



TechDirect, April 1, 2022

Welcome to TechDirect! Since the March 1 message, TechDirect gained 61 new subscribers for a total of 40,188. 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.

> Upcoming Live Internet Seminars

SERDP & ESTCP Developments in Wastewater Treatment and Reuse at DoD Facilities - April 7, 2022, 12:00 PM EDT (17:00 GMT). Join SERDP and ESTCP for a webinar featuring DoD-funded research efforts to improve wastewater treatment and reuse at DoD facilities. First, Dr. Chris Griggs (U.S. Army Engineer Research and Development Center) will discuss the assessment of a baffled bioreactor-based greywater reuse system, which is capable of harvesting 8,000 gallons of freshwater from greywater per day. Then, Dr. Wei Liao will talk about the development of a self-sustainable and scalable organic waste and wastewater treatment system that also produces freshwater and energy by integrating solar, biological, electrochemical, and membrane technologies. For more information and to register, please visit <https://www.serdp-estcp.org/Tools-and-Training/Webinar-Series/04-07-2022>.

Federal Facilities Online Academy: Military Munitions Policy Overview - Apr 13, 2022, 1:00PM-3:00PM EDT (17:00-19:00 GMT). Military Munitions Policy Webinar is a two-hour webinar course that provides an overview of the Department of Defense (DoD) Military Munitions Response Program (MMRP), munitions policies, and how the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) is applied to munitions sites. For more information and to register, please visit <https://clu-in.org/live>.

Utilizing Innovative Materials Science Approaches to Enhance Bioremediation: Session I - Per- and Polyfluoroalkyl substances - Apr 15, 2022, 1:00PM-3:00PM EDT (17:00-19:00 GMT). The NIEHS Superfund Research Program (SRP) is hosting a Progress in Research webinar series to showcase new breakthroughs to advance sustainable solutions for hazardous substances in the environment. The three-part series will feature SRP individual research projects funded in 2020, who are incorporating new advances in materials science to optimize bioremediation of

contaminants in soil, sediment, or water. In each session, awardees will describe their research projects, accomplishments, and next steps. The first session will highlight sustainable technologies to break down and remove per- and polyfluoroalkyl substances (PFAS) from the environment. For more information and to register, please visit <https://clu-in.org/live>.

ITRC Incremental Sampling Methodology (ISM-2) Update - Q&A Panel Discussion - Apr 19, 2022, 1:00PM-2:00PM EDT (17:00-18:00 GMT). Prepare for the Expert Panel by reviewing the archived two sessions (Session 1 for Module 1-3 or Session 2 for Module 4-6) that cover an overview of ISM and present five sections from the ITRC guidance document (ISM-2, 2020). The archived sessions are available at https://clu-in.org/conf/itrc/ism2_031121/. To register for the panel discussion, please visit <https://www.itrcweb.org> or <https://clu-in.org/live>.

ITRC Strategies for Preventing and Managing Harmful Cyanobacteria Blooms (Two Part Series) - April 26 and 28, 2022. Cyanobacteria are microscopic, photosynthetic organisms that occur naturally in all aquatic systems but most often in freshwater systems. Under certain conditions, cyanobacteria can multiply and become very abundant, discoloring the water throughout a water body or accumulating at the surface. These occurrences are known as blooms. Cyanobacteria may produce potent toxins (cyanotoxins) that pose a threat to human health. They can also harm wildlife and domestic animals, aquatic ecosystems, and local economies by disrupting drinking water systems and source waters, recreational uses, commercial and recreational fishing, and property values. It is likely that continued population growth, land use change, increases in nutrient inputs to our waterways, and the warming climate will favor proliferation of these problematic species. Providing a range of practical approaches to minimize these blooms and their likely societal and wildlife effects is critical to our future vitality, health, and economic prosperity. For more information and to register, see <https://www.itrcweb.org> or <https://clu-in.org/live>.

Utilizing Innovative Materials Science Approaches to Enhance Bioremediation: Session II - Chlorinated Compounds - Apr 29, 2022, 1:00PM-3:00PM EDT (17:00-19:00 GMT). The NIEHS Superfund Research Program (SRP) is hosting a Progress in Research webinar series to showcase new breakthroughs to advance sustainable solutions for hazardous substances in the environment. The three-part series will feature SRP individual research projects funded in 2020, who are incorporating new advances in materials science to optimize bioremediation of contaminants in soil, sediment, or water. In each session, awardees will describe their research projects, accomplishments, and next steps. The second session will showcase novel tools and improved techniques to clean up sites contaminated with chlorinated compounds. For more information and to register, please visit <https://clu-in.org/live>.

ITRC Bioavailability of Contaminants in Soil: Considerations for Human Health Risk Assessment - May 3, 2022, 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>.

Restoring the Community Fabric - Planning Redevelopment of the US Finishing/Cone Mills Superfund Site - May 4, 2022, 1:00PM-3:00PM EDT (17:00-19:00 GMT).

The restoration and redevelopment of historic industrial sites to commercial and residential use can provide areawide benefits for communities and local governments. This webinar will highlight the ongoing redevelopment process at the US Finishing/Cone Mills Superfund site in Greenville, South Carolina. Speakers will share the framework for redeveloping the site and creative strategies for overcoming challenges associated with redevelopment. The webinar will discuss the careful coordination between multiple parties to plan the innovative mixed-use redevelopment. Speakers will share lessons learned and recommendations for successfully navigating the redevelopment process and eliciting community buy in. For more information and to register, please visit <https://clu-in.org/live>.

ITRC Integrated DNAPL Site Characterization - May 5, 2022, 1:00PM-3:15PM EDT (17:00-19:15 GMT)

The Integrated DNAPL Site Characterization Team has synthesized the knowledge about dense non-aqueous 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 <https://www.itrcweb.org> or <https://clu-in.org/live>.

Utilizing Innovative Materials Science Approaches to Enhance Bioremediation: Session III - Plant and Fungal-based Bioremediation - May 13, 2022, 1:00PM-3:00PM EDT (17:00-19:00 GMT).

The NIEHS Superfund Research Program (SRP) is hosting a Progress in Research webinar series to showcase new breakthroughs to advance sustainable solutions for hazardous substances in the environment. The three-part series will feature SRP individual research projects funded in 2020, who are incorporating new advances in materials science to optimize bioremediation of contaminants in soil, sediment, or water. In each session, awardees will describe their research projects, accomplishments, and next steps. The third and final session will focus on strategies to improve how plant and fungi remove hazardous substances from soil. For more information and to register, please visit <https://clu-in.org/live>.

> New Documents and Web Resources

Climate Adaptation Profiles: Port Hadlock - Site 10 North End Landfill. Executive

Order 14008, Tackling the Climate Crisis at Home and Abroad, requires federal agencies to develop climate action plans that describe their agency's climate vulnerabilities and their agency's steps to bolster adaptation to the impacts of climate change. EPA's 2021 Climate Adaptation Action Plan accordingly outlines actions being taken to integrate climate adaptation into EPA policies and programs, including those addressing contaminated sites. One action involves developing site-specific profiles that illustrate a range of processes and tools for evaluating site vulnerabilities to future climate scenarios and adapting to the projected scenarios, thereby assuring site cleanup remedies remain protective of human health and the environment. The first profile release in this series describes adaptation measures taken at the Port Hadlock - Site 10 North End Landfill, a Superfund site on Naval Magazine Indian Island, Washington. The remedy includes a capped landfill, a vegetated geogrid and a shoreline protection system that are vulnerable to potential erosion due to tidal action and storm surge from the bordering Olympic Peninsula inlet. Long-term maintenance of the vegetated geogrid and shoreline protection system was deemed preferable to more aggressive climate resilience measures that could negatively affect local shellfish harvests, including those of Native American tribes holding harvest treaty rights. To view or download, please visit

<https://www.epa.gov/superfund/climate-adaptation-profile-port-hadlock-site-10-north-end-landfill>

Green Remediation Best Management Practices: Integrating Renewable Energy (EPA 542-F-22-001) and Soil Vapor Extraction and Other Air-Driven Systems (EPA 542-F-22-002). In line with the renewed Agency emphasis on sustainability and climate change resilience and mitigation, the Superfund Program is proceeding to update the very popular green remediation (GR) best management practice (BMP) fact sheets for the most common remedies in the Superfund program. The goal of these fact sheets is to share technical information on best practices that build sustainability into contaminated site cleanup operations across the portfolio of remediation approaches. The updated GR fact sheet on integrating renewable energy describes and illustrates use of BMPs involving applications of a site's natural solar, wind or geothermal resources at a wide range of scales. It also addresses the need to assess and optimize energy usage of an existing or anticipated remediation system in advance of renewable energy planning and describes approaches to purchasing green power generated by other parties. The updated GR fact sheet on soil vapor extraction (SVE) and other air-driven systems outlines BMPs that can help minimize the environmental footprint of constructing, operating, maintaining and monitoring cleanup remedies involving SVE, air sparging or vapor intrusion mitigation technologies. Both fact sheet updates highlight synergies between green remediation and climate adaptation practices, where one action provides both greenhouse gas mitigation and climate resilience. To view or download, please visit

https://clu-in.org/greenremediation/docs/GR_fact_sheet_renewable_energy.pdf and
https://clu-in.org/greenremediation/docs/GR_fact_sheet_SVE_air-driven_systems.pdf

Superfund Research Program Brief 327: Leveraging Machine Learning to Predict Toxicity. NIEHS Superfund Research Program (SRP) grantees developed a new computational approach to predict how hazardous substances may affect health based on key changes in cells. Led by April Z. Gu, Ph.D., of the Northeastern University Puerto Rico Testsite for Exploring Contamination Threats (PROTECT) SRP Center, researchers used machine learning and advanced algorithms to link biological changes from high throughput cell studies with health outcomes observed in animal studies. To view the Brief, please visit https://tools.niehs.nih.gov/srp/researchbriefs/view.cfm?Brief_ID=327.

ITRC Strategies for Preventing and Managing Harmful Benthic Cyanobacterial Blooms (HCB-2). Cyanobacteria is a bacterial phylum (Stanier 1977[5236]), and cyanobacterial species are a common component of the microbial communities found in water or growing at the bottom of oceans, lakes, ponds, rivers, wetlands, and streams across the globe. Cyanobacteria are also found in many terrestrial

environments. The scope of this document is freshwater non-planktonic HCBs that are primarily attached or loosely associated with various surfaces and includes the movement and fate of these mats once they detach and disperse. This document is a companion to the ITRC's HCB-1 guidance document (ITRC 2021[5119]). For more information and to view the document, please visit <https://hcb-2.itrcweb.org/>.

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:

- Diver-Less Deployment System for In-Situ Sediment Samplers
- Biodegradation of CVOCS and 1,4-Dioxane Mixtures by Engineered Microbial Communities
- Applying Cometabolism for Treatment of Traditional and Emerging Contaminants at DOD Sites
- Field Testing a Passive Multisampler to Measure Dioxins/Furans and Other Contaminant Bioavailability in Aquatic Sediments - Phase II
- Assessing the Potential for Bias in PFAS Concentrations During Groundwater and Surface Water Sampling
- Combined Approach Sheds Light on Global Cancer Risk
- Lines Of Evidence and Best Practices to Assess the Effectiveness of PFAS Remediation Technologies
- AFFF PFAS Terrestrial Ecological Risk Model Tool User's Manual.

Brownfields Area Wide Planning Germany-U.S. Webinar Series Announced. The United States and Germany have a long-standing partnership to share best practices on brownfields remedial technologies and planning for their safe cleanup and redevelopment. Over the last several years, a mutual practice of "area wide planning" has evolved. This approach looks beyond an individual property to consider the impacts and benefits of redevelopment to the broader community, especially communities that are historically underserved and environmentally impacted. The DE-US.net webinar series will present five key topics which highlight why Area Wide Planning is central for the development of sustainable communities. View the recorded webinar on Sustainable Reuse and learn more at <https://www.de-us.net/webinar.html> .

EUGRIS Corner. New Documents on EUGRIS, the platform for European contaminated soil and water information. More than three resources, events, projects and news items were added to EUGRIS in March 2022. 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.

> Conferences and Symposia

2022 Environmental Measurement Symposium - Crystal City, VA, August 1-5, 2022. The Environmental Measurement Symposium (EMS) is the combined meeting of the National Environmental Measurement Conference (NEMC) and the Forum on Environmental Accreditation. The theme of the 2022 conference is Where Do We Go From Here? The Conference will include: a Technical Program featuring oral and poster presentations, a special half-day general session with a keynote speaker focused on the conference theme and updates from EPA program offices, special keynote presentations on the conference theme, and luncheon presentations; an Exhibit

Program showcasing the latest innovations in environmental monitoring; and an Innovative New Technology Showcase. For more information, please visit <https://www.envirosymposium.group/index.php>

2022 National Brownfields Training Conference - Oklahoma City, OK, August 16-19, 2022. 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 over 2,000 stakeholders in brownfields redevelopment and cleanup to share knowledge about sustainable reuse and celebrate the EPA brownfields program's success. Whether you're a newcomer or a seasoned professional, Brownfields 2021 offers something for you! For more information, please visit <https://brownfields2021.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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