



TechDirect, October 1, 2019

Welcome to TechDirect! Since the September 1 message, TechDirect gained 63 new subscribers for a total of 39,188. 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.

> EPA Funds PFAS Research

EPA Awards \$6 Million to Research Potential Environmental Impacts of PFAS Substances in Waste Streams.

The US Environmental Protection Agency (EPA) announced approximately \$6 million to fund research by eight organizations to expand the understanding of the environmental risks posed by per- and poly-fluoroalkyl substances (PFAS) in waste streams and identify practical approaches to manage the potential impacts as PFAS enters the environment. Research projects funded under this work will examine the chemical process for the destruction of PFAS in leachate and groundwater, investigate the feasibility of electron beam technology for the destruction of PFAS compounds during the remediation of groundwater, wastewater, sewage sludges, and soils, as well as investigate the fate of PFAS passing through typical landfill liner systems, and test the ability to break down PFAS in landfill leachate using soundwaves. For more information, visit

<https://www.epa.gov/newsreleases/epa-awards-6-million-research-potential-environmental-impacts-pfas-substances-waste>.

> Upcoming Live Internet Seminars

Federal Facilities Online Academy - October 1, 2019 through September 14, 2020.

This voluntary training program has been developed for EPA RPMs, project managers from other federal agencies, State government, and Tribal groups who work on federal facility Superfund cleanups. Please consider participating in all 12 courses - 11 Webinars and 1 In-Person Training - to obtain a certificate upon completion of the entire Federal Facility Academy series. For more information and to register, see

<https://trainex.org/offeringslist.cfm?courseid=1819>.

US EPA Office of Research and Development's Office of Science Policy Mine and Mineral Processing Virtual Workshop Series - October 2, 9, 16, and 23, 2019.

EPA's Office of Research and Development's Office of Science Policy and Center for Environmental Solutions & Emergency Response is sponsoring a 4-part virtual workshop series to address characterization, remediation, and response challenges at Superfund and legacy mining and mineral processing sites. Each virtual workshop will include a short lecture by various subject matter experts in their respective fields but will also allow ample time for the presenters to interact with the audience, including time for questions and answers as well as brainstorming and identifying concerns from stakeholders participating in each virtual workshop. If you have a mining reclamation or remediation site, this is the virtual workshop for you! For more information and to register, see <https://clu-in.org/live>.

Bioremediation - Expanding the Toolbox - October 3 & 11, 2019. This series emphasizes new approaches to elucidate mechanisms responsible for bioremediation. The series features innovative molecular, biochemical, cellular, and/or engineering tools to advance our understanding of the structural and functional properties of microorganisms or plants involved in the bioremediation of hazardous substances. The second session on October 3 will highlight innovative genomic approaches to enhance bioremediation by microbes and plants, and the third session on October 10 will highlight new and emerging tools to improve existing bioremediation approaches and improve human health. For more information and to register, see <https://clu-in.org/live>.

SURF Webinar: Sustainable Remediation 10 Years Later - October 8, 2019, 1:00 PM EDT (17:00 GMT). The webinar will focus on progress (and sometimes the lack of progress) made in sustainable remediation and the state of the sustainable remediation practiced today. The paper also explores how sustainable remediation may evolve over the next 10 years and focuses on the events and drivers that can be significant in the pace of further development of the practice. For more information and to register, <https://www.sustainableremediation.org/news/2019/9/23/surf-webinar-ten-years-later-the-progress-and-future-of-integrating-sustainable-principles-practices-and-metrics-into-remediation-projects>.

ITRC Connecting the Science to Managing LNAPL Sites a 3 Part Series - October 8, 15, and 22, 2019. The newly updated LNAPLs (Light Non-Aqueous Phase Liquids) 3-part training course series is based on the ITRC guidance: LNAPL Site Management: LCSM Evolution, Decision Process, and Remedial Technologies (LNAPL-3, 2018) and focuses on connecting the science to managing LNAPL sites and helping you: build upon your understanding of LNAPL behavior in the subsurface (Part 1), develop your LNAPL conceptual site model and LNAPL remedial goals (Part 2), and select/implement LNAPL technologies (Part 3). After this training series, the expectation is that you will have the skills and understanding to use ITRC science-based resources to improve decision making at your LNAPL sites. For regulators and other government agency staff, this improved understanding can hopefully be incorporated into your own LNAPL programs. It is expected that participants will attend this 3-part training series in sequence. For more information and to register, see <https://www.itrcweb.org> or <https://clu-in.org/live>.

ITRC Bioavailability of Contaminants in Soil: Considerations for Human Health Risk Assessment - October 10, 2019, 1:00PM-3:15PM EDT (17:00-19:15 GMT). The basis for this training course is the ITRC guidance: Bioavailability of Contaminants in Soil: Considerations for Human Health Risk Assessment (BCS-1). This guidance describes the general concepts of the bioavailability of contaminants in soil, reviews the state of the science, and discusses how to incorporate bioavailability into the human health risk assessment process. The target audience for this guidance and training course are: project managers interested in decreasing uncertainty in the risk

assessment which may lead to reduced remedial action costs, and risk assessors new to bioavailability or those who want additional confidence and training in the current methods and common practices for using bioavailability assessment to more accurately determine human health risk at a contaminated site. As a participant in this training you should learn to: apply the decision process to determine when a site-specific bioavailability assessment may be appropriate, use the ITRC Review Checklist to develop or review a risk assessment that includes soil bioavailability, consider factors that affect arsenic, lead and PAH bioavailability, select appropriate methods to evaluate soil bioavailability, and use tools to develop site-specific soil bioavailability estimates and incorporate them into human health risk assessment. For more information and to register, see <https://www.itrcweb.org> or <https://clu-in.org/live>.

US EPA Office of Research and Development Contaminated Sediments Virtual Workshop Series - October 21, 30, November 13, 20, 2019. The US EPA Office of Research and Development / Office of Science Policy (ORD/OSP) in cooperation with the Office of Land and Emergency Management (OLEM) is sponsoring a 4-part virtual workshop series to address current challenges at contaminated sediment sites. The aim of the virtual workshop is to provide interactive discussions between subject matter expert panelists and workshop participants. Consequently, each virtual session will feature brief topic introductions by panelists followed by facilitated panelist/participant discussions which will include opportunities for questions and answers, brainstorming, identification of concerns and research needs, and quick spot surveys. For more information and to register, see <https://clu-in.org/live>.

ITRC Petroleum Vapor Intrusion: Fundamentals of Screening, Investigation, and Management - October 24, 2019, 1:00PM-3:15PM EDT (17:00-19:15 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 provide 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 <https://www.itrcweb.org> or <https://clu-in.org/live>.

Considerations for Bulkheading Draining Mine Tunnels - October 25, 2019, 2:00PM-4:00PM EDT (18:00-20:00 GMT). Historically, underground hard rock mines are abandoned after the ore is mined out. Water then seeps into the fractures, mined out veins, and other mine workings where it combines with oxidized minerals to form sulfuric acid which then brings heavy metals into solution which then flows out as acid mine drainage (AMD). The AMD impacts the surrounding streams by providing a

steady influx of acidic metal rich water, as well as surges of AMD from the collapse of underground dams where AMD has pooled. Such surges and sometimes all flows can be controlled by installing concrete plugs (bulkheads) in strategic locations. This webinar will address underground bulkheads in general and will present specific examples from Region 8 of bulkhead installations and water quality changes, including those at Dinero Tunnel, Pennsylvania Mines, and Captain Jack Mill sites. For more information and to register, see <https://clu-in.org/live>.

> New Documents and Web Resources

Green Remediation Best Management Practices: Excavation and Surface Restoration (EPA 542-F-19-002). Excavation of soil, sediment or waste material is often undertaken at contaminated sites to address immediate risk to human health or the environment; prepare for implementation of remediation technologies and construction of supporting infrastructure; and address contaminant hot spots in soil or sediment. The excavation and subsequent backfilling processes rely on use of heavy earth-moving machinery and often involve managing large volumes of material. Many opportunities exist to reduce the environmental footprint of the various cleanup activities and improve ultimate restoration of the disturbed land, surface water and ecosystems. The updated "Green Remediation Best Management Practices: Excavation and Surface Restoration" fact sheet issued by the U.S. Environmental Protection Agency outlines specific best management practices (BMPs) that can be used to minimize the environmental footprint concerning emission of air pollutants and use of water, energy, and other resources at excavation sites. The refined set of BMPs is based on recent experiences reported by regulators, property owners, cleanup service contractors and other stakeholders in the cleanup community (August 2019, 5 pages). View or download at <https://clu-in.org/greenremediation/>.

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:

- Voluntary Remediation Program Compliance Status Report: Thomasville National Bank, 301 N. Broad Street, Thomasville, Thomas County, Georgia
- Development and Optimization of Analytical Methods for Simultaneous Determination of IM and Legacy Explosive Compounds
- The Use of Advanced Molecular Biological Tools in Groundwater Contaminated with Chlorinated Solvents [Webinar]
- A Rigorous Demonstration of Permeability Enhancement Technology for In Situ Remediation of Low Permeability Media
- Hexavalent Chromium Treatment Technologies
- Assessment of Pump-and-Treat System Impacts on 200 West Aquifer Conditions: Interim Status Report
- PFAS and Other Emerging Contaminants Conference
- Green Remediation Best Management Practices: Sites with Leaking Underground Storage Tanks
- Geophysical Methods for Characterization and Monitoring at Groundwater Remediation Sites

Superfund Research Program (SRP) Research Brief 295: Model Predicts PAH Levels in Important Tribal Food Source. A sediment passive sampling model can be

used to accurately predict the concentration of polycyclic aromatic hydrocarbons (PAHs) in butter clams, according to a recent Superfund Research Program (SRP) study. View more information at https://tools.niehs.nih.gov/srp/researchbriefs/view.cfm?Brief_ID=295

EUGRIS Corner. New Documents on EUGRIS, the platform for European contaminated soil and water information. More than 10 resources, events, projects and news items were added to EUGRIS in September 2019. 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:

Overview of a large scale Phytoremediation in the USA. With the Great Lakes Restoration Initiative, the Forest Service works in partnership with cities, counties, and corporations to install phytoremediation sites. The initiative is in its fourth year of annual funding, and altogether, about 20,000 trees have been planted at 16 phytoremediation sites in the Lake Michigan and Lake Superior watersheds. The trees are mostly fast-growing willows and poplars, which are ideal for phytoremediation because they grow quickly and have deep and extensive root systems. View more information at <https://www.usda.gov/media/blog/2019/08/30/trees-can-do-dirty-work-waste-cleanup> .

CL:AIRE Bulletin: Bio-restoration of metal-contaminated soil using biochar to enhance the productivity of marginal land (2019). CL:AIRE's INSPIRATION bulletins describe practical aspects of research which have direct application to the management of contaminated soil or groundwater in an agricultural context. This bulletin describes how the properties of biochar can influence its performance for the restoration of metal-polluted soil. View more information at <https://www.clare.co.uk/component/phocadownload/category/66-inspiration-bulletins?download=692:ib8-bio-restoration-of-metal-contaminated-soil-using-biochar-to-enhance-the-productivity-of-marginal-land-2019> .

> Conferences and Symposia

2019 Design and Construction Issues at Hazardous Waste Sites (DCHWS) - West, Denver, CO, November 4-6, 2019. The Society of American Military Engineers Denver Metro Post is holding the third DCHWS-West Symposium to encourage dialogue and information sharing on design and construction issues relevant to hazardous waste sites in the western United States. The applications of engineering and science associated with cleaning up hazardous waste sites continue to evolve rapidly. The Symposium goal 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 <https://www.same.org/Get-Connected/Find-a-Post/Denver/DCHWS-WEST>.

Groundwater High-Resolution Site Characterization (HRSC), Boston, MA, November 13-14, 2019. 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>.

Best Practices for Site Characterization Throughout the Remediation Process, Lenexa, KS, December 3-5, 2019. This training course is based on best management practices (BMP) implemented by the U.S. EPA, partnership organizations, federal and state partners, and consultants. Participants will learn how to streamline projects in a legal, technically sound, and cost-effective manner. By taking the course, participants achieve the following objectives: integrate best practices into traditional project activities, effectively collect and communicate critical project information, design dynamic work strategies, recognize and overcome the challenges presented while implementing a dynamic work strategy, and use BMPs to support all phases of the environmental cleanup life cycle. For more information and to register, see <https://www.trainex.org/BPSCR>.

2019 National Brownfields Training Conference, Los Angeles, CA, December 11-13, 2019. The National Brownfields Training Conference is the largest event in the nation focused on environmental revitalization and economic redevelopment. Held every two years, the National Brownfields Conference attracts nearly 3,000 stakeholders in brownfields redevelopment and cleanup to share knowledge about sustainable reuse and celebrate the EPA brownfields program's success. For more information and to register, see <https://brownfields2019.org>.

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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