

Geo-EnvironMeet 2025

Geoenvironmental Contamination and Waste Containment

Selected Papers from Geo-EnvironMeet 2025

Geotechnical Special Publication Number 359

Louisville, Kentucky, USA
2-5 March 2025

Editors:

Arvin Farid
Kevin Foye
Milind V. Khire

ISBN: 979-8-3313-1514-6

Printed from e-media with permission by:

Curran Associates, Inc.
57 Morehouse Lane
Red Hook, NY 12571



Some format issues inherent in the e-media version may also appear in this print version.

Copyright© (2025) by American Society of Civil Engineers
All rights reserved.

Printed with permission by Curran Associates, Inc. (2025)

For permission requests, please contact American Society of Civil Engineers
at the address below.

American Society of Civil Engineers
1801 Alexander Bell Drive
Reston, VA 20191
USA

Phone: (800) 548-2723
Fax: (703) 295-6333

www.asce.org

Additional copies of this publication are available from:

Curran Associates, Inc.
57 Morehouse Lane
Red Hook, NY 12571 USA
Phone: 845-758-0400
Fax: 845-758-2633
Email: curran@proceedings.com
Web: www.proceedings.com

Contents

Geoenvironmental Contamination

Suitability of Ureolytic Microbe in Limiting Desiccation-Induced Volumetric Shrinkage Strain of Lateritic Soil for Waste Containment Purposes.....	1
Roland K. Etim, Kolawole J. Osinubi, Adrian O. Eberemu, and Thomas S. Ijimdiya	
Summary of 3 Years of Reclamation Activity at the South Dakota Mines Geotechnical Living Laboratory	12
Bret N. Lingwall and Heidi Sieverding	
Coupled PFAS Transport and Seepage Models to Evaluate Retardation due to Air–Water-Interface Adsorption.....	24
Md. Khorshed Alam and Arvin Farid	
Modeling the Mitigation Effect of a Horizontal Permeable Reactive Barrier on the Vapor in Point Source Contaminated Sites.....	34
Zhang-Wen Zhu and Shi-Jin Feng	
The Role of Coupled Flow Phenomena in the Performance Assessment of Bentonite-Based Contaminant Barriers	43
Andrea Dominijanni and Nicolò Guarena	
Impact of Idol Immersion on the Water Quality of the Hooghly River and Review on the Use of Nanomembrane for Water Treatment in a Cost-Effective Manner.....	53
Kaustav Das, Bishal Makal, Rahul Chakraborty, Kaushik Bandyopadhyay, and Partha Pratim Biswas	
Effect of Alternate Cementation Reagent and Soil Moisture on Leachability of Heavy Metals in Soil Remediated Using <i>Bacillus subtilis</i>	62
Kalyani Kulkarni, Nehal Jain, and G. L. Sivakumar Babu	
Phytoremedial Potential of <i>Cymbopogon citratus</i> in Bauxite Mines’ Overburden	71
Pratyasha Singh, Aparupa Pani, and Shivanand S. Shirkole	
Long-Term Settlement, Lateral Deformation, and Stress Behavior of a Soil–Bentonite Slurry Wall	79
Jeffrey C. Evans, Landon Barlow, Daniel Ruffing, and Nathan Coughenour	
Contaminant Removal by Chitosan–Bentonite, Chitosan–Biochar, and Chitosan–Bentonite–Biochar Composites	88
Banuchandra Nagaraja, Jagadeesh Kumar Janga, Saddam Hossain, Gaurav Verma, Angelica M. Palomino, and Krishna R. Reddy	

Breakthrough Curves of Perfluorooctane Sulfonate on Japanese Host Soils100
 Tomohiro Kato, Hiro Yoshimura, Atsushi Takai, Shuhei Tanaka, Wenjiao Li,
 and Takeshi Katsumi

**Leaching Behaviour of Geogenic Arsenic from Mudstones under Cyclic
 Wetting and Drying Conditions.....106**
 Lincoln W. Gathuka, Tomohiro Kato, Tang Jiajie, Atsushi Takai,
 and Takeshi Katsumi

**Efficacy Assessment of Vetiver (*Chrysopogon zizanioides*) for the
 Removal of Persistent Organic Pollutants Using Vertical Surface
 Flow Constructed Wetland System115**
 Avishek Adhikary, Supriya Pal, Sudipta Ghosh, Hirok Chaudhuri,
 Mrinal Kanti Mandal, and Rajib Ghosh Chaudhuri

Stabilization of Black Cotton Soil Using Red Mud and Gypsum.....126
 S. S. Kushwaha, D. Kishan, and S. K. Gupta

**Electrokinetic Remediation of Metal-Contaminated Soils: Influence of
 Operating Variables.....136**
 Sonam Taneja, Oznur Karaca, and A. K. Haritash

**Interactions of Viral Pathogenic Waste with Clays for Containment
 Applications143**
 Himanshu Yadav, T. V. Bharat, and Sachin Kumar

**Sorption of Perfluoroalkyl Substances on High-Density Polyethylene
 Geomembranes.....153**
 Aamir Ahmad, Kuo Tian, and Burak Tanyu

**Removal of the Diclofenac Present in Water Using *Bacillus subtilis*
 Biofilm Supported onto Activated Carbon Synthesized from
 Coconut Shell in a Batch System160**
 Chhaya Tiwari, Trishikhi Raychoudhury, and Ramakrishna Bag

**Assessing the Potential of Montmorillonite Clay Mineral for
 Containment of Pharmaceutical Waste Using Molecular
 Dynamics Simulation167**
 Sharad Dadhich and Tadikonda Venkata Bharat

Environmental Justice Considerations in Contaminated Site Remediation175
 Krishna R. Reddy and Gaurav Verma

**Practical and Risk-Based Management of Potential PFAS
 Contamination for Your Project186**
 Wendy A. Presler, Kristen Freiburger, and Stephen B. Ellingson

Physical Modelling of Voluminous Spill and Migration of LNAPL Contaminants in Unsaturated Soil	198
Ali Behdad and Majid Moradi	
Event-Based Response to Groundwater Contamination from Severe Surface Flooding	205
Theo Sarris, Magali Moreau, Stewart Cameron, Mike Taves, Andrew Pearson, Murray Close, and Simon Harper	
Challenges Associated with the Management of Landfilled Mined Residue: Treatment versus Containment	216
Mohit Somani, Manoj Datta, and G. V. Ramana	
Field Deformations of an Instrumented PVC Sheet Pile Wall	224
Milind V. Khire and Balu George	
<i>Waste Containment and Management</i>	
Probabilistic Characterization of Soil Water Storage of Different Landfill Covers from Field Investigation	235
Md. Jobair Bin Alam, Abdul M. Choudhury, and Maalvika Aggarwal	
Real-Time Management of Public Fill in Hong Kong Using Information and Communications Technology.....	246
Albert T. Yeung and P. L. Ng	
Influence of Municipal Solid Waste Composition on the Performance of Conventional and Bioreactor Landfills.....	256
Jagadeesh Kumar Janga, Girish Kumar, and Krishna R. Reddy	
Development of New Large-Scale Test Setup for Simulating Bio- and Biogeochemical-Based Covers for Landfill Gas Mitigation.....	269
Gaurav Verma, Jyoti K. Chetri, and Krishna R. Reddy	
Ecofriendly Control of Mine Tailings Dust	282
Sahand Motameni, Jamie Ekholm, and Lianyang Zhang	
Experimental Study for Temperature History Effects on Swelling Pressure, Free Swelling Ratio, and Methylene Blue Adsorption Volume of Bentonites	290
Kunlin Ruan, Hideo Komine, Hailong Wang, and Daichi Ito	
Estimation of Soil–Water Characteristic Curve of Ulexite-Added Sand–Bentonite Mixtures Using Evaporation Method	298
S. G. Alpaydin and Y. Yukselen-Aksoy	

Factors Affecting PFOA Impact from Landfills: Illustrating a Simplified Assessment Method.....	304
R. Kerry Rowe and Farah B. Barakat	
Use of Artificial Intelligence to Obtain a StratiGraphic Profile of Tailings Dams from CPTu Tests	315
Helena P. Nierwinski, Leandro A. Custodio, Amanda S. Barbosa, and Ricardo J. Pfitscher	
Reliability-Based Design Optimization of Mine Waste Slopes Using Monte Carlo Simulations	324
Abdul Waris Kenue and B. Munwar Basha	
Clay Amendment for pH Mitigation of Electric Arc Furnace Ladle Slag.....	335
Bilal Korkmaz, Asli Y. Dayioglu, Mustafa Hatipoglu, and Aykut Senol	
Assessing the Equivalency of the Florida Double Liner System and EPA Composite Liner for Coal Ash Landfills.....	346
Leslie Okine, Poyu Zhang, Tarek Abichou, and Jiannan Chen	
Evaluating Diffusion through Geosynthetic Clay Liners Using a Modified Dialysis-Leaching Test Method	356
Daniel Adeleke, Kristin M. Sample-Lord, and Jonathan F. Hubler	
Safeguarding Tailings Dams from Space Using L-Band SAR Soil Moisture Analysis.....	364
James Perry and Yonatan Rabinovitch	
Consequence-Based Selection of Design for a Seismic Event for Landfills—An Approach Based on Canadian Dam Association Guidelines	370
Alan (Yung-Chin) Chou	
Soil–Water Characteristics Curve Measurement Methods and Challenges of Mine Tailings: Application to Tailings Management	379
Farzad Daliri	
Study of Mechanical Improvement of Hydrogel-Treated Construction and Demolition Fines.....	388
Beatrice Magombana, Shihui Liu, and Lin Li	
Role of On-Site Disposal in Sustainable Remediation	397
Kevin Foye	
Hydration Characteristics of Bentonite Core of Geosynthetic Clay Liner: Key Role of Wet–Dry Cycles and Hydrating Fluids.....	406
Vishwajeet Khan and Rajesh Sathiyamoorthy	

**Hydraulic Conductivity and Chemical Compatibility of Trichy Clay for
Municipal Solid Waste Landfill Liner Applications.....418**
R. Shanmuga Priya and T. Thyagaraj

**Evaluation of Mineral–Bentonite Mixtures to Concurrently Achieve Low
Hydraulic Conductivity and High Strength431**
S. Jacob, J. Scalia IV, and C. Bareither

**Comparison of Dynamic Properties between Treated and Untreated
Bauxite Residue.....441**
Jose Maria Fuentes, Wing Shun Kwan, Cesar Leal, and Elizabeth Nunez