



TechDirect, March 1, 2016

Welcome to TechDirect! Since the February 1 message, TechDirect gained 209 new subscribers for a total of 35,728. If you feel the service is valuable, please share TechDirect with your colleagues. Anyone interested in subscribing may do so on CLU-IN at <https://clu-in.org/techdirect>. All previous issues of TechDirect are archived there. The TechDirect messages of the past can be searched by keyword or can be viewed as individual issues.



TechDirect's purpose is to identify new technical, policy and guidance resources related to the assessment and remediation of contaminated soil, sediments and groundwater.

Mention of non-EPA documents or presentations does not constitute a U.S. EPA endorsement of their contents, only an acknowledgment that they exist and may be relevant to the TechDirect audience.

> Funding Opportunity

FY 2017 ESTCP Solicitations Released. The Department of Defense's (DoD) Environmental Security Technology Certification Program (ESTCP) requests demonstration proposals for Environmental and Installation Energy and Water technologies. The DoD Calls for Proposals request pre-proposals related to: Environmental Restoration; Munitions Response in Underwater Environments; Resource Conservation; Weapons Systems and Platforms; Energy Efficiency for Military Buildings; and Improved Water Use for Military Industrial Operations. The Broad Agency Announcements (BAA) and Calls for Proposals for Federal Organizations Outside DoD request pre-proposals related to: In Situ Management of Contaminated Aquatic Sediments; Reduce Source Loading of Munitions Constituents; Detection, Classification, and Remediation of Military Munitions in Underwater Environments; Fugitive Dust Technologies, Methodologies, and Tools for Department of Defense Installations; Ecosystem Process Model Intercomparison; Energy Efficiency for Military Buildings; and Improved Water Use for Military Industrial Operations. All pre-proposals are due April 5, 2016. Submission details and the presentation from the February 19 webinar are available at <https://serdp-estcp.org/Funding-Opportunities/ESTCP-Solicitations>.

> Upcoming Live Internet Seminars

ITRC Integrated DNAPL Site Characterization - March 8, 2016, 1:00PM-3:15PM EST (18:00-20:15 GMT). The Integrated DNAPL Site Characterization Team has synthesized the knowledge about dense nonaqueous phase liquid (DNAPL) site characterization and remediation acquired over the past several decades, and has integrated that information into a new document, Integrated DNAPL Site Characterization and Tools Selection (ISC-1, 2015). This guidance is a resource to inform regulators, responsible parties, other problem holders, consultants, community stakeholders, and other interested parties of the critical concepts related

to characterization approaches and tools for collecting subsurface data at DNAPL sites. After this associated training, participants will be able to use the guidance to develop and support an integrated approach to DNAPL site characterization, including: identify what site conditions must be considered when developing an informative DNAPL conceptual site model (CSM); define an objectives-based DNAPL characterization strategy; understand what tools and resources are available to improve the identification, collection, and evaluation of appropriate site characterization data; and navigate the DNAPL characterization tools table and select appropriate technologies to fill site-specific data gaps. For more information and to register, see <http://www.itrcweb.org> or <http://clu-in.org/live>.

ITRC Use and Measurement of Mass Flux and Mass Discharge - March 10, 2016, 1:00PM-3:30PM EST (18:00-20:30 GMT). The ITRC technology overview, Use and Measurement of Mass Flux and Mass Discharge (MASSFLUX-1, 2010), and associated Internet-based training provide a description of the underlying concepts, potential applications, description of methods for measuring and calculating, and case studies of the uses of mass flux and mass discharge. This Technology Overview, and associated Internet-based training are intended to foster the appropriate understanding and application of mass flux and mass discharge estimates, and provide examples of use and analysis. The document and training assumes the participant has a general understanding of hydrogeology, the movement of chemicals in porous media, remediation technologies, and the overall remedial process. For more information and to register, see <http://www.itrcweb.org> or <http://clu-in.org/live>.

Ecological Revitalization and Contaminated Sites - March 17, 2016, 2:00PM-3:30PM EDT (18:00-19:30 GMT). Restoring local ecosystems as part of the cleanup and reuse of contaminated properties can enhance remedies, strengthen community interest and provide significant environmental benefits. These native landscapes improve soil health and support diverse vegetation, protect air and water quality, support wildlife habitat and recreation areas, and enable environmental education opportunities. This webinar focuses on ecological revitalization and provides an in-depth look at the TVA Kingston Fossil Plant Fly Ash site in Kingston, Tennessee. Restoration efforts there went beyond cleanup requirements, with native species supporting diverse natural habitats. For more information and to register, see <http://clu-in.org/live>.

Superfund Research Program Small Business Water Innovation Progress in Research: Session I - Sustainable Approaches to Remediation - March 21, 2016, 1:00PM-3:00PM EDT (17:00-19:00 GMT). The National Institute of Environmental Health Sciences (NIEHS) Superfund Research Program (SRP) is hosting a series of webinars to highlight SRP-funded projects around the country that support innovation in water technologies and research. The Superfund Research Program Small Business Water Innovation Progress in Research series will feature SRP Small Business Innovation Research / Small Business Technology Transfer Research (SBIR/STTR) grantees (<http://tools.niehs.nih.gov/srp/programs/index269.cfm>) working on new technologies for detection and remediation of hazardous substances in water, including arsenic, dioxane, and trichloroethylene and other chlorinated solvents. The webinars are free and open to the public. Each webinar will begin with a brief update of the technology followed by an open question and answer session. This format is meant to facilitate a dialogue between the small business innovators and stakeholders during the early in the stages of research progress - to ensure successful technology transfer and application by end users. This session, "Sustainable Approaches to Remediation," will feature presentations from Lynntech Inc., Airlift Environmental LLC, MicroChemica LLC, and Microvi Biotechnologies. For more information and to register, see <http://clu-in.org/live>.

Superfund Research Program Small Business Water Innovation Progress in Research: Session II - Innovative Detection Technologies - March 23, 2016, 1:00PM-3:00PM EDT (17:00-19:00 GMT). The National Institute of Environmental Health Sciences (NIEHS) Superfund Research Program (SRP) is hosting a series of webinars to highlight SRP-funded projects around the country that support innovation in water technologies and research. The Superfund Research Program Small Business Water Innovation Progress in Research series

will feature SRP Small Business Innovation Research / Small Business Technology Transfer Research (SBIR/STTR) grantees (<http://tools.niehs.nih.gov/srp/programs/index269.cfm>) working on new technologies for detection and remediation of hazardous substances in water, including arsenic, dioxane, and trichloroethylene and other chlorinated solvents. The webinars are free and open to the public. Each webinar will begin with a brief update of the technology followed by an open question and answer session. This format is meant to facilitate a dialogue between the small business innovators and stakeholders during the early in the stages of research progress - to ensure successful technology transfer and application by end users. This session, "Innovative Detection Technologies," will feature presentations from OndaVia Inc., Lynntech Inc., and Agiltron Inc. For more information and to register, see <http://clu-in.org/live>.

ITRC Mining Waste Treatment Technology Selection - March 24, 2016, 1:00PM-3:15PM EDT (17:00-19:15 GMT). ITRC's Mining Waste Team developed the ITRC Web-based Mining Waste Technology Selection site to assist project managers in selecting an applicable technology, or suite of technologies, which can be used to remediate mine waste contaminated sites. Decision trees, through a series of questions, guide users to a set of treatment technologies that may be applicable to that particular site situation. Each technology is described, along with a summary of the applicability, advantages, limitations, performance, stakeholder and regulatory considerations, and lessons learned. Each technology overview links to case studies where the technology has been implemented. In this associated Internet-based training, instructors provide background information then take participants through the decision tree using example sites. Project managers, regulators, site owners, and community stakeholders should attend this training class to learn how to use the ITRC Web-based Mining Waste Technology Selection site to identify appropriate technologies, address all impacted media, access case studies, and understand potential regulatory constraints. For more information and to register, see <http://www.itrcweb.org> or <http://clu-in.org/live>.

Identifying the Potential for Methylation of Mercury at Mining Sites - March 29, 2016, 1:00PM-3:00PM EDT (17:00-19:00 GMT). This webinar presents two case studies that highlight the impacts of treatments and management strategies on mercury methylation and methylmercury release at mining sites. Methyl mercury (MeHg) is a toxic and bioavailable form of mercury. The first case study will document results of a mining-influenced waters treatability study conducted at the Formosa Mine Superfund site. One component of this investigation assessed the influence of sulfate-reducing bacteria on the production and release of MeHg during the treatment of mining-influenced water. The results are being used to inform the design, application, and assessment of sulfate-reducing biochemical reactors. The second looks at the impact of water level fluctuation on sediment in the Cottage Grove Reservoir, located downstream from the former Black Butte mercury mine of the Black Butte Superfund site. Results suggest that exposure of sediments to air while water levels are lowered may replenish the supply of sulfate (and/or other electron acceptors) needed to stimulate microbial production of MeHg mercury when the reservoir level is raised. For more information and to register, see <http://clu-in.org/live>.

Using Fish Tissue Data to Monitor Remedy Effectiveness - March 30, 2016, 1:00PM-3:00PM EDT (17:00-19:00 GMT). This webinar will introduce the critical factors for planning and executing an effective fish tissue monitoring program under CERCLA. Topics to be discussed include choosing species, collection methods, timing of sampling events, number of samples to collect, individual vs composite samples, baseline sampling, and more. Case studies on fish monitoring at the Hudson River and Fox River Superfund sites and lessons learned will also be presented. For more information and to register, see <http://clu-in.org/live>.

ITRC Biochemical Reactors for Treating Mining Influenced Water - March 31, 2016, 1:00PM-3:15PM EDT (17:00-19:15 GMT). Mining influenced water (MIW) includes aqueous wastes generated by ore extraction and processing, as well as mine drainage and tailings runoff. MIW handling, storage, and disposal is a major environmental problem in mining districts throughout the U.S. and around the world. Biochemical reactors (BCRs) are engineered treatment systems that use an organic substrate to drive microbial and chemical reactions to

reduce concentrations of metals, acidity, and sulfate in MIWs. The ITRC Biochemical Reactors for Mining-Influenced Water technology guidance (BCR-1, 2013) and this associated Internet-based training provide an in-depth examination of BCRs; a decision framework to assess the applicability of BCRs; details on testing, designing, constructing and monitoring BCRs; and real world BCR case studies with diverse site conditions and chemical mixtures. At the end of this training, you should be able to complete the following activities: describe a BCR and how it works; identify when a BCR is applicable to a site; use the ITRC guidance for decision-making by applying the decision framework; improve site decision-making through understanding of BCR advantages, limitations, reasonable expectations, regulatory and other challenges; and navigate the ITRC Biochemical Reactors for Mining-Influenced Water technology guidance (BCR-1, 2013). For more information and to register, see <http://www.itrcweb.org> or <http://clu-in.org/live>.

SERDP and ESTCP Webinar Series Continues throughout 2016. Join SERDP and ESTCP for free webinars every month to promote the transfer of innovative, cost-effective, and sustainable solutions for DoDs environmental challenges. The series targets end users, including practitioners, the regulatory community, and researchers with the objective of providing cutting-edge and practical information from sponsored research and technology demonstrations in an easily accessible format. To view the complete schedule of upcoming webinars and to download archived presentations, please visit <https://www.serdp-estcp.org/Tools-and-Training/Webinar-Series>.

> New Documents and Web Resources

Land Revitalization Program Tools for Communities (EPA 560-F-16-001). EPA's Land Revitalization Team works across EPA Regions and program offices, and in partnership with other federal agencies and the private sector to support communities in their efforts to implement sustainable redevelopment strategies. This fact sheet highlights some of the tools that have resulted from the regional community-based projects undertaken with assistance from the Land Revitalization Program. These useful tools can be adapted for use in other communities (January 2016, 6 pages). View or download at <http://www.epa.gov/land-revitalization/land-revitalization-program-tools-communities-factsheet>.

Superfund Radiation Risk Assessment Calculator Training. EPA and the Oak Ridge National Laboratory (ORNL) collaboratively developed this training. This training is a full-day advanced course that focuses on specific technical and regulatory issues that site managers and technical staff address when managing sites under the U.S. EPA's Superfund remediation program that have a risk assessment conducted for radioactive contaminants. These tools can facilitate better decision making for accelerated cleanups. The instructional methodology for this course includes lectures and demonstrations of using EPA risk and dose assessment calculators developed by the Superfund remedial program. The target audience for this course is site managers, risk assessors and others that want to obtain a working knowledge on conducting Superfund radiation risk assessments (February 2016, 382 pages). The background material for the full one day classroom course is available at <http://semspub.epa.gov/src/document/HQ/10000026>.

ESTCP Tool for the Selection of Bioremediation Approaches at Chlorinated Solvent Sites. ESTCP has developed an easy-to-use tool called BioPIC to facilitate bioremediation decision-making based on site-specific physical and biogeochemical characteristics. This research project determined the relationship between biogeochemical parameters and degradation rates for known degradation pathways of chlorinated ethenes (primarily PCE, TCE, and daughter products). Data from 90+ sites was used to establish correlations between the naturally attained rate constant and the abundance of specific parameters. Associations were then established for parameters such as *Dehalococcoides* (Dhc) densities, reductase densities, dissolved oxygen, oxidation-reduction potential, magnetic susceptibility, Fe(II), Mn(II), methane,

ethane, total organic carbon, and others. These associations were used to develop a quantitative framework and decision logic for the screening tool. Based on site-specific conditions, the tool will provide screening considerations to determine if monitored natural attenuation (MNA), biostimulation, biologically mediated abiotic reductive dechlorination, or bioaugmentation is the most appropriate remedial approach. See the BioPIC tool and additional information at

<https://www.serdp-estcp.org/Program-Areas/Environmental-Restoration/Contaminated-Groundwater/Persistent-Contamination/ER-201129>.

Superfund Research Program (SRP) Research Briefs. To get monthly updates on research advances from the SRP you can subscribe to their Research Brief mailing list at

<https://list.nih.gov/cgi-bin/wa.exe?SUBED1=SRP-BRIEF&A=1>.

Technology Innovation News Survey Corner. The Technology Innovation News Survey contains market/commercialization information; reports on demonstrations, feasibility studies and research; and other news relevant to the hazardous waste community interested in technology development. Recent issues, complete archives, and subscription information is available at <https://clu-in.org/products/tins/>. The following resources were included in recent issues:

- Natural Source Zone Depletion (NSZD) Pilot Test Memos
- Screening of the Bacterial Reductive Dechlorination Potential of Chlorinated Ethenes in Contaminated Aquifers
- In Situ Wetland Restoration Demonstration: ESTCP Cost and Performance Report
- Methods for Minimization and Management of Variability in Long-Term Groundwater Monitoring Results
- Assessing Mercury and Methylmercury Bioavailability in Sediment Pore Water Using Mercury-Specific Hydrogels
- Coupled Diffusion and Reaction Processes in Rock Matrices: Impact on Dilute Groundwater Plumes
- Phytostabilisation Development on Metal-Contaminated Soils to Produce Energy: Ecological Viability, Social Advantages and Economic Assessment
- Assessment of Hexavalent Chromium Natural Attenuation for the Hanford Site 100 Area
- Perfluorinated Compounds Interim Guidance
- Eighth Symposium on Design and Construction Issues at Hazardous Waste Sites

EUGRIS Corner. New Documents on EUGRIS, the platform for European contaminated soil and water information. More than 13 resources, events, projects and news items were added to EUGRIS in February 2016. These can be viewed at <http://www.eugris.info/whatsnew.asp>. Then select the appropriate month and year for the updates in which you are interested. The following resource was posted on EUGRIS:

The Remediated Sites and Brownfields-Success Stories in Europe (2015). This document collects cases and successful stories of remediated sites and brownfields. It aims to contribute to a better understanding of the remediation of contaminated sites and brownfields rehabilitation which is essential for sustainable land use management and to share best practices and new techniques in soil remediation and management of contaminated sites, meanwhile raising awareness of the enormous efforts needed to succeed. This document presents examples of success stories of remediation of contaminated soils in various contexts and different European countries. View or download at

<http://esdac.jrc.ec.europa.eu/content/remediated-sites-and-brownfields%E2%80%93success-stories-europe>

> Conferences and Symposia

Intersol 2016 - International Conference-Exhibition on Soils, Sediments and Water, Lille, France, March 15-17, 2016. Intersol 2016 themes cover polluted sites and soils and health

risks, pollution diagnoses, and research on toxicological and eco-toxicological effects. For more information and to register, see <http://www.intersol.fr/>.

Groundwater High-Resolution Site Characterization (HRSC), Denver, CO, March 22-23, 2016. This training course focuses on groundwater characterization and discusses (1) the impacts of subsurface heterogeneity on the investigation and cleanup of groundwater and related media, (2) the need for scale-appropriate measurements and adequate data density, and (3) the tools and strategies that are available to overcome the impacts of subsurface heterogeneity.

After taking this course, participants will be armed with information that will allow them to improve their subsurface investigation approaches and develop more realistic and comprehensive conceptual site models (CSM). CSMs developed based on HRSC strategies and tools will decrease site uncertainty, improve the remedy selection process for groundwater remedies, and better enable the evaluation, design, and implementation of targeted in situ and ex situ groundwater remedies. The Groundwater HRSC course is an advanced 2-day course. The recommended audience includes EPA, federal, state, tribal and private industry technical project managers, practitioners and other stakeholders involved in groundwater investigation and remediation. For more information and to register, see <https://trainex.org/hrsc>.

LNAPLs: Science, Management, and Technology - ITRC 2-day Classroom Training, Atlanta (area), GA, April 5-6, 2016. Led by internationally recognized experts, this 2-day ITRC classroom training will enable you to develop and apply an LNAPL Conceptual Site Model (LCSM), understand and assess LNAPL subsurface behavior, develop and justify LNAPL remedial objectives including maximum extent practicable considerations, select appropriate LNAPL remedial technologies and measure progress, and use ITRC's science-based LNAPL guidance to efficiently move sites to closure. Interactive learning with classroom exercises and Q&A sessions will reinforce these course learning objectives. For local, state, and federal government; students; community stakeholders; and tribal representatives, ITRC has a limited number of scholarships (waiver of registration fee only) available. For more information and to register, see <http://www.itrcweb.org/training>.

ITRC Annual Meeting, Minneapolis, MN, April 18-22, 2016. The 2016 ITRC Annual Meeting will bring together environmental professionals from across the country for an opportunity to network and collaborate on innovative approaches to solving environmental challenges. Meeting opportunities include: work sessions for all 2016 ITRC Teams, information about ITRC's direction from the new ITRC Director and Board of Advisors, Opportunities to network with the environmental community, an opportunity to hear about our latest draft documents: Bioavailability in Contaminated Soil and Characterization and Remediation in Fractured Rock. For more information and to register, see <http://itrcweb.org/Meetings/Upcoming>.

9th Symposium on Design and Construction Issues at Hazardous Waste Sites, Philadelphia, PA, April 20-22, 2016. The applications of engineering and science associated with cleaning up hazardous waste sites continue to evolve rapidly. The goal of this symposium, co-hosted by the Society of American Military Engineers (SAME) Philadelphia Post and the U.S. EPA, is to facilitate an interactive engagement between professionals from government and the private sector related to relevant and topical issues affecting our field. For more information and to register, see <http://secure.sameposts.org/franchises/philadelphia/events/634>.

Petroleum Vapor Intrusion: Fundamentals of Screening, Investigation, and Management - ITRC 2-day Classroom Training, Denver, CO, May 9-10, 2016. This 2-day ITRC classroom training is based on the ITRC Technical and Regulatory Guidance Web-Based Document, Petroleum Vapor Intrusion: Fundamentals of Screening, Investigation, and Management (PVI-1, 2014) and led by internationally recognized experts. The class will enable you to develop on-the-job skills to screen-out petroleum sites based on the scientifically-supported ITRC strategy and checklist; focus the limited resources investigating those PVI sites that truly represent an unacceptable risk; communicate ITRC PVI strategy and justify science-based decisions to management, clients, and the public; understand the essential principles of biodegradation and the fundamentals of vapor movement through the vadose zone; and

appreciate the important role of modeling in the investigation of petroleum sites. Interactive learning with classroom exercises and Q&A sessions will reinforce these course learning objectives. You will also have the opportunity to network with other environmental professionals. For local, state, and federal government; students; community stakeholders; and tribal representatives, ITRC has a limited number of scholarships (waiver of registration fee only) available. For more information and to register, see <http://www.itrcweb.org/training>.

NOTE: For TechDirect, we prefer to concentrate mainly on new documents and the Internet live events. However, we do support an area on CLU-IN where announcement of conferences and courses can be regularly posted. We invite sponsors to input information on their events at <https://clu-in.org/courses>. Likewise, readers may visit this area for news of upcoming events that might be of interest. It allows users to search events by location, topic, time period, etc.

If you have any questions regarding TechDirect, contact Jeff Heimerman at (703) 603-7191 or heimerman.jeff@epa.gov. Remember, you may subscribe, unsubscribe or change your subscription address at <https://clu-in.org/techdirect> at any time night or day.

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