

# Battelle's 2024 International Conference on Remediation of Chlorinated and Recalcitrant Compounds

## Featured Short Course

Sunday, June 2, 2024

### Short Course - Room 6 (406)

**8:00 AM – 12:00 PM**  
Best Practices for Applying In Situ Chemical Oxidation (ISCO): Over Two Decades of Successful Applications, Lessons Learned and Evolution  
**Instructors: Brant Smith (Evonik), Josephine Molin (Evonik), Leah MacKinnon (Geosyntec Consultants), Chapman Ross (FRx, Inc)**

## Featured Platform Presentations

Monday, June 3, 2024

### Session – A2. Challenges and Lessons Learned in Remediating Sites with Complex Geology *Mile High Ballroom, Rooms 1e/1f*

**3:05 PM – 3:30 PM**  
Remediation of DNAPL in Competent Mudstone: Challenges and Importance of Post Monitoring to Evaluate Performance  
*F. Lakhwala, E. Magdar, D. Macaulay*  
**Ravi Srirangam, Ramboll**

### Session – B1. Remedial Design/Optimization: Applications of Mass Flux to Surface Water and Sediments *Mile High Ballroom, Room 2c*

**12:35 PM – 1:00 PM**  
Targeted Remedy Implementation to Reduce Contaminant Flux to Surface Water and Sediments  
*K. Radar*  
**Joseph Nemesh, Tetra Tech**

### Session – G1. Innovations in ZVI Amendment Formulations and Applications *Mile High Ballroom, Room 3c*

**12:10 PM – 12:35 PM**  
An Innovative Approach to In Situ Soil Mixing Applied at a Chlorinated Solvent-Impacted Site in Batavia, New York  
*S. Dore, D. Vanetti, D. MacDougall*  
**Margaret Popek, GHD**

Tuesday, June 4, 2024

### Session – B3. Remedy Implementation: Assessing Performance and Costs

*Mile High Ballroom, Room 2c*

8:50 AM – Fast Kinetics In Situ Chemical Oxidation Treatment of a PCE Source Area with Sodium  
9:15 AM Persulfate Activated with Hydrogen Peroxide

*E. Bays, Z. Pinkowski*

**Angel A. Cuellar, Tetra Tech**

12:10 PM – Trialing Three Parallel Remediation Options to Select One Strategy for the Entire Site  
12:35 PM *H. Noord, J. Shore, J. Molin, M. af Petersens, J. Ryden,*

**Jonny Bergman, Sheeba Environmental Engineering AB**

### Session – C3. Adaptive Site Management: Lessons Learned for Site Characterization and Remedy Implementation

*Mile High Ballroom, Room 2b*

8:25 AM – Optimizing the Remedial Approach to Accelerate the Remediation Timeline while  
8:50 AM Managing Client Expectations: Remediating a Complex Former Manufacturing Site

*A. Kokorsky, J. Wood, F. Lakhwala, R. Srirangam*

**Zackary Smith, Verdantas**

### Session – G3. In Situ Chemical Oxidation: Optimized Design Approaches and Lessons Learned

*Mile High Ballroom, Room 3c*

8:50 AM – Solar Thermal Activation of Persulfate for ISCO Source Zone Treatment at Former  
9:15 AM Industrial Site

*R. Engelhardt, P. Jacobs, P. Aquino, J. Overgard*

**Tim Schöne, TAUW GmbH**

10:05 AM – Case Study: Using Recirculation Injection Methodology to Improve Efficacy of In Situ  
10:30 AM Chemical Oxidation Remediation

*J. Ferguson, I. Pelz, A. Chemburkar, J. Molin*

**Kyle Malley, ERM**

12:35 PM – Challenges When Remediation Timeline is Driven by Construction: A Phased Approach to  
1:00 PM Address Commingled Contamination in Vadose and Saturated Zones

*C. Spilatro, R. Srirangam, F. Lakhwala*

**John Bracken, Verdantas**

1:00 PM – ISCO Application for the Treatment of MCB, BTEX and CF in Groundwater at a  
1:25 PM Pharmaceutical Site

*B. Smith, M. Mueller*

**Alberto Leombruni, Evonik**

1:25 PM – Using “Stacked Fractures” to Increase Oxidant Loading to Subsurface for VOC and 1,4-  
1:50 PM Dioxane Treatment

*D. Baird, C. Ross, B. Smith, J. Bamer, J. Molin, S. Cwick, P. Stoick, S. Teschner*

**Michael Lamar, CDM Smith**

Wednesday, June 5, 2024

**Session – C5. DNAPL Source Zone Remediation: Lessons**

*Mile High Ballroom, Room 2b*

9:15 AM – Lessons from DNAPL Remediation in Bedrock by Chemical Oxidation: Concentrations  
Had to Go Up to Come Down  
9:40 AM *P. Kakarla*

**Paul Dombrowski, ISOTEC Remediation Technologies**

**Session – F4. High-Resolution Site Characterization (HRSC)**

*Mile High Ballroom, Room 3b*

10:30 AM – High-Resolution Design Optimization (HRDO) and Injection at Brookley AFB Mobile,  
Alabama  
10:55 AM *J. Bauman, M. Gerber, B. Carlson*

**Eliot Cooper, Cascade Environmental, LLC**

**Session – H4. Abiotic and In Situ Biogeochemical Processes: Applications and Lessons Learned**

*Mile High Ballroom, Room 4d-4f*

10:30 AM – Application of a Combined Technology for the Treatment of Aerobic Aquifer Impacted with  
Carbon Tetrachloride and Chloroform  
10:55 AM *D. Leigh*

**Alberto Leombruni, Evonik**

Thursday, June 6, 2024

**Session – A12. Precipitation and Stabilization of Metals**

*Mile High Ballroom, Rooms 1e/1f*

2:15 PM – Optimization of a Combined Active and Passive In Situ Stabilization Approach for High  
Concentration Metals in Groundwater  
2:40 PM *R. Ansari, N. Hastings*

**Lucas Hellerich, Woodard & Curran, Inc.**

**Session – C8. GSR Best Practices and Nature-Based Remediation Case Studies**

*Mile High Ballroom, Room 2b*

8:00 AM – Sustainable In Situ Remediation with Targeted Solids Emplacement for Expedited  
Brownfield Redevelopment: A German Case Study  
8:25 AM *M. Herbst, M. Zittwitz, G. Bures, S. Huettmann, M. Mueller*

**Peter Martus, AECOM**

8:50 AM – Identifying Green and Sustainable Remediation Potentials: Case Study from a Complex  
Former Industrial Site in Brazil  
9:15 AM *R. Engelhardt, P. Jacobs, P. Aquino, J. Overgard*

**Tim Schöne, TAUW GmbH**

**Session – D8. Surfactant-Enhanced Remediation**

*Mile High Ballroom, Room 2a*

9:15 AM – Full-Scale Application of ISCO and S-ISCO® for Treatment of NAPL Pharmaceutical Waste Mixture

9:40 AM *L. MacKinnon, N. Durant, T. Jørgensen, B. Gerdmundsson, J. Sørensen, K. Bundgaard Mortensen, J. Christensen*

**Felipe Solano, Geosyntec Consultants**

**Session – G7. Combined Remedies and Treatment Train Technologies**

*Mile High Ballroom, Room 3c*

9:15 AM – Full Scale Application of ERD following ISCO/S-ISCO® for Treatment of NAPL Pharmaceutical Waste Mixture

9:40 AM *F. Solano, N. Durant, T. Jørgensen, B. Gerdmundsson, J. Sørensen, K. Bundgaard Mortensen, J. Christensen*

**Leah MacKinnon, Geosyntec Consultants**

**Session – G8. Combined Remedies and Treatment Train Technologies for Chlorinated Contamination**

*Mile High Ballroom, Room 3c*

1:25 PM – Combined Remedy for Rapid Redevelopment of Multi-Acre TCE and 1,4-Dioxane Plumes  
1:50 PM *P. Dombrowski, M. Temple, J. Kazanjian, P. Downham, R. Chimchirian*

**Prasad Kakarla, ISOTEC Remediation Technologies**

## Featured Poster Presentations

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### Group 1 Posters

Display: Sunday 5:30 PM – Tuesday 1:00 PM

Presentations: Monday 4:30 PM – 6:30 PM

#### Session – A2. Challenges and Lessons Learned in Remediating Sites with Complex Geology

- Poster #10** Caught between a Rock and a Hard Place: A Pilot Test to Address Chlorinated Solvent Impacts in Fractured Bedrock in Ohio  
*D. Zbieszkowski, T. Dewitt, B. Lewis*  
**Erik Cunningham, August Mack Environmental, Inc.**

#### Session – B3. Remedy Implementation: Assessing Performance and Costs

- Poster #43** 11-Year Performance Monitoring of Enhanced Reductive Dechlorination within Fractured Bedrock at a Densely Instrumented Site  
*D. Granger, M. Forman, C. Tate, G. Phillips*  
**David Dyson, AECOM**

#### Session – C5. DNAPL Source Zone Remediation: Lessons Learned

- Poster #98** TCE Removal from MGP DNAPL via Enhanced In Situ Bioremediation of Groundwater  
*C. Savoie, M Murray*  
**Christian Sifford, Maul Foster Alongi**

#### Session – G1. Innovations in ZVI Amendment Formulations and Applications

- Poster #223** Remedial Approach for In Situ Treatment of Deep CHC Contaminants Underlying a Manufacturing Site in Germany Using ZVI and Bioaugmentation  
*G. Bures, L. Erpel, M. Zittwitz, J. Feldges, W. Lenz*  
**Michael Mueller, Evonik**

#### Session – G3. In Situ Chemical Oxidation: Optimized Design Approaches and Lessons Learned

- Poster #241** An Adaptive Approach to Implementing an ISCO Soil Mixing Project at a Former Oil Depot in Sweden  
*M. Eriksson, J.Moreskog, M.Edvardsson, H. Ekman*  
**Josephine Molin, Evonik**

## Group 2 Posters

Display: Wednesday 7:00 AM – Thursday 1:00 PM

Presentations: Wednesday 4:30 PM – 6:30 PM

### Session – A10. Managing Chromium-Contaminated Sites

**Poster #4** Innovative Treatment of Hexavalent Chromium in Alkaline Industrial Waste  
*A. Seech, Y. Kunukcu, M Rabah, J. Midwig, D. Macaulay*  
**Ravi Srirangam, Ramboll**

### Session – A12. Precipitation and Stabilization of Metals

**Poster #16** Aligning Site Remediation for Arsenic with Site Development Needs  
*X. Yin, N. Palumbo, S. Day, S. Abrams*  
**Amita Oka, Langan Engineering**

### Session – G4. Bioremediation: Advances in Amendment Formulations

**Poster #150** Groundwater Remedy Transition from Enhanced In Situ Biotreatment to Long-Term Monitoring following TCE Source Removal in Fractured Sedimentary Bedrock and Overburden: Lessons Learned  
*T. Chaturgan, P. Thorn, J. Hickey, P. Randazzo*  
**Karnam Ramanand, Brown and Caldwell**

### Session – G8. Combined Remedies and Treatment Train Technologies for Chlorinated Contamination

**Poster #181** ISCO-ISS for Remediation of TCE Source Area: Achieving Cleanup Goals within One Week of Application  
*P. Wetterholm*  
**Josephine Molin, Evonik**

### Session – H4. Abiotic and In Situ Biogeochemical Processes: Applications and Lessons Learned

**Poster #190** Biogeochemically Enhanced In Situ Treatment of Chlorinated Organics and Metals  
*A. Seech*  
**Daniel Leigh, Evonik**

**Poster #195** Microbiological Processes in Biogeochemical Remediation  
*F. Lakhwala, D. Leigh*  
**Alan Seech, Evonik**

**Poster #191** In Situ Biological and Chemical Reduction of Chlorinated Compounds in a Complex Setting  
*P. Appel*  
**Beth Liu, EA Engineering, Science, and Technology, Inc.**

### Session – H7. Permeable Reactive Barriers: Best Practices and Lessons Learned

**Poster #214** A Site-Specific Solution for In Situ Treatment of Heavy Metals and Chlorinated Solvents in Groundwater at a Brownfields Redevelopment Site  
*R. Srirangam, J. Stapleton, N. Frasca*  
**Fayaz Lakhwala, Evonik**



