The call for paper submission has concluded. Thank you for your interest.

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EVALUATION OF THIN-LAYER PLACEMENT AND AMENDMENTS AT BERRY'S CREEK SUPERFUND SITE: FINDINGS FROM TREATABILITY STUDIES AND PILOT STUDIES

A series of laboratory and field experiments were conducted with a thin-layer study to (1) evaluate the effects of thin-layer placement of wood and without amendments to reduce contaminant (mercury, methyl mercury, PCB) bioavailability in the biologically active zone (BAZ), and (2) reduce uncertainty related to how the system will respond over time to thin-layer placement. The lab study focused on screening amendments mixed with site sediment slurries and measuring reactions of the amendments with the sediment-water interface, surficial sediment, converting water and surficial sediment samples from contaminated to clean conditions. The results demonstrated that thin-layer placement had no significant effects on the health status of the ecosystem, as demonstrated by core and survey results. Chemical data indicate that the thin-layer placements are achieving objectives with no observed effect on benthic community diversity and abundance.

PASSIVE BIOBARRIER FOR TREATING CO-MINGLED PERCHLORATE AND RDX IN GROUNDWATER AT A HIGHLY ACTIVE SOURCE: COST AND PERFORMANCE REPORT
Hatef, K., A. Stroup, and D. Linder. ESSTP Project EB-00216, 107 pp, 2016

Appendix A: The front cover of the Nevada Warfronters Center Fairbank-Division (NVFW) suggest that an emulsified oil bioreservoir is a viable alternative to reduce the migration of co-mingled perchlorate and explosives in groundwater at this site and similar range sites. The optimal areas for application of this technology include groundwater, munitions target ranges, EOD training areas, target areas, munitions disposal sites, and other areas where high concentrations of munitions constituents are likely to occur. Despite the overwhelming evidence for explosives and perchlorate efflux in the surficial sediment and groundwater, there has been little study of the chemical and biological processes that could attenuate contamination. The new approach is described in a 2017 paper by X. Su et al. in theAdvocate newsletter at https://water.usgs.gov/ogw/bgas/seer/ and in the CL:AIRE bulletin at http://railtec.illinois.edu/RREC/pdf/2016%20RREC/Presentations/12_Mohlenhoff.pdf

Research

FTI RESEARCHERS DEVELOP NEW ELECTROCHEMICAL METHOD TO CLEAR POLLUTANTS FROM WATER
Dyck, B. A., T. S. Young, B. J. Albers, and T. J. Heimes. May 2017

A novel development at MIT relies on an electrochemical process for selective removal of organic contaminants (e.g., pesticides, chemical waste products, pharmaceuticals) as the water flows between chemically treated or ‘functionalized’ surfaces that act as electroactive electrode pairs. The electroactive electrodes are coated with nanomaterials, which can undergo reactions to become positively or negatively charged. These active groups can be tuned to bind strongly with contaminant molecules. This selectivity makes it possible to simultaneously remove multiple contaminants from water. This is particularly promising for water treatment applications that require the removal of multiple contaminants or for removing contaminants present at trace levels.

A primary advantage of the new approach is that it can be applied to contaminants with a wide range of redox potentials. This is particularly promising for removing contaminants with low redox potentials, which can be challenging with traditional electrochemical methods. The non-reaction nature of the electrode pair also makes it possible to selectively operate the electrodes to remove different contaminants without interfering with the performance of the other electrodes. This can be particularly useful in applications where multiple contaminants need to be removed simultaneously.

The new approach is described in a 2017 paper by X. Su et al. in the Advocate newsletter at https://water.usgs.gov/ogw/bgas/seer/ and in the CL:AIRE bulletin at http://railtec.illinois.edu/RREC/pdf/2016%20RREC/Presentations/12_Mohlenhoff.pdf

The scenario evaluation for electrical sensitivity (SEES) survey design tool
Grundwasser (Published online prior to print May 2017)

Geophysical users are in water, environmental, and geophysical fields; however, techniques such as electric field imaging (EFI) are often overlooked or underutilized due to a lack of understanding of the techniques, such as the appropriate depth intervals or resolution of the methods. The relationship between ERI data and resistivity or non/nondetect; therefore, these limitations depend on site conditions and design and are best suited for large-scale surveys. The scenario evaluation for electrical sensitivity (SEES) was specifically developed for small-scale surveys and can take many hours to improve electrical sensitivity tool. The scenarios evaluator for the U.S. Forest Service’s Passive Bioaccumulation Assessment Technology (PBAT) bioaccumulation test.
ARSENIC REMOVAL FROM DRINKING WATER: EXPERIENCES WITH TECHNOLOGIES AND CONSTRAINTS IN PRACTICE
Hartman, B., M. Kram. 2016

POLYMER NETWORK CAPTURES DRINKING WATER CONTAMINANT: CROSS-LINKED CYCLODEXTRIN REMOVES 93% OF THE PERFLUORINATED CHEMICAL PFOA FROM WATER IN LAB TESTS
Lockwood, D. 2016

A mercury-resistant bacteria strain SE1 isolated from contaminated soil was identified as Pseudomonas putida based on 16S rRNA sequencing. Hg resistance was examined in nutrient-rich media as well as low-nutrient media and expressed as ECA and NOC values. Extended ECA and NOC values in nutrient-rich media and low-nutrient media had the following respective recordings: 23.8 µg/L, 21.1 µg/L, and 1.4 µg/L and 1.7 µg/L. The strains were able to volatilize trimphenyl mercury demonstrated by a modified photographic film experiment and subsequently revealed its ability to remove Hg from soil. The ICP-QQQ-MS analysis of SE1-inoculated soil showed almost 60% of 1.5 mg/L Hg was volatilized in 5 h and almost 90% accumulated in soil after 6 days. The mercury-resistant gene mer was identified in the genome of isolates SE1 and subsequent. The deduced amino acid sequence of mer indicated a sequence homology with different mercury-resistant bacteria. The isolate was cultured in serial dilutions of the culture broth and growth was observed in the presence of the metal gene and the mercury-resistant enzyme demonstrated the potential application of this strain in mercury remediation.

COBALT OXIDIZED AND UZALEE OXYGEN FOR THE REMOVAL OF 1,4-DIOXANE FROM DRINKING WATER

REMEDIATING 1,4-DIOXANE-CONTAMINATED WATER WITH SLOW-RELEASE PERSULFATE AND ZEROVALENT IRON

REMEDIATION OF MERCURY, PROBES, AND PHASE SEPARATION IN A SOIL SEDIMENT MIXTURE

REMEDYING 1,4-DIOXANE-CONTAMINATED WATER WITH SLOW-RELEASE PERSULFATE AND ZEROVALENT IRON

A novel adsorption process for the treatment of per- and polyfluorinated alkyl substances (PFASs) in wastewater from airport fire-training grounds

ASSESSMENT OF REPEATED HARVESTS ON MERCURY AND ARSENIC PHYTOEXTRACTION IN A MULTI-CONTAMINATED INDUSTRIAL SOIL
Ordóñez, D.N., M. Schobitz, C. García, S. Pérez, and E. Berrea. 2017

A mercury-resistant bacteria strain SE1 isolated from contaminated soil was identified as Pseudomonas putida based on 16S rRNA sequencing. Hg resistance was examined in nutrient-rich media as well as low-nutrient media and expressed as ECA and NOC values. Extended ECA and NOC values in nutrient-rich media and low-nutrient media had the following respective recordings: 23.8 µg/L, 21.1 µg/L, and 1.4 µg/L and 1.7 µg/L. The strains were able to volatilize trimphenyl mercury demonstrated by a modified photographic film experiment and subsequently revealed its ability to remove Hg from soil. The ICP-QQQ-MS analysis of SE1-inoculated soil showed almost 60% of 1.5 mg/L Hg was volatilized in 5 h and almost 90% accumulated in soil after 6 days. The mercury-resistant gene mer was identified in the genome of isolates SE1 and subsequent. The deduced amino acid sequence of mer indicated a sequence homology with different mercury-resistant bacteria. The isolate was cultured in serial dilutions of the culture broth and growth was observed in the presence of the metal gene and the mercury-resistant enzyme demonstrated the potential application of this strain in mercury remediation.
States have a variety of response programs, such as brownfields, voluntary cleanup, landfill cleanup, and underground storage tank programs, that can help communities redevelop problem properties. This update of the 2007 toolbox reflects new procedures, information, and resources in community redevelopment. It is designed to help communities locate resources to assist with revitalization efforts and redevelop brownfield properties by providing the basics needed to navigate the redevelopment process. 

MODELS AND LESSONS FOR DEVELOPING A CONTAMINATED SITE PROGRAM: AN INTERNATIONAL REVIEW

Environmental Technology & Innovation 7:77-86(2017)

This article contains a brief overview and highlights from two recent World Bank publications: the first deals with the development of a contaminated site program in low- and middle-income countries, and the second describes alternatives available for financing remediation and redevelopment of contaminated sites. The first report (1) provides a description of the various policy, legislative, regulatory, and implementation options for creating a cleanup program and suggests steps in developing a management plan. The second publication (2) reviews established and emerging financing mechanisms for contaminated site cleanup and outlines the strengths and challenges of each based on the experiences of several countries.


AUSTRALIAN GUIDANCE VALUES FOR ASSESSING EXPOSURE TO PERFLUOROOCTANE SULFONATE (PFOS) AND PERFLUOROOCTANOIC ACID (PFOA)

Australian Government, Department of Health, 2017
On 3 April 2017, the Australian Government released Perfluorinated Chemicals in Food, a review by Food Standards Australia New Zealand (FSANZ) that recommended tolerable daily intake (TDI) values for people potentially exposed to PFASs, including PFOS and PFOA. The TDI for PFOS is 20 ng/kg of body weight per day for adults and 200 ng/kg of body weight per day for children. The TDI for PFOA is 0.07 µg/kg of body weight per day. The drinking water quality value has been reduced from 0.5 to 0.07 µg/L for PFOS and from 5 to 0.06 µg/L for PFOA. More information, including the FSANZ report and several fact sheets, is available on the Australian Department of Health website.

NEW BROWNFIELD HEALTH INDICATOR TOOL

Minnesota Brownfields and the Minnesota Department of Health have developed a 20-page Brownfield Health Indicator Tool for community planners, landscape architects, developers, and community leaders. The tool incorporates a series of indicators that address community health factors and is designed to streamline the project decision-making process by providing a framework for stakeholders to identify and prioritize redevelopment goals. The tool is available in both PDF and Microsoft Excel at http://mnbrownfields.org/brownfield-health-indicator-tool/.

The Technology Innovation News Survey welcomes your comments and suggestions, as well as information about errors for correction. Please contact Michael Adam of the U.S. EPA Office of Superfund Remediation and Technology Innovation at adam.michael@epa.gov or (703) 603-9915 with any comments, suggestions, or corrections.

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