U.S. ENVIRONMENTAL PROTECTION AGENCY

TechDirect, September 1, 2025

Welcome to TechDirect! Since the August 1 message, TechDirect gained 96 new subscribers for a total of 44,799. 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.

Due to technical upgrades, this edition will be distributed ahead of the typical scheduled date of September 1, 2025. We apologize for any inconvenience and aim to return to our regular delivery schedule next month.

> Upcoming Live Internet Seminars

ITRC: Pump & Treat Optimization Training - Thursday, September 4, 2025, 1:00PM-3:00PM EDT (17:00-19:00 GMT). This training aims to summarize existing information and best practices while also developing a systemic and adaptive optimization framework specifically for P&T well-network design and management. The primary audience for this training is environmental project decision-makers, which may include federal, state, tribal, and various local agency employees; contractors to these agencies; and potentially liable parties and their engineers and consultants as well as involved stakeholders. Generally, those involved in designing, building and operating, and optimizing pump & treat systems would benefit. The goal of the training is to provide a roadmap for optimizing a P&T system and refining the remedial strategy or shifting toward another remedial approach. Pump & Treat optimization should be systematic and data-based, and the training and document aim to provide tools and direction to assist in this rigorous process. For more information and to register, see https://www.itrcweb.org or https://www.clu-in.org/live.

ITRC Sediment Cap Chemical Isolation Training - Tuesday, September 9, 2025, 1:00PM-3:00PM EDT (17:00-19:00 GMT). In 2023, ITRC published the Sediment Cap Chemical Isolation Guidance to supplement the 2014 Contaminated Sediments Remediation Guidance with the goal of improving consistency in sediment cap performance outcomes. Sediment capping is a commonly selected remediation approach and numerous designs have been completed. Previous cap designs have been evaluated in multiple ways, and these varying approaches have led to some differences in selection of chemical design criteria, construction tolerance specifications, and monitoring/maintenance objectives for sites with similar

characteristics and contaminants, leading to different expectations for long-term performance and reliability. The Sediment Cap Chemical Isolation Training will cover several key elements of the recommended framework. For more information and to register, see https://www.itrcweb.org or https://www.clu-in.org/live.

RemPlex: An Overview of Chalk River Laboratories' Experience in Addressing Legacy Site Liability - Tuesday September 9, 2025, 11:00AM-12:30PM EDT (16:00-17:30 BST). The Chalk River Laboratories site, located in Chalk River, Ontario (Canada), includes several complex legacy landfills that present significant challenges for environmental characterization and remediation. Featuring presenters from Canadian Nuclear Laboratories, this seminar will offer a technical overview of current methodologies, lessons learned, and ongoing efforts to address environmental liability at legacy waste management areas within a regulated nuclear environment. Presented by the Center for the Remediation of Complex Sites (RemPlex). For more information and to register, see https://www.pnnl.gov/remplex-seminars.

ITRC: 1,4-Dioxane: Science, Characterization & Analysis, and Remediation Training - Tuesday, September 16, 2025, 1:00PM-3:15PM EDT (17:00-19:15 GMT). In 2020, ITRC's 1,4-Dioxane team created multiple tools and documents that provide information to assist all interested stakeholders in understanding this contaminant and for making informed, educated decisions. Since the 1950s, 1,4-Dioxane has seen widespread use as a solvent stabilizer. The use of solvents through the 1980s suggests its presence at thousands of solvent sites in the US; however, it is not always a standard compound in typical analytical suites for hazardous waste sites, so it previously was overlooked. The U.S. EPA has classified 1,4-Dioxane as "likely to be carcinogenic to humans." Some states have devised health standards or regulatory guidelines for drinking water and groundwater standards; these are often sub-part per billion values. These low standards present challenges for analysis, characterization, and remediation of 1,4-Dioxane. The 1,4-Dioxane: Science, Characterization & Analysis, and Remediation training is a series of six (6) modules. The six individual modules will be presented together live, and then archived on the ITRC 1,4-Dioxane training webpage for on demand listening. For more information and to register, see https://www.itrcweb.org or https://www.clu-in.org/live.

ITRC: Managed Aquifer Recharge (MAR) Training - Tuesday, September 23, 2025, 1:00PM-3:00PM EDT (17:00-19:00 GMT). This training is intended for state regulators and stakeholders who may not be familiar with the opportunities and challenges associated with MAR. It provides a basic understanding of MAR concepts, along with case studies, that showcase examples of successful MAR applications. For those who are familiar with MAR, the training gives an overview of the components of the MAR process along with the important considerations associated with each component necessary for the design and implementation of a MAR project. For more information and to register, see https://www.itrcweb.org or https://www.clu-in.org/live.

Virtual Technology Fair: Per- and Polyfluoroalkyl Substances (PFAS) - Wednesday, September 24, 2025, 1:00PM-2:30PM EDT (17:00-18:30 GMT). The NIEHS Superfund Research Program (SRP) presents a "Virtual Technology Fair" featuring Small Business Innovation Research (SBIR) grant recipients developing innovative solutions for per- and polyfluoroalkyl substances (PFAS). Speakers will give a "pitch", showcasing the work underway and its value-added to disrupt the market. We encourage participation by and questions from potential end-users, customers, and other stakeholders to accelerate technology transfer of these promising approaches. For more information and to register, see https://www.clu-in.org/live.

> New Documents and Web Resources

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 resource was included in recent issues:

- Bioremediation of Chlorinated Volatile Organic Compounds: DOE Experiences and Lessons Learned

Practical Groundwater Science Guides: Per- and Polyfluoroalkyl Substances (PFAS) (July 2025). This report provides easily digestible information for site assessment and remediation practitioners who work on PFAS-contaminated sites. Topics covered include PFAS evaluation of site-specific groundwater vulnerability from PFAS-impacted soil, groundwater sampling for PFAS, and ways that surface chemistry and surfactant properties of some PFAS may impact their transport and fate. The document compiles information from three technical briefs that were originally released internally by EPA. The intended audience includes geologists, hydrogeologists, risk assessors, RPMs, and others who work on PFAS-contaminated sites. Users should have a basic understanding of PFAS. The information provided in this document will also be of use to stakeholders such as state and federal regulators, Native American tribes, consultants, contractors, and other interested parties. View the report at https://www.clu-in.org/PFAS-GW-Science.

US EPA ORD (April 2025) Long-term Field Study of Nitrate and Ammonium Remediation Using a Permeable Reactive Barrier at a Livestock Feeding Operation. The research article highlights the importance of understanding groundwater geochemistry and hydrologic characteristics for selecting effective remediation technologies. It explores the chemical and microbiological processes involved in nitrate removal using carbon-based permeable reactive barriers (PRBs) and evaluates their impact on aquifer chemistry. The findings, relevant to global environmental efforts, emphasize the success of PRBs in nitrogen mitigation while cautioning about potential secondary contaminant mobilization, underscoring the need for careful application of organic carbon systems in groundwater remediation. View more at https://cfpub.epa.gov/si/si_public_record_report.cfm?dirEntryId=365182&Lab=CESER&simplesearch=0&showcriteria=2&sortby=pubDate&searchall=Permeable+Reactive+Barrier&timstype=&datebeginpublishedpresented=08/29/2023

NAVFAC (July 2025) Fact Sheet Effective Strategies for Incorporating Applicable or Relevant and Appropriate Requirements (ARARs). A NAVFAC Fact Sheet has recently been developed and is now available to support the identification, documentation, and implementation of Applicable or Relevant and Appropriate Requirements (ARARs) for Department of the Navy (DON) Environmental Restoration Program (ERP) sites. This Fact Sheet answers several frequently asked questions regarding ARARs and provides practical tips for implementation at DON ERP sites. View the fact sheet at https://www.clu-in.org/NAVFAC-ARARs.

ContaminatedLand.info. With a focus on sustainable and risk-based land management, this platform offers information on best practices, regulatory considerations, and innovative solutions for addressing contamination challenges. To view these resources, visit https://contaminatedland.info/.

> Conferences and Symposia

RemTech Europe 2025, September 15-19, 2025, Ferrara, Italy. RemTech Europe is an international conference on land and water remediation, environmental sustainability, and emerging technologies. The event will take place from September 15 to 19, 2025, with both in person and online participation options. Several short courses will be offered such as

- Soil Health and Emerging Contaminants
- Bioremediation for Challenging Environments
- In Situ Soil Remediation
- Mining Legacies: Assessment, Risk, and Recovery
- Biochar Applications in Soil Remediation
- E3358-23a - Standard Guide for Per- and Polyfluoroalkyl Substances Site Screening and Initial Characterization
- Groundwater Remediation
- In Situ Adsorption and Destruction Technologies for sustainable and effective In Situ Contaminated Sites Remediation

For more information and to register, please visit https://remtechexpo.com/remtech-europe/.

U.S EPA and Risk Assessment Information System (RAIS) Screening Level Calculator Training for Chemical and Radionuclide Risk Analysis, September 22-25, 2025, Oak Ridge, Tennessee. This training will primarily provide the participant with operational knowledge of key EPA and RAIS calculators. Additionally, the training and exercises will delve into the ability of the calculators to address site-specific exposures, unique toxicity assessments, and complex risk characterizations. Registration is open and spaces are limited for this popular class. In addition to classroom activities, tours are given of the Spallation Neutron Source facility, the High Flux Isotope Reactor, Frontier (ORNL's exascale supercomputer), and the Historic Graphite Reactor from the Manhattan Project. For more information, please visit https://rais.ornl.gov/home/fall2025.html

6th ENSOr Workshop: Managing Emerging Contaminants for healthy soils: Are we ready?!, October 13-14, 2025, Brussels, Belgium. EmConSoil, OVAM's multi-stakeholder network on emerging soil contaminants, is excited to announce the call for abstracts for its upcoming workshop which will center around the evolving issue of emerging contaminants in soil and groundwater. The goal is to share knowledge, foster dialogue, and explore innovative approaches.
For more information, please visit http://www.emconsoil.eu/.

Design and Construction Issues at Hazardous Waste Sites (DCHWS West), November 3-5, 2025, Denver, CO. The US EPA and Society of American Military Engineers (SAME) co-sponsor the DCHWS West which will be held in Denver, Colorado. The applications of engineering and science associated with cleaning up hazardous waste sites continue to evolve rapidly. The event's primary goal is to facilitate an interactive engagement between professionals from government and the private sector related to relevant and topical issues. For more information, please visit https://sites.google.com/samephiladelphiapost.org/dchws/west-symposium/fall-2025-dchws.

Global Summit on Environmental Remediation, November 4-6, 2025, Richland, WA. This international forum focuses on challenges, barriers, and innovative solutions for successful remediation and long-term stewardship of contaminated sites. The Global Summit is set for November 4-6, 2025, at Pacific Northwest National Laboratory

in Washington state. This event is organized in cooperation with the International Atomic Energy Agency's Network of Environmental Remediation and NORM Management (ENVIRONET). For more information, please visit https://www.pnnl.gov/projects/remplex/2025-summit.

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 (202) 566-0832 or balent.jean@epa.gov.

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