a 90% reduction in total COC leaching. As expected, SPLP testing of treated samples produced virtually no change in leaching behavior, whereas a 5-day ANS/ANSI 16.1 test was effective in a screening mode to identify successful mix designs for long-term (67-day) testing via EPA Method 1315M. Total pozzolan doses of 8% by weight or greater satisfied the UCS and hydraulic conductivity criteria, and leaching reductions of 90% or more were realized for the majority of the COC per EPA Method 1315M.

TREATABILITY TESTING, EVALUATION AND IMPLEMENTATION OF IN-SITU STABILIZATION/SOLIDIFICATION AT A FORMER MGP SITE
Singh, R., D. Guirguess, J. Mikochik, J. Bracken, and M. McGowan.
MGP 2014: Manufactured Gas Plant Conference, Poster, 2014

Investigations conducted at a former MGP site in New Jersey identified free and residual NAPL in the soil and groundwater, including elevated levels of BTEX, PAHs, and lead. To prepare for in situ stabilization/solidification at the site, bench-scale treatability testing was conducted to identify and optimize reagent dosages for a combination of Portland cement, blast furnace slag, organoclay, and EnviroBlend®. Comparison testing of the mix/formulation using EPA SW-846 Method 1315 (Leaching Environmental Assessment Framework, or LEAF) versus SW-846 Method 1312 (Synthetic Precipitation Leaching Procedure, or SPLP) revealed that although flux determination as measured by flux-based Method 1315 requires a considerably longer testing time than is practically feasible in the field, bench-scale treatability testing can be performed to develop the required leachability correlations.
http://www.mgpconference.com/wp/wp-content/uploads/2014/02/73_SINGH.pdf

IMMOBILISATION OF METALS IN CONTAMINATED LANDFILL MATERIAL USING ORTHOPHOSPHATE AND SILICA AMENDMENTS: A PILOT STUDY
Camenzuli, D., D.B. Gore, and S.C. Stark.
International Journal of Environmental Pollution and Remediation, Vol 3, 27-32, 2015

This paper presents bench-scale results on the use of silica and coupled orthophosphate-silica treatments to immobilize metal contaminants in soil material obtained from the Thala Valley landfill, East Antarctica, which contains metal-contaminated sediment mixed with petroleum hydrocarbons. Treatment performance was assessed by the concentrations of Cu, Zn, As, and Pb released using the toxicity characteristic leaching procedure. Orthophosphate-silica addition,

the more effective treatment, reduced leachable Cu, Zn, and Pb by 95, 96, and 99%, respectively, relative to controls. http://ijepr.avestia.com/2015/004.html

PERFORMANCE EVALUATION OF SOLIDIFICATION/STABILIZATION OF DREDGED SEDIMENT USING ALKALI-ACTIVATED SLAG
Choa, H.-N., J.-H. Shima, and J.-Y. Park.
Desalination and Water Treatment, [Online prior to print publication] 2015

Fine dredged sediment was immobilized using ground granulated blast furnace slag as a new binder for supplementary cementitious materials in a 3.5% NaOH solution to study its solidification/stabilization (SS), specifically to compare the effect of mixing conditions of the saturated surface-dry of dredged sediment to determine the proper mixing method in the SS process. Based upon measurements of mechanical strength, heavy metal leachability, and microstructural characterization of the dredged sediment treated with alkali-activated slag (AAS) paste, the maximum value of the mechanical strength was obtained when the same amount of the NaOH solution as the saturated surface-dry of the dredged sediment was added. Leaching results showed that heavy metals were immobilized in the AAS paste: Cr, Cd, and Pb were not detected. This study indicates the potential of using fine dredged sediment successfully as a base aggregate or a sub-base material for concrete production.

DEVELOPING CONCEPTUAL MODELS FOR ASSESSING CLIMATE CHANGE IMPACTS TO CONTAMINANT AVAILABILITY IN TERRESTRIAL ECOSYSTEMS
Suedel, B.C., N.R. Beane, E.R. Britzke, C.R. Montgomery, and S.M. Brasfield.
ERDC/EL TN-15-1, 12 pp, 2015

A series of new conceptual models (CMs) illustrate how various aspects of climate change can affect contaminant availability and threatened, endangered, and at-risk species of terrestrial habitats. The CMs can be used as a framework to delineate climate change impacts, thus providing a tool to aid military installations in managing climate change impacts. This paper also summarizes the conclusions from a series of workshops held to gather expert input to inform the development of the CMs. http://el.erdc.usace.army.mil/elpubs/pdf/tnel15-1.pdf

REGENERATION STRATEGIES OF POLYMERS EMPLOYED IN EX-SITU REMEDIATION OF CONTAMINATED SOIL: BIOREGENERATION VERSUS SOLVENT EXTRACTION
Mosca Angelucci, D. and M.C. Tomei.
Journal of Environmental Management, Vol 159, 169-177, 2015

A novel ex situ soil decontamination process is based on contaminant sorption on polymer beads, which can be regenerated in a subsequent step. The feasibility of two regeneration strategies was examined in a two-step process in soil contaminated with a mixture of 4-chlorophenol and pentachlorophenol (PCP). A commercial polymer, Hytrel, was selected for extraction. Solvent extraction and biological regeneration (realized in a 2-phase partitioning bioreactor), were tested and compared for polymer regeneration. Removal efficiencies of the polymer-soil extraction were in the range of 51-97% for a contact time ≤ 24 h. Results demonstrated the feasibility of both regeneration strategies, but bioregeneration was advantageous in that it provided for biodegradation of the contaminants desorbed from the polymer, achieving practically complete 4-chlorophenol removal and up to 85% PCP biodegradation efficiency. The solvent extraction option produced highly contaminated effluent requiring disposal or additional treatment. Bioregeneration operating costs were more than an order of magnitude lower than those of solvent extraction. http://www.irsa.cnr.it/Docs/Archivio/JEM_2015.pdf

SOIL REMEDIATION USING SOLVENT EXTRACTION WITH HYDRODEHALOGENATION AND HYDROGENATION IN A SEMICONTINUOUS SYSTEM
Panczer, Robert John, Master's thesis, University of South Florida, 55 pp, 2014

In research conducted to aid in the development of REACH (remedial extraction and catalytic hydrodehalogenation), a green remediation technology for removing and destroying halogenated hydrophobic organics in soil, a bench-top semicontinuous model was constructed and used to extract 1,2,4,5-tetrachlorobenzene (TeCB) from soil. The goal was final conversion to an acceptable end product, cyclohexane. Palladium was used as a catalyst for hydrodehalogenation, which converted the TeCB to benzene. Rhodium was used to catalyze the hydrogenation of benzene to cyclohexane. Although the REACH process extracted TeCB successfully from the soil, only partial conversion from TeCB to cyclohexane occurred, likely owing to catalyst deactivation. Ultraviolet solvent treatment was tested as a means of mitigating catalyst deactivation without significant effect. Results show that development of a technique to mitigate the severity of catalyst deactivation is required for the REACH technology to realize its potential as a viable technology for cleaning soil contaminated with halogenated organics. http://scholarcommons.usf.edu/etd/5092/

EDIBLE OIL AND MICROCED™ TREATABILITY STUDY FOR ENHANCED ATTENUATION OF CVOCS AT P AREA, SAVANNAH RIVER SITE
Amidon, M.B. and B.D. Riha.
Waste Management 2015, March 15-19, 2015, Phoenix, AZ. Paper 15364, 16 pp, 2015

Researchers are evaluating the capability of Micro-organism Chlorinated Ethene Destruction (MicroCED™) to degrade chlorinated VOCs (CVOCs) in an existing groundwater plume. Although MicroCED is similar to commercially sold *Dehalococcoides* cultures (i.e., BAV-1 and KB-1) used to degrade CVOCs, this microbe is indigenous to the Twin Lakes near C Area at DOE's Savannah River facility. Two separate injection campaigns of MicroCED were conducted in 2011, but the quantity available for injection was insufficient to the need owing to a limitation in capacity to support microbial growth in step with the project schedule. An approach was implemented subsequently to evaluate the potential to grow MicroCED in the field, but success was not measurable. Analysis of the field data showed that changes were occurring at the site, with different responses observed in the injection wells and monitoring points, i.e., minor increases in TOC and decreases in DO and ORP, with the groundwater overall remaining oxygenated except near the injection wells. http://www.osti.gov/scitech/biblio/1172479

ZEROVALENT IRON MICRO AND NANOPARTICLES FOR GROUNDWATER REMEDIATION: FROM LABORATORY TO FIELD SCALE
Tosco, T., F. Gastone, M. Luna, and R. Sethi.
International Conference on Water and Development, 14 January 2015, Milan, Italy. Fondazione Enrico Mattei, Poster, 2015

This poster presents an overview of lab tests, field applications, and modeling approaches for the development of an innovative groundwater remediation technique based on the injection of zero-valent iron micro- and nanoparticles dispersed in shear thinning fluids. http://porto.polito.it/2590168/1/ToscoSethi_ZVI_ConvegnoFondazioneEnricoMattei_ter.pdf

A LONG-TERM FIELD STUDY OF IN SITU BIOREMEDIATION IN A FRACTURED CONGLOMERATE TRICHLOROETHENE SOURCE ZONE
Verce, M.F., V.M. Madrid, S.D. Gregory, Z. Demir, M.J. Singleton, E.P. Salazar, P.J. Jackson, R.U. Halden, and A. Verce.
Bioremediation Journal Vol 19 No 1, 18-31, 2015

An 8-year bioremediation field study was conducted in a TCE-contaminated, highly indurated (i.e., hard), recharge-limited conglomerate where common remediation strategies, such as groundwater recirculation and direct push installation of a large well network, could not be used. A tracer test indicated that remediation fluids flowed mainly through fractures and sand lenses in the conglomerate. This was confirmed during in situ bioremediation of the site, in which volatile fatty acids and *Dehalococcoides* (from injection of lactate and a bioaugmentation culture, respectively) were the most accurate indicators of transport between wells. The injection of tracer water also mobilized contaminants. Despite these difficulties, dissolved contaminant mass decreased by an estimated 80% by the end of the test, reaching the lowest values ever recorded at the site. The persistence of ethene four years after bioaugmentation suggests that the dechlorinating capacity of the remaining microbial community is comparable to the matrix diffusion of TCE into the dissolved phase. *Manuscript version*: https://e-reports-ext.llnl.gov/pdf/766115.pdf

DELINEATING GROUNDWATER-SURFACE WATER INTERACTION
Schneidewind, U., C. Anibas, I. Joris, and P. Seuntjens.
Contaminated Land: Applications in Real Environments (CL:AIRE), London. ADVOCATE Bulletin AB9, 9 pp, 2015

The hyporheic zone (HZ)—the transition zone between an aquifer and a surface water body—is also called the groundwater-surface water interface. The HZ provides ecological services, such as habitat for interstitial organisms, spawning grounds for fish, and a rooting zone for aquatic plants. This bulletin briefly outlines the current scientific understanding of water flow across the HZ and discusses important methods to quantify them, with a particular focus on using heat as an environmental tracer.
http://www.claire.co.uk/index.php?option=com_phocadownload&view=category&download=474:advocate-bulletin-9-delineating-groundwater-surface-water-interaction-written-by-uwe-schneidewind&id=25:advocate-bulletins

DUAL C-CL ISOTOPE ANALYSIS TO DISTINGUISH PROCESSES AFFECTING CHLORINATED ETHENES AT FIELD SCALE
Badin, A.
Contaminated Land: Applications in Real Environments (CL:AIRE), London. ADVOCATE Bulletin AB10, 9 pp, 2015

In a study of the application of dual carbon-chlorine (C-Cl) isotope analysis to PCE during its dechlorination by two distinct bacterial consortia and in two field sites undergoing PCE dechlorination, investigators concluded that PCE bacterial dechlorination could be carried out according to two different processes. Although C-Cl isotope analysis could distinguish biotic degradation processes from abiotic ones, when several reaction mechanisms occur during PCE reductive dechlorination, two C-Cl isotope trends could reflect the difference between both biotic and abiotic processes and also between biotic processes themselves. This finding highlights the complexity of interpreting dual C-Cl isotope data and indicates the need to use the technique with care to distinguish degradation processes in the field. http://www.claire.co.uk/index.php?option=com_phocadownload&view=category&download=475:ab10-alice-pdf&id=25:advocate-bulletins

General News

CHARACTERIZATION, MODELING, MONITORING, AND REMEDIATION OF FRACTURED ROCK
National Research Council.
National Academies Press, Washington, DC. ISBN: 978-0-309-37898-7, 244 pp, 2015

This report examines the state of practice and state of art in the characterization of fractured rock and the chemical and biological processes related to subsurface contaminant fate and transport. Fundamental understanding of the physical nature of fractured rock has changed little since the publication of the 1996 National Research Council report, *Rock Fractures and Fluid Flow: Contemporary Understanding and Fluid Flow*, but many new characterization tools have been developed along with a greater appreciation for the importance of chemical and biological processes that can occur in the fractured rock environment. The findings of this report are particularly applicable to engineered repositories for buried or stored waste and to fractured rock sites that have been contaminated as a result of past disposal or other practices. Recommendations are provided to help the practitioner, researcher, and decision-maker take a more interdisciplinary approach to engineering in the fractured rock environment. The report can be downloaded as a free PDF file at http://www.nap.edu/catalog/21747/characterization-modeling-monitoring-and-remediation-of-fractured-rock.

HAZARDOUS WASTE CLEANUP: NUMBERS OF CONTAMINATED FEDERAL SITES, ESTIMATED COSTS, AND EPA'S OVERSIGHT ROLE
U.S. Government Accountability Office.
GAO-15-830T, 28 pp, 11 Sep 2015

This testimony focuses on (1) the numbers of contaminated and potentially contaminated federal sites for four departments (Agriculture, Defense, Energy, and Interior); (2) spending and estimates of future costs for cleanup at these sites; and (3) EPA's role in maintaining the list of contaminated and potentially contaminated federal sites and ensuring that preliminary assessments of the sites are complete. http://www.gao.gov/products/GAO-15-830T

STABILIZATION AND SOLIDIFICATION OF CONTAMINATED SOIL AND WASTE: A MANUAL OF PRACTICE
Bates, E. and C. Hills.
Hygge Media, 603 pp, 2015

This manual has been designed as a practical reference for regulators, site owners, engineering firms, and others involved in selecting, designing, bidding, and providing oversight for the remediation of hazardous waste sites using stabilization/solidification (SS) technology. The guide covers applicable contaminants, site characteristics, project planning, equipment capabilities, production rates, performance specifications, and quality assurance of SS-treated materials. The text offers examples from numerous case studies and an extensive reference list of completed projects where SS was successfully implemented. https://clu-in.org/download/techfocus/stabilization/S-S-Manual-of-Practice.pdf

DATA COLLECTION HANDBOOK TO SUPPORT MODELING IMPACTS OF RADIOACTIVE MATERIAL IN SOIL AND BUILDING STRUCTURES
Yu, C., S. Kamboj, C. Wang, and J.-J. Cheng.
ANL/EVS/TM-14/4, 294 pp, 2015

This handbook updates the 1993 version of the *Data Collection Handbook and the Radionuclide Transfer Factors Report* to support modeling the impact of radioactive material in soil. Many new parameters have been added to the RESRAD family of codes, and new measurement methodologies are available. This handbook is a companion document to the user manuals for RESRAD (onsite) and RESRAD-OFFSITE. It also can be used for RESRAD-BUILD because some building-related parameters are included in this handbook. RESRAD (onsite) has been developed for implementing DOE residual radioactive material guidelines. Hydrogeological, meteorological, geochemical, geometrical (size, area, depth), crops and livestock, human intake, source characteristic, and building characteristic parameters are used in RESRAD (onsite). RESRAD-OFFSITE is an extension of the RESRAD (onsite) code and can also model the transport of radionuclides to locations outside the primary contamination footprint. This handbook discusses parameter definitions, typical ranges, variations, and measurement methodologies. It also provides references for sources of additional information. Although this document was developed primarily to support the application of RESRAD codes, the discussions and values are valid for use with other pathway analysis models and codes. http://web.ead.anl.gov/resrad/documents/data_collection.pdf

MANAGEMENT AND REMEDIATION OF SITES IN THE PETROLEUM INDUSTRY: AN IPIECA GOOD PRACTICE GUIDE
IPIECA: The Global Oil and Gas Industry Association for Environmental and Social Issues, 68 pp, 2014

This publication was written to support decision-making associated with the management of impacts to soil, groundwater, and soil vapor, including the presence of NAPL. The text covers potential exposures and risks, investigation techniques, and available technologies from which a site-specific assessment or corrective action plan can be developed. The guide describes the process used to develop a conceptual site model (CSM) to address potential sources, exposure pathways, and receptors; data collection to support the CSM and identify imminent hazards; a process to identify potential risks and assess risk-based corrective action measures; steps for implementing risk reduction measures and remedial actions; and activities to close out the project. http://www.ipieca.org/publication/management-and-remediation-sites-petroleum-industry-ipieca-good-practice-guide *Other publications relevant to monitoring and cleanup of oil production sites and oil spills are available in the IPIECA library at* http://www.ipieca.org/library.

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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