



TechDirect, November 1, 2017

Welcome to TechDirect! Since the October 1 message, TechDirect gained 293 new subscribers for a total of 39,609. 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 Opportunities

Request for Proposals: FY 2018 Brownfields Environmental Workforce Development and Job Training Grants. These grants are provided to eligible entities, including nonprofit organizations, to develop environmental programs that recruit, train, and place unemployed and under-employed residents of communities affected by brownfields and other environmental contaminants with the skills needed to secure full-time, sustainable employment in the environmental field and in assessment and cleanup work taking place in their communities. Each Environmental Workforce Development and Job Training (EWDJT) grant may be funded up to \$200,000 over a three year period. The proposal submission deadline is December 15, 2017, and a webinar to assist in preparing proposals will be held on November 7, 2017 at 1:30 p.m. ET. For more information and application instructions, see

<https://www.epa.gov/brownfields/announcing-new-request-proposals-fy-2018-environmental-workforce-development-and-job-0>.

FY 2019 Strategic Environmental Research and Development Program (SERDP) Solicitations. The Department of Defense's SERDP is seeking environmental research and development proposals for funding beginning in FY 2019. Projects will be selected through a competitive process. The Core Solicitation provides funding opportunities for basic and applied research and advanced technology development. Core projects vary in cost and duration consistent with the scope of the work proposed. The Statements of Need (SON) referenced by this solicitation request proposals related to the SERDP program areas of Environmental Restoration (ER), Munitions Response (MR), Resource Conservation and Resiliency (RC), and Weapons Systems and Platforms (WP). The SERDP Exploratory Development (SEED) Solicitation provides funding opportunities for work that will investigate innovative environmental approaches that entail high technical risk or require supporting data to provide proof of concept. Funding is limited to not more than \$200,000 and projects are approximately one year in duration. This year, SERDP is requesting SEED proposals for the Munitions Response program area. All

Core pre-proposals are due January 4, 2018. SEED proposals are due March 6, 2018. For more information and application instructions, see <https://www.serdp-estcp.org/Funding-Opportunities/SERDP-Solicitations>.

> Upcoming Live Internet Seminars

SERDP & ESTCP Webinar Series: Platforms for Underwater and Near-Shore Munitions Survey - November 2, 2017, 12:00PM EDT (16:00 GMT). SERDP and ESTCP have launched a webinar series to promote the transfer of innovative, cost-effective and sustainable solutions developed through projects funded in five program areas. The webinar series targets Department of Defense and Department of Energy practitioners, the regulatory community and environmental researchers with the goal of providing cutting edge and practical information that is easily accessible at no cost. Dr. Dan Steinhurst will present on the results of efforts to return the Marine Towed Array (MTA) to service and validate the new electromagnetic imaging array's design for UXO detection and classification in the underwater environment. Dr. Gregory Schultz will discuss the near-shore deployment of geophysical sensor arrays from remotely and autonomously operated platforms. For more information and to register, see <http://serdp-estcp.org/Tools-and-Training/Webinar-Series>.

Mining Sites Webinar Series

Matching Biochar Characteristics with Metals-Contaminated Soils to Effectively Reduce Metal Bioavailability at Mining Sites - November 7, 2017, 1:00PM-3:00PM EST (18:00-20:00 GMT). There are approximately 500,000 abandoned mines across the U.S., which pose a considerable, pervasive risk to human health and the environment due to possible exposure to the residuals of heavy metal extraction.

Historically, a variety of chemical and biological methods have been used to reduce the bioavailability of the metals at abandoned mine sites. Biochar is emerging as a novel soil amendment for agriculture and environmental applications that can be used to increase soil carbon, adjust soil pH, supply and retain nutrients, reduce heavy metal bioavailability, improve soil water holding and infiltration, sequester carbon, and provide refugia for soil organisms. Biochar is a charcoal-like, carbon-rich, porous byproduct of thermal pyrolysis or gasification. What makes biochar unique is that its properties are tunable, meaning that they can be manipulated or adjusted to optimize the benefits of using it as a soil amendment. It has the potential to complex and immobilize heavy metals to reduce bioavailability in situ. Simultaneously, biochar can improve soil conditions for plant growth and promote the establishment of a soil-stabilizing native plant community to reduce offsite movement of metal-laden waste materials. Because biochar properties depend upon feedstock selection, pyrolysis production conditions, and the activation procedures used, they can be designed to meet specific remediation needs and specific soil remediation situations. However, techniques are needed to optimally match biochar characteristics with metals contaminated soils to effectively reduce metal bioavailability. Ongoing research at Formosa Mine in Oregon and other sites to immobilize heavy metals from tailings and revegetate the soil will be presented. For more information and to register, see <http://clu-in.org/live>.

ITRC Long-term Contaminant Management Using Institutional Controls - November 14, 2017, 1:00PM-3:15PM EST (18:00-20:15 GMT). Institutional controls (ICs) are administrative or legal restrictions that provide protection from exposure to contaminants on a site. When ICs are jeopardized or fail, direct exposure to human health and the environment can occur. While a variety of guidance and research to date has focused on the implementation of ICs, ITRC's Long-term Contaminant Management Using Institutional Controls (IC-1, 2016) guidance and this associated training class

focuses on post-implementation IC management, including monitoring, evaluation, stakeholder communications, enforcement, and termination. The ITRC guidance and training will assist those who are responsible for the management and stewardship of ICs. After attending the training, participants will be able to: describe best practices and evolving trends for IC management at individual sites and across state agency programs; use this guidance to improve IC reliability and prevent IC failures, improve existing, or develop new, IC Management programs, identify the pros and cons about differing IC management approaches; use the tools to establish an LTS plan for specific sites; and use the elements in the tools to understand the information that should populate an IC registry or data management system. For more information and to register, see <http://www.itrcweb.org> Or <http://clu-in.org/live>.

First-Timer's Guide to the 2017 National Brownfields Training Conference - November 15, 2017, 1:00PM-3:00PM EST (18:00-20:00 GMT). New to the 2017 National Brownfields Training Conference? This session will help you get the most out of your visit to Pittsburgh and connect you with longtime brownfields professionals who keep coming back to learn the latest community revitalization practices. The session will feature perspectives from government, nonprofits and consultants, who will share tips about how to make the most out of your first experience at the National Brownfields Training Conference. For more information and to register, see <http://clu-in.org/live>.

ITRC Petroleum Vapor Intrusion: Fundamentals of Screening, Investigation, and Management - November 16, 2017, 1:00PM-3:15PM EST (18:00-20:15 GMT). Chemical contaminants in soil and groundwater can volatilize into soil gas and migrate through unsaturated soils of the vadose zone. Vapor intrusion (VI) occurs when these vapors migrate upward into overlying buildings through cracks and gaps in the building floors, foundations, and utility conduits, and contaminate indoor air. If present at sufficiently high concentrations, these vapors may present a threat to the health and safety of building occupants. Petroleum vapor intrusion (PVI) is a subset of VI and is the process by which volatile petroleum hydrocarbons (PHCs) released as vapors from light nonaqueous phase liquids (LNAPL), petroleum-contaminated soils, or petroleum-contaminated groundwater migrate through the vadose zone and into overlying buildings. The ITRC Technical and Regulatory Guidance Web-Based Document, Petroleum Vapor Intrusion: Fundamentals of Screening, Investigation, and Management (PVI-1, 2014) and this associated Internet-based training provides regulators and practitioners with consensus information based on empirical data and recent research to support PVI decision making under different regulatory frameworks. The PVI assessment strategy described in this guidance document enables confident decision making that protects human health for various types of petroleum sites and multiple PHC compounds. This guidance provides a comprehensive methodology for screening, investigating, and managing potential PVI sites and is intended to promote the efficient use of resources and increase confidence in decision making when evaluating the potential for vapor intrusion at petroleum-contaminated sites. By using the ITRC guidance document, the vapor intrusion pathway can be eliminated from further investigation at many sites where soil or groundwater is contaminated with petroleum hydrocarbons or where LNAPL is present. For more information and to register, see <http://www.itrcweb.org> Or <http://clu-in.org/live>.

Adverse Outcome Pathways: Session II - Assembling and Assessing AOP Information - November 29, 2017, 1:00PM-3:00PM EST (18:00-20:00 GMT). The NIEHS Superfund Research Program (SRP) is hosting a seminar series focused on adverse outcome pathways (AOPs), which are structured ways to represent biological events leading to adverse health effects. In the second session, presenters will discuss the development of AOPs and how they may be used to support hazard and risk assessment. Carole Yauk, Ph.D., will briefly review common AOP development principles, including identifying key events, and assembling and weighing the evidence to support key event relationships and the overall AOP. A case study will then walk

through development of one AOP using the AOP wiki. Using alkylation of DNA as the molecular initiating event, subsequent key events that are measurable and essential will be identified. Key event relationships will be identified and evaluated by assessing the dose, incidence and temporal relationships among the events. The essentiality of each event to the adverse outcome, heritable mutations, will be assessed and the empirical evidence supporting the AOP, and any uncertainties, will be evaluated. Ed Perkins, Ph.D., will discuss efforts to merge the AOP's simple framework for linking effects to a regulated outcome with more biological pathways and measurements such as omics that try to capture the complexity of biology in order to support hazard and risk assessment.

Examples will be given on how 'omics and other data can be used in the context of AOPs to assess chemical mixture impacts and how in vitro or in vivo data can be used to determine the likelihood of an AO occurring (e.g. Bayesian AOP networks and mechanistic qAOPs). The AOP framework provides a logical mechanism based structure for formalizing and visualizing the molecular intersection between chemical and nonchemical stressors. However, the impact and relevance of biomedical research public health protection from chemical and nonchemical exposures depends both on the understanding of mechanisms embedded in the AOP framework, and how exposures themselves affect those mechanisms and the likelihood of adverse outcomes. Justin Teeguarden, Ph.D., will introduce similar frameworks for organizing exposure information (like the aggregate exposure pathway (AEP)) and discuss how they can provide critical information about the magnitude of the stress and key information about how environmental concentrations can be related to human exposures. He will also discuss how exposures in studies conducted in vitro or an animal models can be related to human exposures. For more information and to register, see <http://clu-in.org/live>.

> New Documents and Web Resources

Investigative Strategies for Lead-Source Attribution at Superfund Sites Associated with Mining Activities. Identification of potentially responsible parties is complicated because Superfund sites can have a long history of use and involve contaminants that can have many sources. Such is often the case for mining sites that involve metal contamination; metals occur naturally in the environment, they can be contaminants in the wastes generated at or released from the sites, and they can be used in consumer products, which can degrade and release the metals back to the environment. This report examines the extent to which various sources contribute to environmental lead contamination at Superfund sites that are near lead-mining areas and focuses on sources that contribute to lead contamination at sites near the Southeast Missouri Lead Mining District. It recommends potential improvements in approaches used for assessing sources of lead contamination at or near Superfund sites (October 2017, 112 pages). View or download at <https://doi.org/10.17226/24898>.

Superfund Research Program Research Brief 274: Endophytes Help Poplar Trees Clean Up TCE on Superfund Site. Poplar trees can capture and remove trichloroethylene (TCE) from the soil and degrade it. Now, a method using endophytes, symbiotic microbes that live within a plant, has been successfully shown to boost the speed and effectiveness of this natural degradation process. Researchers led by Edenspace Systems Corporation, a Superfund Research Program (SRP)-funded small business, conducted the first large-scale experiment on a Superfund site using poplar trees fortified with a microbial endophyte to clean up TCE-contaminated groundwater. TCE is a known human carcinogen that is widely used as a metal degreasing agent and has been found in groundwater at many military and Superfund sites. After inoculating poplar trees with a specific endophyte strain, the researchers successfully showed that the endophyte-assisted poplars quickly and effectively removed TCE, decreasing

concentrations in groundwater from 300 to 5 micrograms per liter. For more information, see https://tools.niehs.nih.gov/srp/researchbriefs/view.cfm?Brief_ID=274. 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:

- Revised Groundwater Pilot Test Report and Expanded Pilot Test Work Plan, Quail Crossing Neighborhood, Andover, Kansas
- Pilot Testing of a Biological Treatment Process (Biottra) for the Removal of TCE, TCP, DBCP and Nitrate
- Sediment Management Methods to Reduce Dredging, Part 2: Sediment Collector Technology
- CEST 2017: 15th International Conference on Environmental Science and Technology, 31 August - 2 September 2017, Rhodes, Greece
- The Eleventh Washington Hydrogeology Symposium: Program and Abstracts
- Organic Bioreactor Pilot Study Work Plan
- Assessing the Potential Consequences of Subsurface Bioremediation: Fe-Oxide Bioreductive Processes and the Propensity for Contaminant-Colloid Co-Transport and Media Structural Breakdown
- Toolkits for Evaluation of Monitored Natural Attenuation and Natural Source Zone Depletion
- A Guide for Using Geochemical Methods in Dredged Material, Sediment Tracking, and Sediment Budget Studies
- Phytoforensics: Using Trees to Find Contamination

EUGRIS Corner. New Documents on EUGRIS, the platform for European contaminated soil and water information. More than 27 resources, events, projects and news items were added to EUGRIS in October 2017. 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:

Risk Assessment of Nanomaterials. Produced by the UK's Parliamentary Office of Science and Technology in 2017. The unique properties of engineered nanomaterials are beneficial to a range of industries. However, uncertainties in assessing their potential health and environmental risks could hinder their safe use. This POSTnote summarises the current regulation of nanomaterials and highlights potential future directions for regulatory testing approaches. View or download at <http://researchbriefings.parliament.uk/ResearchBriefing/Summary/POST-PN-0562>.

> Conferences and Symposia

Groundwater High-Resolution Site Characterization (HRSC), Dallas, TX, November 15-16, 2017. 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>.

Registration Now Open! 2017 National Brownfields Training Conference, Pittsburgh, PA, December 5-7, 2017. With the session selection process completed, Brownfields 2017 is set to offer attendees a robust and expansive conference experience. This year's conference programming and speakers will engage attendees on topics at the forefront of today's brownfields and economic development landscapes; challenging both emerging and seasoned professionals as well as a diverse range of brownfields stakeholders to think outside the norms when addressing land revitalization and redevelopment. Take advantage and register during the pre-registration period for the lowest conference registration fees. For more information and to register, see <https://www.brownfields2017.org/register/>.

Implementing Greener Cleanups Through ASTM's Standard Guide (E2893-16) - A Workshop, Pittsburgh, PA, December 4, 2017. This 90-minute training session is one of three comprising the "Streamlined Practices for Brownfields Site Characterization and Cleanup" pre-conference workshop offered at Brownfields 2017. The session will focus on helping participants engage communities in site cleanup decisions and transforming contaminated sites into community assets while using the core elements of green remediation—energy, air, water, materials and waste, and land and ecosystems. Participants will learn the methods and tools for reducing a project's environmental footprint, the importance of a footprint assessment, how to apply science and engineering principles at a site, and best management practices for site optimization. Green remediation application case studies along with lessons learned will be presented. For more information and to register, see <https://www.brownfields2017.org/education/pre-conference-workshops/>.

Improving Management of the Brownfields Cleanup Process: Follow the Road Map, Pittsburgh, PA, December 4, 2017. This 90-minute training session is one of three comprising the "Streamlined Practices for Brownfields Site Characterization and Cleanup" pre-conference workshop offered at Brownfields 2017. The session is designed to help Brownfields grant recipients, who are often non-technical stakeholders, learn how to better find and hire the right contractor, integrate innovation, interpret technical reports, prepare contracts, manage the budget, monitor progress, and become more involved in the decision-making process. Grantees will learn to oversee the process for gathering and using environmental data to ensure the data is adequate and appropriate to make a decision. For more information and to register, see <https://www.brownfields2017.org/education/pre-conference-workshops/>.

Innovative Brownfields Characterization and Cleanup Solutions: Training for Small Business Contractors, Pittsburgh, PA, December 4, 2017. This 90-minute training session is one of three comprising the "Streamlined Practices for Brownfields Site Characterization and Cleanup" pre-conference workshop offered at Brownfields 2017. The session will provide information about innovative technologies and practices for improving and achieving cleanup at Brownfields sites. Participants will learn the application and tools necessary to implement for innovative practices such as incremental composite sampling, high-resolution site characterization, three dimensional visualization and analysis, and the use of conceptual site models to help reduce uncertainties in site cleanup and communicate site conditions better to all stakeholders.

Topics will include in situ remediation technologies such as thermal treatment, chemical oxidation/reduction, and enhanced bioremediation. Participants also will learn the use of field tools to assist in the creation of dynamic work plans to allow for-and achieve-faster site cleanup. For more information and to register, see

<https://www.brownfields2017.org/education/pre-conference-workshops/>.

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 Jean Balent at (703) 603-9924 or balent.jean@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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