Welcome to ITRC’s 2010 Fall Meeting here in beautiful St. Louis, Missouri! As ITRC Board of Advisors Co-Chairs, we are excited to see that over 250 environmental professionals from across the country have joined us to collaborate on innovative approaches to solving environmental challenges. As a collective community, we have been opening doors for new technologies and approaches across many environmental areas since 1995. This year, ITRC celebrates 15 Years Advancing Environmental Solutions. It is remarkable to see our progress since 1995 and exciting to envision our achievements to come!

We hope you will take advantage of the many exciting sessions during this meeting by:

- Gaining insight from leading environmental experts who will share their state’s experiences with the Deepwater Horizon Oil Spill;
- Exploring new solutions as a panel of leaders present technical state-of-the-art techniques to help solve current environmental challenges;
- Observing an ITRC Team in action and participating in their technical discussions;
- Learning what’s on ITRC’s agenda for 2011.

We encourage each of you to use this meeting as an opportunity to expand your own network by interacting with professionals that have similar AND different views than yourselves, since “Advancing Environmental Solutions” requires embracing all perspectives to formulate guidance that is balanced, implementable and understandable across all sectors of the environmental community. That interaction has been the foundation of our first 15 years of success!

Thank you and have a great meeting,

Christine Costopoulos and George Nicholas

Please stay tuned to www.itrcweb.org for more ITRC Meeting Opportunities in 2011:

2011 Spring ITRC Membership Meeting – April 4-8 in Minneapolis, Minnesota
2011 Fall Meeting – October 24-28 in Denver, Colorado

We look forward to seeing you all again in 2011!
<table>
<thead>
<tr>
<th>Evaluation, Cont.</th>
<th>Yes</th>
<th>No</th>
<th>Somewhat</th>
<th>Comments</th>
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<tbody>
<tr>
<td>The technical panel during the Plenary Session was informative and interesting?</td>
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<tr>
<td>Your Project Team Meeting was effective?</td>
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<tr>
<td>The Mining Waste Implementation Session provided you enough information to encourage use of this document in your states/organizations?</td>
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</tbody>
</table>

What other suggestions do you have for future ITRC Fall Meetings?

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**Evaluation Form**

**Affiliation**

- Federal
- Team Leader/Member—Which Team(s)? __________
- IAP
- Board of Advisors
- State POC
- Other __________________

**EVALUATION**

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<tr>
<td>Please rate Ritz-Carlton facility, meeting space, etc</td>
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<thead>
<tr>
<th></th>
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<th>No</th>
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<tbody>
<tr>
<td>The evening reception provided a good atmosphere for networking?</td>
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<tr>
<td>The overall Plenary Session was an effective use of time?</td>
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<tr>
<td>The Keynote Speeches on the Deepwater Horizon Oil Spill were relevant and interesting?</td>
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<tr>
<td>The ITRC Co-Chair presentation was informative?</td>
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**Agenda**

**MONDAY, OCTOBER 25, 2010**

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<thead>
<tr>
<th>Time</th>
<th>Event</th>
<th>Room Assignment</th>
</tr>
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<tbody>
<tr>
<td>7:00 AM – 5:00 PM</td>
<td>Registration</td>
<td>Ballroom Foyer</td>
</tr>
<tr>
<td>7:00 AM – 8:30 AM</td>
<td>Breakfast</td>
<td>Salon I</td>
</tr>
<tr>
<td>8:00 AM – 5:30 PM</td>
<td>LNAFL Classroom Training Dry Run (Invitation Only)</td>
<td>Salon II</td>
</tr>
<tr>
<td>8:30 AM – 5:00 PM</td>
<td>Project Team Meetings</td>
<td>Colonnade</td>
</tr>
<tr>
<td></td>
<td>• Attenuation Processes for Metals &amp; Radionuclides</td>
<td>Consulate</td>
</tr>
<tr>
<td></td>
<td>• Contaminated Sediments</td>
<td>Monarch</td>
</tr>
<tr>
<td></td>
<td>• Environmental Impacts of Ethanol &amp; Bio-Based Fuels</td>
<td>Plaza Room</td>
</tr>
<tr>
<td></td>
<td>• Environmental Molecular Diagnostics</td>
<td>Pavilion</td>
</tr>
<tr>
<td></td>
<td>• Green &amp; Sustainable Remediation</td>
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</tr>
<tr>
<td>10:00 AM – 10:30 AM</td>
<td>AM Break</td>
<td>Salon I</td>
</tr>
<tr>
<td>12:30 PM – 1:30 PM</td>
<td>Lunch on Your Own</td>
<td>Salon I</td>
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<td>2:30 PM – 3:00 PM</td>
<td>PM Break</td>
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**TUESDAY, OCTOBER 26, 2010**

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<tr>
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<td>Breakfast &amp; Exhibits</td>
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<td></td>
<td>• Contaminated Sediments</td>
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<td>• Environmental Molecular Diagnostics</td>
<td>Pavilion</td>
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<td></td>
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# Agenda

**Tuesday, October 26, 2010, Cont.**

<table>
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<td>10:00 AM – 10:30 AM</td>
<td>AM Break</td>
<td>Salon I</td>
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<tr>
<td>12:30 PM – 1:30 PM</td>
<td>Lunch on Your Own</td>
<td>Salon I</td>
</tr>
<tr>
<td>2:30 PM – 3:00 PM</td>
<td>PM Break</td>
<td>Salon I</td>
</tr>
<tr>
<td>5:30 PM – 7:00 PM</td>
<td>Reception &amp; 15 Year Anniversary Celebration</td>
<td>Salon I</td>
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</table>

Performances by: James Taylor, George Nicholas, Kirby Biggs, Kelly Black, and Michael Stroh

**Wednesday, October 27, 2010**

<table>
<thead>
<tr>
<th>Time</th>
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<td>Breakfast &amp; Exhibits</td>
<td>Salon I</td>
</tr>
<tr>
<td>7:00 AM – 8:30 AM</td>
<td>POC Breakfast Meeting</td>
<td>Ambassador</td>
</tr>
<tr>
<td>8:30 AM – 5:00 PM</td>
<td>Plenary Session</td>
<td>Salon II</td>
</tr>
<tr>
<td>8:30 AM – 9:00 AM</td>
<td>Opening Remarks – Leanne Tippett Mosby, Director, Missouri Division of Environmental Quality</td>
<td></td>
</tr>
<tr>
<td>9:00 AM – 9:30 AM</td>
<td>Celebrating 15 Years of Advancing Environmental Solutions - Christine Costopoulous, New York &amp; George Nicholas, New Jersey, ITRC Co-Chairs</td>
<td></td>
</tr>
<tr>
<td>9:30 AM – 10:00 AM</td>
<td>AM Break &amp; Exhibits</td>
<td>Salon I</td>
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<tr>
<td>10:00 AM – 11:30 AM</td>
<td>Keynote Speakers Session – Moderator, Larry Bryant, Alabama</td>
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<td></td>
<td>Deepwater Horizon: Responding to an Oil Spill of Ridente</td>
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<tr>
<td></td>
<td>Chris M. Piehler – Water Quality Assessment Division Administrator, Louisiana Department of Environmental Quality</td>
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<tr>
<td></td>
<td>Yvonne Najah Addassi – Senior Environmental Scientist, California Department of Fish and Game, Office of Oil Spill Prevention</td>
<td></td>
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<tr>
<td>11:30 AM – 12:00 PM</td>
<td>ITRC 2011 Co-Chair Election - Nominee Speeches and Membership Voting</td>
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</table>

# St. Louis Local Information

**Restaurants within 0.5 Miles of the Ritz-Carlton**

- **Bici Café** – Mediterranean
  - 7401 Pershing Ave – 314.721.8484
- **Lampert’s Plush Pig Barbeque** – Barbeque
  - 7814 Forsyth Blvd – 314.725.4411
- **Blue Elephant** – Thai and Asian
  - 7816 Forsyth Blvd – 314.862.0500
- **Remy’s Kitchen & Wine Bar** – Mediterranean/Greek
  - 222 S Bemiston Ave – 314.726.5757
- **Crossing** – French, Italian and American
  - 7823 Forsyth Blvd – 314.721.7375
- **Morton’s of Chicago** – Steakhouse/Seafood
  - 7822 Bonhomme Ave – 314.725.4008
- **Café Manhattan** – Italian and Southern/Soul
  - 505 S Hanley Rd – 314.863.5695
- **Wasabi** – Japanese, Sushi and Asian
  - 16 S Central Ave – 314.721.9970
- **Pasto Plus** – Pizza and Italian – 22 S Central Ave – 314.727.1001
- **Clayton’s Diner** – Modern American
  - 6 S Central Ave – 314.721.8837
- **Jennifer’s Pharmacy & Soda Shoppe** – Ice Cream/Diner
  - 30 N Central Ave – 314.862.7400
- **Barcelona Tapas** – Spanish and Tapas
  - 34 N Central Ave – 314.863.9909
- **Pomme** – American – 40 N Central Ave – 314.727.4141

**Attraction**

- **St. Louis Arch** – 877.982.1410 – Ride the MetroLink to the Gateway Arch Riverfront – Tours last 1 hour, and begin every ten minutes (9:20am – 5:10pm)

**Pharmacy**

- **Walgreen’s** – Open 24 Hours – 6733 Clayton Rd – 314.721.6013
## 2010 Standard Members

<table>
<thead>
<tr>
<th>Company Name</th>
<th>Sponsorship</th>
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<tbody>
<tr>
<td>AC/CENT Environmental Services, Inc.</td>
<td>Golder Associates</td>
</tr>
<tr>
<td>AECOM Environment</td>
<td>Groundswell Technologies, Inc.</td>
</tr>
<tr>
<td>Agriculture &amp; Priority Pollutants Laboratory, Inc.</td>
<td>GSI Environmental Inc.</td>
</tr>
<tr>
<td>AMEC Earth and Environmental Aquifer Solutions, Inc.</td>
<td>H2A Environmental Ltd.</td>
</tr>
<tr>
<td>Battelle</td>
<td>Haley &amp; Aldrich, Inc.</td>
</tr>
<tr>
<td>BB&amp;E Beacon Environmental Services, Inc.</td>
<td>Honeywell International Inc.</td>
</tr>
<tr>
<td>Brown and Caldwell</td>
<td>JRW Bioremediation, LLC</td>
</tr>
<tr>
<td>Brownfield Associates, Inc.</td>
<td>Kleinfelder Inc.</td>
</tr>
<tr>
<td>Burns &amp; McDonnell Engineering Company, Inc.</td>
<td>Langan Engineering &amp; Environmental Services</td>
</tr>
<tr>
<td>CDM (Camp, Dresser, &amp; McKee, Inc.)</td>
<td>LATAGEMRON Remediation, LLC</td>
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<tr>
<td>CETCO</td>
<td>Malcolm Pirnie, Inc.</td>
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<tr>
<td>CH2M HILL</td>
<td>Microbial Insights, Inc.</td>
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<tr>
<td>Conestoga-Rovers &amp; Associates</td>
<td>Microseeps, Inc.</td>
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<tr>
<td>Cox-Colvin &amp; Associates, Inc.</td>
<td>Moriarty Environmental Solutions, Inc.</td>
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<tr>
<td>Dajak Directional Technologies, Inc.</td>
<td>MWH</td>
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<td>Dunklee &amp; Dunham</td>
<td>Neptune and Company, Inc.</td>
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<tr>
<td>DuPont Engineering and Land Planning Associates, Inc.</td>
<td>Patriot Environmental Management, LLC</td>
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<tr>
<td>EnvirosMetal Technologies, Inc.— an Adventus Company</td>
<td>Pollution Engineering Magazine</td>
</tr>
<tr>
<td>ENVIRON Environmental Planning Specialists, Inc.</td>
<td>Porewater Solutions</td>
</tr>
<tr>
<td>Fishbeck, Thompson, Carr &amp; Huber, Inc.</td>
<td>REGENESIS</td>
</tr>
<tr>
<td>Geosyntec Consultants</td>
<td>S.S. Papadopulos &amp; Associates</td>
</tr>
<tr>
<td>IAP Members</td>
<td>Scott Environmental Services, Inc.</td>
</tr>
<tr>
<td>IAP is proud to introduce IAP’s 2010 membership roster of Standard Members</td>
<td>Shaw Environmental &amp; Infrastructure, Inc.</td>
</tr>
<tr>
<td></td>
<td>T.H. Wiedemeier &amp; Associates, LLC</td>
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<td></td>
<td>TestAmerica Inc.</td>
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<td>Triad Environmental Solutions, Inc.</td>
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<td>URS Corporation</td>
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<td>Weston Solutions, Inc.</td>
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## Agenda

### Wednesday, October 27, 2010, Cont.

<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
<th>Room Assignment</th>
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<tbody>
<tr>
<td>12:00 PM – 1:30 PM</td>
<td>Lunch on Your Own</td>
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<tr>
<td>12:00 PM – 1:30 PM</td>
<td>Plenary Speakers’ Lunch</td>
<td>The Restaurant (Lobby Level)</td>
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<tr>
<td>12:00 PM – 1:30 PM</td>
<td>Stakeholder Member Lunch Meeting</td>
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<tr>
<td>12:00 PM – 1:30 PM</td>
<td>IAP Member Lunch Meeting</td>
<td>Ambassador</td>
</tr>
<tr>
<td>12:00 PM – 4:00 PM</td>
<td>LNAPL Classroom Training Debrief Meeting (LNAPL Instructors Only)</td>
<td>Colonnade</td>
</tr>
<tr>
<td>1:30 PM – 3:00 PM</td>
<td>Technical Panel – Moderator, Anna Willett, ITRC Director</td>
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<tr>
<td></td>
<td>State of the Art of Bioavailability in Contaminated Sediments – Stephen C. Geiger, Ph.D., CPSS; AECOM Environment &amp; ITRC Contaminated Sediments Team Member</td>
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<tr>
<td></td>
<td>State of the Art of Incremental Sampling Methodology Science and Application – Earl Crapps; Alaska Department of Environmental Conservation &amp; ITRC Incremental Sampling Methodology Team Member</td>
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<tr>
<td></td>
<td>Use of Mass Discharge/Mass Flux at Contaminated Sites – Charles J. Newell, Ph.D., P.E.; GSI Environmental Inc. &amp; ITRC Integrated DNAPL Site Strategy Team Member</td>
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<tr>
<td>3:00 PM – 3:30 PM</td>
<td>PM Break &amp; Exhibits</td>
<td>Salon I</td>
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<tr>
<td>3:30 PM – 4:30 PM</td>
<td>Mining Waste Implementation Session</td>
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<td>4:30 PM – 5:00 PM</td>
<td>ITRC Awards Ceremony and Results of 2011 ITRC Co-Chair Election</td>
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### Thursday, October 28, 2010

<table>
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<tr>
<th>Time</th>
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</tr>
<tr>
<td>8:30 AM – 5:00 PM</td>
<td>Board of Advisors Meeting (Board of Advisors Members Only)</td>
<td>Pavilion</td>
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## Agenda

### Thursday, October 28, 2010, Cont.

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<tr>
<th>Time</th>
<th>Event</th>
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<tr>
<td>8:30 AM – 5:00 PM</td>
<td>Munitions Restoration Workshop</td>
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<td>8:30 AM – 5:00 PM</td>
<td>Project Team Meetings</td>
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<tr>
<td></td>
<td>• Incremental Sampling Methodology</td>
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<td></td>
<td>• Solidification/Stabilization</td>
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<tr>
<td></td>
<td>(formerly known as ISS Team)</td>
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<tr>
<td></td>
<td>• Integrated DNAPL Site Strategy</td>
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<td></td>
<td>• Mining Waste</td>
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<td></td>
<td>• Permeable Reactive Barriers: Technology Update</td>
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<tr>
<td>10:00 AM – 10:30 AM</td>
<td>AM Break</td>
<td>Salon I</td>
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### Friday, October 29, 2010

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<tr>
<td></td>
<td>• Integrated DNAPL Site Strategy</td>
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<td></td>
<td>• Mining Waste (ending at 12:00 PM)</td>
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<tr>
<td></td>
<td>• Permeable Reactive Barriers: Technology Update</td>
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<tr>
<td>10:00 AM – 10:30 AM</td>
<td>AM Break</td>
<td>2nd Floor</td>
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<tr>
<td>12:30 PM – 1:30 PM</td>
<td>Lunch on Your Own</td>
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<tr>
<td>2:30 PM – 3:00 PM</td>
<td>PM Break</td>
<td>2nd Floor</td>
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</table>
**Exhibitors**

**TETRA TECH NUS, INC.**

Tetra Tech is a leading provider of consulting, engineering, and technical services. Tetra Tech currently has approximately 7,500 employees located in more than 250 offices worldwide.

**www.tetratech.com**

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**U.S. EPA/OSWER/TIFSD**

The Technology Innovation & Field Services Division (TIFFS) provides technical support which includes direct field assistance in responding to incidents and spills, developing or providing analytical services in the field via laboratories, training and support on innovative field investigation and remediation technologies.

**www.cluin.org**

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**W.L. GORE & ASSOCIATES, INC.**

W.L. Gore & Associates, Inc. provides passive sampling services for air, soil, gas and water using the patented GORE™ Module constructed of the waterproof, vapor-permeable GORE-TEX® membrane.

**www.gore.com/surveys**

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**Fall 2010 Session Descriptions**

**Board of Advisors Meeting** – The ITRC Board of Advisors serves the ITRC membership and is responsible for ITRC leadership and strategic direction. Nine voting members comprise the Board (6 states, 1 private sector, 1 state association, and 1 public stakeholder), as well as the non-voting Federal Liaisons representing ITRC’s funding partners. The purpose of this meeting is to focus on ITRC work planning for 2011 as well as finalizing the call for new project proposals for 2012. This meeting is open only to Board of Advisors members.

**IAP Member Lunch Meeting** – This is a session for ITRC IAP members only to coordinate private sector involvement across ITRC Project Teams.

**LNAPL Classroom Training DryRun** – (for ITRC State POCs and invited guests only) This dry run training class serves as the final major step in the development of ITRC’s new LNAPLs (light, nonaqueous-phase liquids) focused, 2-day classroom training course. ITRC State POCs and other invited guests will participate in this practice event to assist the LNAPL instructors in finalizing their course materials and delivery. The ITRC LNAPLs course will be scheduled for public offerings beginning in 2011.

**LNAPL Classroom Training Debrief Meeting** – This meeting is open only for the ITRC LNAPL instructor team and support staff to consider potential changes resulting from feedback provided during the LNAPL classroom training dry run on Monday and Tuesday. Lunch will be provided.

**Munitions Restoration Workshop** – In the next 10 years, munitions sites across the country will be investigated and restored, with expenditures in the billions of dollars. In order to participate in the munitions response process, state environmental regulators should be familiar with the newest processes and technologies for munitions detection and discrimination. This workshop, facilitated by US EPA and DoD, will provide basic information on munitions response processes and will detail innovative detection, discrimination and classification technologies by experts in the field. A group discussion on potential new munitions projects for ITRC will be held at the end of the workshop.

**Plenary Session** – This session will offer environmental professionals from across the country an opportunity to network and collaborate on innovative approaches to solving environmental challenges. Leading environmental experts will share their states’ experiences with the Deepwater Horizon Oil Spill of National Significance and explore the current technologies and approaches for oil clean up, including the technical areas where further work is still needed. In addition, the plenary session will offer an array of technical presentations from leaders in the field on solutions to other environmental challenges as well as an introduction to
Fall 2010 Session Descriptions

ITRC’s first web-based technical and regulatory guidance document developed by the Mining Waste Team. ITRC leadership will also hold Co-Chair elections and recognize this year’s award winners.

Project Team Meetings – ITRC project teams consist of environmental professionals with diverse environmental perspectives working to develop guidance documents and associated training courses to promote better decision-making when considering innovative environmental technologies and approaches. The result of these projects is a broadened technical knowledge and streamlined regulation of new environmental technologies within the environmental community. These state-led teams consist of members from state regulatory agencies, federal agencies, academia, public and tribal stakeholders, and the private sector. The purpose of these team meetings is primarily for team members to further the development of ITRC products, however, non-members are also welcome to observe.

Reception and ITRC 15 Year Anniversary Celebration – This reception will celebrate ITRC’s 15 Years Advancing Environmental Solutions with ITRC member performances and presentations. Attendees will find this relaxed setting to be ideal for both networking and catching up with your ITRC colleagues.

Stakeholder Member Lunch Meeting – This is a session for ITRC Stakeholder members only to coordinate Stakeholder member involvement across ITRC Project Teams.

State Engagement (POC) Breakfast Meeting – Open only to ITRC State Points of Contact (POCs), this meeting will advance the opportunities for states to achieve value through their ITRC participation. The State Engagement Program promotes the use of ITRC documents and training within the states; leads efforts to identify state priorities for future ITRC projects; provides input for increasing the usability and quality of ITRC products; and identifies implementation results.

Exhibitors

BEACON ENVIRONMENTAL SERVICES, INC.  
www.beacon-usa.com  
To design an accurate conceptual site model and streamline your remediation and monitoring program, you must begin with accurate data. BEACON’s time-integrated passive soil gas and indoor air surveys provide you with high-quality, accurate data needed to guide your projects.

CETCO LIQUID BOOT  
www.cetco.com  
CETCO provides cost-effective engineered solutions to challenging environmental remediation projects worldwide. Applications include gas vapor mitigation systems, remedial barriers, active sediment treatment and capping, in-situ solidification/stabilization, and hazardous waste cleanup.

JRW BIOREMEDIATION, LLC.  
www.jrwbioremediation.com  
JRW is a leading supplier of bioremediation products such as WILCLEAR® sodium lactate and LactOil™ soy microemulsion, for the enhanced in-situ remediation of chlorinated solvents, metals, and perchlorate.

NAVAL FACILITIES ENGINEERING COMMAND (NAVFAC)  
https://portal.navfac.navy.mil  
The Naval Facilities Engineering Command (NAVFAC) provides facilities, installation, and contingency engineering support and services to the Navy/Marine Corps. NAVFAC’s environmental program provides high quality support and services in planning, compliance, pollution prevention, natural resources, and site restoration.

SERDP AND ESTCP  
www.serdp.org / www.estcp.org  
The Strategic Environmental Research and Development Program (SERDP) and the Environmental Security Technology Certification Program (ESTCP) are the Department of Defense’s environmental technology programs.
Current Team Descriptions

Attenuation Processes for Metals and Radionuclides
Team Leaders: Dib Goswami (WA) and Carl Spreng (CO)
Program Advisor: Daniel Ruedy (HydroGeoLogic, Inc.)
Project: Develop a framework to facilitate implementation of the new EPA guidance for monitored natural attenuation of metals and radionuclides. This framework will provide a consistent basis for states, stakeholders, federal agencies, and site owners to evaluate and implement attenuation-based remedies.

Contaminated Sediments
Team Leaders: John Cargill (DE) and Kim McEvoy, (NJ)
Program Advisors: Steve Hill (RegTech) and Judie Kean (RegTech)
Project: Develop a Web-based Technical Regulatory Guidance document on the concepts, process, and use of bioavailability in a risk-based decision framework at a contaminated sediment site. The document will provide a common resource for regulators and practitioners to determine the appropriate application of bioavailability tools and considerations within human health and ecological exposure pathways.

Environmental Impacts of Ethanol and Bio-Based Fuels
Team Leader: Bill Gidley (NE)
Program Advisor: Stacey Kingsbury (HydroGeoLogic, Inc.)
Project: Develop a technical and regulatory guidance document that provides guidance on the environmental impact associated with releases of biofuels to the environment during the transportation, distribution, and storage of these fuels. Topics to be covered in depth include: release scenarios and prevention, site characterization, fate and transport, and remediation strategies. To make the document relevant as new alternative fuels are introduced to the market, the document will describe a process for evaluating alternative fuels that can be applied to new alternative fuels as they are made commercially available.

Environmental Molecular Diagnostics
Team Leaders: Bob Mueller (NJ) and Bonnie Pierce (WY)
Program Advisor: Lesley Hay Wilson (Sage Risk Solutions LLC)
Project: Collect and summarize the fundamental background and current status of available environmental molecular diagnostic (EMD) tools. The team will provide objective guidance on the best practices for using EMDs; determine appropriate uses of the EMDs, including their strengths and limitations; and provide support evaluating, applying and interpreting the results of EMDs. Technical and regulatory guidance will lead to greater use and confidence in these diagnostic tools, and help site managers faced with major decisions about site design, management and resolution. Molecular biological tools (MBTs) and chemical diagnostic techniques consist of both laboratory and field methods, and some of these techniques have already been adapted for use in environmental restoration. Others are expected to be available for field application in the near future.
Current Team Descriptions

Green & Sustainable Remediation
Team Leader: Tom O'Neill (NJ)
Program Advisor: Sriram Madabhushi (Booz Allen Hamilton)
Project: Produce a Technology Overview document explaining what Green/ Sustainable remediation is and how GSR is beginning to be implemented in new state and federal programs. Survey ITRC states, partners, and stakeholders (internal and external) on the interest in and focus of a Technical Regulatory guidance document. Begin work on the Technical Regulatory guidance document based on survey results and building from the Technology Overview effort.

Incremental Sampling Methodology
Team Leaders: Mark Malinowski (CA) and Ligia Mora-Applegate (FL)
Program Advisor: Angela Sederquist (Booz Allen Hamilton)
Project: Develop a Technical and Regulatory Guidance document for the appropriate implementation of Incremental Sampling (IS) for soils. The document will provide a sound basis for adapting the IS approach to meet project goals and site-specific objectives. The document includes: overview of IS concepts and principles; IS methods and considerations - with an emphasis on clearly articulated and defined decision units - and sample collection and processing protocols; regulatory considerations and issues; and case studies.

Integrated DNAPL Site Strategy
Team Leader: Naji Akladiss (ME)
Program Advisors: Steve Hill (RegTech) and Judie Kean (RegTech)
Project: Develop an “Integrated DNAPL Site Strategy (IDSS)” to address the technical and regulatory issues involved in an integrated technology DNAPL site remediation strategy. The IDSS will assist decision makers in identifying site conditions that are conducive to source zone clean-up and those where technologies (or combinations of technologies) will control and remediate DNAPL source and plume. The guidance will also help in establishing realistic expectations and goals for cleanups and a methodology for measuring progress towards achieving those goals.

Mining Waste
Team Leaders: Cherri Baysinger (MO) and Paul Eger (MN)
Program Advisors: Steve Hill (RegTech) and Judie Kean (RegTech)
Project: Use case studies and literature searches to provide data and evaluate technologies for treating, stabilizing, reclaiming, and reusing solid mine waste and mining impacted water and evaluate their performance. Develop a guidance document that will assist the user to properly evaluate and apply each technology. Identify regulatory barriers or impediments and recommend specific flexibility when there is a net environmental benefit.

2011 Announcements

2012 Request for Proposal (RFP) and Project Selection Schedule:
• October 2010: ITRC Board of Advisors determines the RFP Focus Topics.
• November 2010: ITRC issues the RFP for 2012 Project Proposals.
• February 11, 2011: Proposals due.
• March 25, 2011: ITRC Board of Advisors completes preliminary evaluation & invites select proposers to present proposal posters at the 2011 ITRC Spring Membership Meeting.
• April 5, 2011: Select proposers present proposal posters to the ITRC members during the 2011 ITRC Spring Membership Meeting.
• June 20—July 20, 2011: ITRC Board of Advisors receives input on select proposals from ITRC membership and votes on a final proposal ranking.
• August—September 2011: ITRC Board of Advisors develop 2012 budget and determine which projects will receive funding.
• January 2012: New Project Teams initiated.
UPCOMING CALL FOR 2012 PROJECT PROPOSALS

In late 2010, the ITRC Board of Advisors will be issuing a request for proposals (RFP) for new 2012 ITRC projects. ITRC projects focus on a particular environmental topic or problem area, but are not research, field testing, or validation projects. ITRC projects are information resources and help break down barriers to the acceptance and use of technically-sound, innovative solutions to environmental challenges through an active network of diverse professionals. Typically, guidance documents and training are developed that focus on streamlining the regulation of innovative environmental technologies and approaches, so that compliance costs are reduced and resources maximized. ITRC projects are completed by state-led teams consisting of state and federal regulators, industry experts, federal partners, academia, and public stakeholders, who work to broaden and deepen technical knowledge and expedite quality regulatory decision-making, while protecting human health and the environment.

The specific benefits ITRC projects offer are:
- increasing environmental professionals’ knowledge-base about and raising their confidence in using innovative environmental technologies;
- saving time and money when evaluating innovative environmental technologies;
- providing regulatory consistency from state-to-state;
- creating networks of technical experts for use when making decisions on innovative environmental technologies;
- avoiding the time and expense of conducting duplicative and costly demonstrations.

2012 Request for Proposal (RFP) Topics:
The ITRC Board of Advisors is currently assessing environmental priority information solicited from ITRC membership sectors (e.g., state regulatory agencies, federal partners, the private sector, and the public) and will focus the RFP on topics relating to those priorities. In addition, the Board of Advisors look for a balance of projects, potential duplication amongst projects, and assesses funding availability to determine the number of selected projects.

Permeable Reactive Barriers: Technology Update
Team Leaders: John Doyon (NJ) and Kimberly Wilson (SC)
Program Advisor: Kathleen Bradley (Noblis)
Project: Develop technical and regulatory guidance document discussing new developments and innovative approaches in the applications of PRBs to treat groundwater contaminants. Additional prove-outs and updates since the previous PRB lessons learned document in 2005 will also be included. The document will emphasize recent advances in biowalls, non-iron reactive media, and newer injection methods.

Solidification/Stabilization (formerly known as ISS Team)
Team Leader: Wilmer Reyes (DE)
Program Advisor: Stacey Kingsbury (HydroGeoLogic, Inc.)
Project: Develop a Technical and Regulatory Guidance document to present methodologies for selection of performance criteria and long term monitoring strategies for solidification/stabilization (S/S). Appropriate performance criteria selection will allow practitioners to apply a consistent assessment methodology that considers the physical, chemical, and site- or scenario-specific management characteristics of the treated materials to meet remedial action objectives and minimize post-treatment impacts to groundwater. Considerations for long-term monitoring will be discussed as they relate to demonstrating that the corrective action meets the goals established for the project.
Groundwater Statistics and Monitoring Compliance

Team Leaders: Ning-Wu Chang, California EPA/Department of Toxic Substances Control & Josh Gowens, Alabama Department of Environmental Management

Project Background:

The goal of this project team is to explain, educate and train state regulators and other practitioners in understanding and implementing the Unified Guidance for Groundwater Statistics and Monitoring Compliance, related monitoring evaluation and optimization software (i.e., GTS, Summit, etc.) as well as new groundwater measurement technology to demonstrate compliance (i.e., groundwater flux and discharge measurement).

US EPA recently (March 2009) issued an 800-page Resource Conservation and Recovery Act (RCRA) Unified Guidance document for Groundwater Statistics and Monitoring Compliance. The challenge for practitioners is to understand, interpret and use the new guidance, which contains significant updates to compliance statistics, in the daily management of their projects. In order to successfully manage groundwater cleanup, resource protection, and demonstrate ongoing compliance, state regulators and project managers require education, training, and practical application of the new RCRA Unified Guidance.

2011 MEMBERSHIP REGISTRATION PROCESS

Membership in ITRC technical teams is on a calendar year basis. Beginning on November 15, individuals can apply for new and ongoing teams for 2011. Potential members are encouraged to apply by mid-January so team leads can determine rosters and make plans.

Before applicants from the private sector can apply for membership on a team, their organization must join (or renew their membership in) the Industry Affiliates Program (IAP) at the Standard or Gold Membership level. Online registration for companies and trade associations for the 2011 calendar year will open on November 1. Organizations can pay immediately by credit card or print out the invoice and mail it with a check to ITRC.
agencies most often characterize the level of contamination in sediments as a bulk concentration not taking into account the actual levels of contamination that are available to impact ecological or human receptors. The Strategic Environmental Research and Development Program (SERDP) and the Environmental Security Technology Certification Program (ESTCP) are developing and transitioning innovative remedial technologies to help the Department of Defense (DoD) perform its mission, cleanup of contaminated sites.

The ESTCP and SERDP 2008 Bioavailability Symposium in Annapolis, Maryland determined two future research and demonstration needs in the area of bioavailability and their use in the risk-based remedial decision-making process at DoD sites.


1. **In Situ Remedies to Reduce Bioavailability of Contaminants in Sediments**
2. **Demonstration and Validation of Tools and Techniques to Monitor the Effects of Remedial Action on Bioavailability.**

At the 2008 ITRC Fall Meeting, POCs identified the need to understand sediment contamination through the evaluation and characterization of contaminant bioavailability. In order to reduce risk and equate it with an appropriate site sediment remediation strategy, the Oregon POC identified that evaluation and remediation of sediments has been, and continues to be, a high priority issue for Oregon DEQ’s Water and Land Quality Program.

This Tech-Reg Guidance will logically transition from the current project that focuses on measurement and application of contaminant bioavailability in sediments, to strategic selection of remedial alternatives and best management practices to mitigate risk at contaminated sediment sites.

- This project supports ITRC’s Missions to develop information resources and help break down barriers to the acceptance and use of technically sound innovative solutions to environmental challenges through an active network of diverse professionals.
- Supports the Strategic Element: “We will continue to develop products that accelerate smart decision-making on remediation sites.”

By developing Tech-Reg documents, environmental customers may properly select and deploy the appropriate and applicable techniques in the following subject areas:

- Identify and evaluate appropriate methods, technologies, and techniques to characterize a site containing contaminated sediments.
- Identify and evaluate the various technologies or techniques, available and emerging, to mitigate exposure to contaminated sediments.
- Identify and evaluate performance monitoring techniques to secure long term stewardship.

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**Leanne Tippett Mosby**

**Director, Missouri Department of Natural Resources**

Ms. Leanne Tippett Mosby has been with the Missouri Department of Natural Resources since 1994. She began her career with the department in the Air Pollution Control Program, working in enforcement and permitting. In 2000, Mosby accepted a position in the department director’s office in the policy group. There she served as a legislative liaison and worked on policy issues in several areas including air quality, the Missouri River and lead contamination in Herculaneum. In 2003, Mosby became the director of the Air Pollution Control Program where she enjoyed working with a great team to advance air quality goals while improving customer service and increasing stakeholder involvement. In 2005, Mosby moved to the department’s Division of Environmental Quality as deputy director. In November 2009, she became the acting division director of the reorganized Division of Environmental Quality, which was merged with the former Field Services Division. In September 2010, she was appointed director of the division. The division encompasses all of the environmental media programs (Air Pollution Control, Water Protection, Hazardous Waste, Solid Waste and Land Reclamation), the five regional offices (St. Louis, Kansas City, Springfield, Macon and Poplar Bluff) and the Environmental Services Program.
Chris M. Piehler  
Water Quality Assessment Division Administrator  
Louisiana Department of Environmental Quality

Mr. Chris M. Piehler is the Water Quality Assessment Division Administrator with the Louisiana Department of Environmental Quality. He has worked for several Departments in Louisiana state government for over 28 years in various positions relative to management of aquatic resources and has a Master of Science Degree from Northwestern State University. He has been with the DEQ for over 20 years, coordinated and managed compliance inspection activities, worked with the DEQ Mercury Program intensively since 1999 and has conducted numerous contaminant studies, assisting in the administration of Surveillance Division activities as they relate to water resources since 1999. Other duties at DEQ have included managing the Louisiana Ambient Water Quality Monitoring Network and involvement in spill response issues and events. He authored the Louisiana Mercury Risk Reduction Plan to address environmental mercury issues in Louisiana and the Louisiana Clean Waters Plan, the goals of which are to improve surface water quality statewide. Piehler received the Louisiana Governor’s Award from the Louisiana Wildlife Federation and the National Wildlife Federation and was named Conservationist of the Year for 2007.

The Summer of Oil: Louisiana and the Blowout in the Mississippi Canyon

On April 20, 2010, the Deepwater Horizon exploded in the Gulf of Mexico due to ignition of hydrocarbons released from a blowout of the Macondo well in Mississippi Canyon Block 252. Eleven people on board the rig perished. The ensuing discharge became the largest volume of spilled oil in United States history in the offshore environment, estimated to be 4.4 million barrels. By April 29, the event was officially named a Spill of National Significance (SONS), defined as “a spill that, due to its severity, size, location, actual or potential impact on the public health and welfare or the environment, or the necessary response effort, is so complex that it requires extraordinary coordination of federal, state, local, and responsible party resources to contain and clean up the discharge”. The responsible party operations including well control, impact mitigating measures, human and environmental resource protection measures, and restoration planning. Although the flow of oil into the Gulf from the well ceased on July 15, response and damage assessment efforts continued through the present and remain ongoing. The Louisiana Department of Environmental Quality was and continues to be involved with many aspects of the incident (save for well control), and as such will provide information on experiences witnessed through the Unified Command and Natural Resource Damage Assessment activities.

Strategy for Remedial Decision-Making at Contaminated Sediment Sites

Team Leaders: John Cargill, Delaware Department of Natural Resources and Environmental Control (DNREC)/Site Investigation and Restoration Branch & Co-Leader: TBD

Project Background:

Quoting the USEPA Contaminated Sediment Management Strategy: "The U.S. Environmental Protection Agency estimates that approximately 10 percent of the sediment underlying our nation’s surface water is sufficiently contaminated with toxic pollutants to pose potential risks to fish and to humans and wildlife that eat fish. This represents about 1.2 billion cubic yards of contaminated sediment out of the approximately 12 billion cubic yards of total surface sediments (upper five centimeters) where many bottom dwelling organisms live, and where the primary exchange processes between the sediment and overlying surface water occur." Based on current average costs for managing contaminated sediments, this volume of material could cost several trillions dollars. The primary risk pathway at contaminated sediment sites are drinking water supplies and the food chain. EPA Regions and states independently have made decisions in the absence of guidance, which has led to inconsistencies relative to geopolitical boundaries (e.g. state boarders, port authorities). Debate continues regarding the latest and in some cases rapidly evolving sediment quality criteria and their appropriate application for assessing and remediating contaminated marine and freshwater sediments.

The current ITRC sediment team process is tending to the lack of understanding and sometimes the misunderstanding of bioavailability of contaminants in freshwater and marine environments. Over 25 percent of the contaminated sediment sites addressed to date in the U.S. have had State drivers. As activity accelerates, this percentage is likely to grow. This proposed guidance will contain the necessary consistency and understanding of the appropriate, cost effective, and protective elements for optimum remediation at contaminated sediment sites.

There is a major debate in the area of contaminated sediment remediation on the appropriateness of mass removal vs. natural recovery or in situ treatment or capping options. The pro-dredging argument focuses on mass removal and permanence; the anti-dredging arguments focus on the destructive impact on the ecosystems (cure is worse than the disease) and the inability to achieve meaningful risk reduction through costly removal of mass. High costs may rule out dredging on many contaminated sediment sites.

The ITRC Contaminated Sediment Team is developing guidance for assessing contaminant risk based upon understanding contaminant bioavailability. Regulatory
During the development of the problem-based technology and regulatory guidance for mining- waste treatment technology selection, the ITRC Mining Waste Team collected some case studies and prepared a technology overview on BCRs. The technology has been applied at mining sites but additional work is continuing to fully evaluate metrics important during deployment.

BCR design is affected by the chemistry and flow of the MIW, particularly pH and temperature as well as the kinetics of the desired microbial processes. In addition to passive systems, BCRs also include active systems (continuous energy and chemical input). Active BCRs show the capacity to treat relatively high flows in a small areal footprint. However, these systems have only been implemented at active mining and mineral processing sites. The active systems typically employ separate tanks or zones for the bioprocesses, chemical reactions, and solids separation. The general differences between active and passive BCRs are presented below.

**Active BCRs:**
- accommodate reasonably high flow rates
- integrate pH adjustment into the water when needed
- allow for recovery of metal sulfides for beneficial reprocessing

In contrast, passive systems utilize designs that incorporate the bioprocesses, chemical reactions and the bulk of solids separation within an organic substrate.

**Passive BCRs:**
- reduce the need for intensive operation and maintenance requirements
- facilitate the use of cost-effective materials for construction
- include the use of local materials easily obtainable for substrate media
- reduce the need for construction practices requiring advanced technologies

Hybrid systems, or semi-passive systems, have also been built. These usually provide an external carbon source (e.g. ethanol) and may also recirculate water to optimize treatment. These systems require some energy to power small chemical feed pumps and possibly recirculating pumps. For systems with just small feed pumps, solar or wind power can be used. These systems require some weekly and periodic maintenance to ensure proper operation.

Based on the initial work of the ITRC Mining Waste Team, BCRs were chosen as a promising technology that needed to be further investigated and developed into a technology-based guidance. The technology is attractive and EPA has employed systems at several sites. Initial treatment has been effective but long-term performance and costs are important issues particularly since states are generally responsible for the long-term operation and maintenance at abandoned sites. BCRs generally provide treatment and can dramatically improve water quality but sometimes do not continuously meet strict numeric criteria. An understanding of how and when bioreactors can be successfully used is critical. States have been reluctant to accept this technology, and a guidance document is needed to facilitate acceptance and use of this innovative technology. It is important to realize that BCRs are not limited to MIW and the technology can be applied to any metal-contaminated water.

Yvonne Najah Addassi
California Department of Fish and Game
Office of Oil Spill Prevention

Ms. Yvonne Najah Addassi received her Master of Science in Ecology and Environmental Policy from the University of California, Davis in 1997 and her Bachelors of Sciences in Biology in 1985. For the past 19 years, she has worked as an environmental scientist for the Office of Oil Spill Prevention and Response (OSPR). For 15 years, she was in charge of the Alternative Response Technologies (ART) program with responsibility for: coordination for the statewide licensing, approval and use of oil spill cleanup agents; development of statewide policies and procedures for the use of in-situ burning and dispersants as well as serving as the State’s alternate for the Regional IX Regional Response Team. During the Deep Horizon Oil Spill response, Ms. Addassi served as an ART technical specialist for NOAA in the Houma command post. Ms. Addassi has published several papers including those on in-situ burning and dispersant policy development, modification of wildlife operations to meet changing needs and the and the use of Net Environmental Benefit Analysis. She served more than 10 years as an advisory board member for the Oiled Wildlife Care Network, a member of the Science Advisory Panel for Coastal Response Research Center, serves on the board of directors for the California Association of Professional Scientists and served on the National Academy of Science’s Committee on Understanding Oil spill Dispersants: Efficacy and Effects. Currently Ms. Addassi works as Senior Environmental Scientist, supervising OSPR’s northern scientific field staff with jurisdiction from Monterey County to the Oregon border.

Deepwater Horizon Oil Spill: Case study for Standing-Up a Large-Scale Alternative Response Technologies Review, Testing and Evaluation Program

The use of new and improved technologies in oil spills has long been deemed an important part of the response “tool box.” The need for research and testing for new technologies was acknowledged in the Oil Pollution Act of 1990, which established an Interagency Coordinating Committee on oil pollution research. Analogous oil spill legislation for the State of California took the standard further by requiring the use of “best available technology” in meeting a standard of best achievable protection for the coast and marine resources. The scale and scope of the Deepwater Horizon Oil Spill, the expectations of the public and political decision-makers as well as the changing operational needs of responders, required an unprecedented need for “real time” technology review, evaluation and testing and the development of an expanded approach to meeting these needs within the Unified Command Structure.

In the early days of the response, the Unified Command called for the estab-
lished a comprehensive Alternative Response Technologies (ART) Organization that in the end, encompassed three incident command posts as well as the Unified Area Command. General organizational tasking included; development of a system for gathering and cataloging new ideas; a triaging system for review and process of submittals; technical review and scoring of the submittals; prioritization of submittals; testing of promising technologies. A high interest technology test team (HITT) was established quickly for testing of technologies that addressed emergency operational needs identified for the Houma and Mobile Command Posts. Strike teams were established as needed to address specialist areas of concern, such as bioremediation and biorestitution of sensitive shorelines. In Houma, ART technical specialists reported to the Environmental Unit, were tasked with addressing the technology needs of operations and shoreline cleanup assessment teams addressing any wildlife concerns and supporting the public information and liaison officers in public and town-hall meetings. As the needs of the response changed, the ART organization also transitioned from support to emergency operations to those of clean-up and long-term needs.

The scale of the ART organization in response to the deep horizon oil spill was unprecedented and provided a unique opportunity to “scale up” what is typically a workload addressed by 2 or 3 technical specialists. This presentation will outline the goals and structure of the ART organization, include staffing considerations and summarize proposals evaluated and technologies tested.

NEW 2011 PROJECTS
The ITRC Board of Advisors has selected the following projects to move forward in 2011:

Biochemical Reactors to Treat Metals in Mining-Influenced Water
Team Leaders: Paul Eger, Minnesota Department of Natural Resources & Cherri Baysinger, Missouri Department of Health and Senior Services

Project Background:
Mining influenced water (MIW) is a major environmental problem in mining districts throughout the U.S. and around the world. Water quality impacts vary from elevated suspended solids to acid mine drainage. Elevated suspended solids generally occur through erosion of mine wastes, causing increased turbidity and potential aquatic impacts following deposition. Acid mine waters are produced in mined rock masses or mining/milling waste piles containing sulfide minerals with insufficient neutralizing capacity. Oxidation of these sulfide minerals produces acid and releases metals into solution. These problems can persist for tens to hundreds of years. Over 10,000 miles of receiving waters in the United States are affected by MIW. MIW is difficult to treat cost-effectively to levels protective of human health and the environment.

A biochemical reactor (BCR) generically implies a system that cultivates microorganisms that transform contaminants or produce chemicals that can be used for remediation or treatment. The most commonly used BCRs for treating MIW are operated anaerobically, i.e. in the absence of oxygen, require a carbon source and sulfate and are often called sulfate-reducing bioreactors (SRBRs). The microbial process of sulfate reduction produces sulfide and bicarbonate. A number of target metals (e.g., cadmium, copper, nickel, lead, and zinc) in MIW will precipitate as metal sulfides at pH values above 5.0. The bicarbonate promotes an increase in pH and will promote the removal of some metals as carbonates (e.g., Iron (II) Carbonate (FeCO₃) and Zinc Carbonate (ZnCO₃)) under the appropriate conditions (e.g., specific pH and carbonate concentration). Additionally, redox active metals and metalloids (e.g., arsenic, chromium, selenium, and uranium) that form stable precipitates under neutral reducing conditions may also be targeted.

Thus, BCRs may be applicable to a broad range of metal and metalloids found in MIW. If space is not a limitation, then BCRs can be designed to address a wide range of flows, acidity and metals loading. BCRs are attractive since they can be built with local materials and often can be designed to operate without any external inputs of energy or material and require minimal maintenance. As a result, BCRs can be built to provide passive treatment and may be particularly suitable for remote and abandoned sites.
Stephen C. Geiger, Ph.D., CPSS
AECOM Environment & ITRC Contaminated Sediments Team Member

Dr. Stephen Geiger is an environmental scientist with AECOM, with over 25 years of consulting and R&D experience. He specializes in the measurement and application of the bioavailability of metals and organics in soils and sediments, environmental chemistry/geochemistry, human health and ecological risk assessments, and the statistical analysis of environmental data. He has participated in three ITRC teams (Small Arms Firing Ranges, Phytotechnologies, and Contaminated Sediments).

He was part of the Sediment Contaminant Bioavailability Alliance (SCBA), which developed a laboratory-based method to assess the bioavailability of organic compounds in sediments (EPA SW846 Method 8272 and ASTM Method D7363–07). Dr. Geiger has conducted sediment bioavailability studies for the utility and aluminum industries within the U.S. and Canada.

Dr. Geiger has a BA in biology from Gettysburg College, an MS in soil science from Rutgers University, and a Ph.D. in soil chemistry from Texas A&M University. Dr. Geiger is a Certified Professional Soil Scientist (CPSS).

State of the Art of Bioavailability in Contaminated Sediments: Integrating Science into a Tiered Regulatory Framework at PAH-Contaminated Sediment Sites

Risk-based closure of complex sediment sites typically involves a tiered or phased approach incorporating multiple lines of evidence (LOEs) into a weight-of-evidence (WOE) determination of risk. For PAH-contaminated sites, phases of work may include screening level analyses of total PAH data, evaluation of pore water PAH data (both modeled and analytically-derived), and evaluation of a variety of biological and toxicological metrics relating to lethal and sub-lethal effects on aquatic organisms. However, integrating these LOEs into a decision-making framework is often not straightforward, and there is a clear need for a standardized framework for risk management decision making at these sites.

When benthic organisms are identified as the relevant receptors at a PAH-contaminated site, the 2003 U.S. EPA guidance Procedures for the Derivation of Equilibrium Partitioning Sediment Benchmarks (ESBs) for the Protection of Benthic Organisms: PAH Mixtures can be used to evaluate the site. This guidance presents the use of equilibrium partitioning (EqP) theory to derive porewater PAH concentrations from total PAHs and relates these to appropriate water
quality criteria that are presumed protective of these organisms. However, recent research indicates that the use of EqP may overestimate actual porewater concentrations because it does not take into account the presence of anthropogenic carbon (“black carbon”), which has been demonstrated to more strongly sorb PAHs than naturally-occurring organic matter. Based in part on this research, the 2009 U.S. EPA document *Evaluating Ecological Risk to Invertebrate Receptors from PAHs in Sediments at Hazardous Waste Site* presents a tiered risk-based framework for managing PAH-contaminated sediments. The first tier in this framework uses screening levels and/or EqP-based porewater concentrations to estimate potential organism exposure to bioavailable PAHs. If warranted, a second tier of evaluation is proposed that employs direct analysis of porewater using a variety of traditional and innovative analytical methods. Finally, based on the results of the second tier evaluation, a third tier of evaluation involving site-specific laboratory toxicity testing may be applied.

An evaluation of sediment data from PAH-contaminated sites indicate that the use of screening levels or EqP is not as robust as the direct analysis of porewater PAHs, and that the use of benthic toxicity testing may at times be redundant with the direct porewater PAH measurement. At these sites, the use of the suggested management framework could potentially enable a more cost-effective evaluation and remedial action than that which would result from the application of traditional weight-of-evidence methods.

**Integrated DNAPL Site Strategy**
Tamzen Macbeth — Camp, Dresser, & McKee, Inc. (CDM)

**Mining Waste**
Mike Sieczkowski — JRW Bioremediation, L.L.C.

**Permeable Reactive Barriers: Technology Update**
Peter Zawisianski — Terraphase Engineering, Inc.

**Remediation Risk Management**
Rula Deeb, Ph.D. — Malcolm Pirnie, Inc.

**Solidification/Stabilization**
Thomas Plante — Haley & Aldrich, Inc.

**VAPOUR INTRUSION INSTRUCTOR AWARDS:**
John Boyer — New Jersey Department of Environmental Protection
Robert Ettinger — Geosyntec Consultants
David Folkes — EnviroGroup Limited
Blayne Hartman — Hartman Environmental Geoscience
Todd McAlary — Geosyntec Consultants
Robin Mongeon — New Hampshire Department of Environmental Services
William Morris — EnviroGroup Limited
TEAM LEADER OF THE YEAR:
Carl Spreng — Attenuation Processes of Metals and Radionuclides

POC AWARDS:
Long-Term Service:
James Harrington — New York State Department of Environmental Conservation And
Ted Dragovich — Illinois Environmental Protection Agency

Outstanding Service:
Neil Taylor — State of Utah Department of Environmental Quality

STAKEHOLDER AWARDS:
Michael Chacon — Attenuation Processes for Metals and Radionuclides
Jeff Short — Green and Sustainable Remediation
Kathy Owens — Incremental Sampling Methodology

IAP AWARDS:
Attenuation Processes for Metals and Radionuclides
Jennifer Nyman, PhD — Malcolm Pirnie, Inc.

Contaminated Sediments
Steve Clough — Haley & Aldrich, Inc.

Environmental Impacts of Ethanol and Bio-Based Fuels
Denice Nelson — Arcadis

Environmental Molecular Diagnostics
Dora Ogles — Microbial Insights, Inc.

Green and Sustainable Remediation
Karin Holland — Haley & Aldrich, Inc.

Incremental Sampling Methodology
Philip Goodrum — Arcadis

Earl Crapps
Alaska Department of Environmental Conservation & ITRC Incremental Sampling Methodology Team Member

Mr. Earl Crapps has been an Environmental Program Specialist in the Response Fund Administration and Contaminated Sites Programs at the Alaska Department of Environmental Conservation (ADEC) in Anchorage, Alaska since 2002. He is responsible for all chemistry-related issues for the Contaminated Sites Program, guidance documents and regulatory revisions. Earl was one of the primary authors of the program’s Draft Guidance on Multi-Incremental Soil Sampling (March 2009) and remains the point of contact for all contaminated site projects involving its use. Prior to joining ADEC, Earl worked for over 12 years at local analytical laboratories and environmental consulting firms, as a Chemist, Project Chemist and Laboratory Manager. He performed and reported a variety of environmental analysis according to state and federal methodologies and was responsible for the evaluation and validation of environmental laboratory data. Earl was born and raised in Anchorage, Alaska. He earned his BS degree in Biology, with minors in Chemistry and Mathematics, in 1987 from Spring Hill College, in Mobile, Alabama.

State of the Art of Incremental Sampling Methodology Science and Application
Since the inception to investigate and remediate contaminated sites, countless soil samples have been collected and sent to laboratories for chemical analysis. A majority of these soil samples were collected as discrete samples, with varying results that were often difficult to evaluate, interpret, and/or base defensible decisions on. Many of the soil sample data issues can be attributed to the heterogeneity of the soil matrix and the lack of representative sample collection and sample preparation. In an effort to improve the representativeness of soil samples, some professionals in the environmental field have recently advanced an approach generally known as incremental sampling methodology. Incremental sampling methodology is a structured sampling protocol whose goal is to obtain a representative mean concentration for a defined volume of soil or decision unit. Incremental sampling is finding wider acceptance as a sampling method that addresses many of the issues that challenge every soil sampling effort.

The presentation will focus on a brief description of incremental sampling methodology, examples of field implementation, challenges and limitations, regulatory perspectives, and the ITRC Incremental Sampling Methodology team technical and regulatory guidance document.
Charles J. Newell, Ph.D., P.E.
GSI Environmental Inc. & ITRC Integrated DNAPL Site Strategy Team Member

Dr. Newell is a Vice President of GSI Environmental Inc. He is a member of the American Academy of Environmental Engineers, a NGWA Certified Ground Water Professional, and an Adjunct Professor at Rice University. He has co-authored three EPA publications, five environmental decision support software systems, numerous technical articles, and two books: Natural Attenuation of Fuels and Chlorinated Solvents and Ground Water Contamination: Transport and Remediation. His professional expertise includes site characterization, groundwater modeling, non-aqueous phase liquids, risk assessment, natural attenuation, bioremediation, non-point source studies, software development, long-term monitoring optimization, and sustainable remediation projects. Dr. Newell was awarded the Hanson Excellence of Presentation Award by the American Association of Petroleum Geologists and the Outstanding Presentation Award by the American Institute of Chemical Engineers. He is an active member of the ITRC’s Integrated DNAPL Site Strategy (IDSS) Team.

Mass Discharge/Mass Flux: An Emerging Tool for Evaluating Groundwater Contaminant Plumes

In the past, groundwater scientists and engineers have used concentration as a key decision making metric when managing contaminant plumes in groundwater. For example, remediation of contaminated groundwater to drinking water standards (Maximum Contaminant Levels) or some type of risk-based concentrations have been common remediation goals. However, an increasing number of groundwater researchers, practitioners, and regulators are now advocating use of mass discharge/mass flux techniques to gain a better understanding of groundwater plumes and how to remediate them. Mass discharge combines both groundwater concentration and groundwater flow data into a single metric with units of mass per time. With a mass flux analysis, the distribution of mass discharges across a plume is revealed.

While not a new concept, the use of mass discharge/mass flux techniques at contaminated groundwater sites has become much more popular over the past several years. Key factors in driving this new emphasis include the availability of new groundwater characterization techniques and technologies, a perceived need by some for an alternative metric to stringent concentration-only based remediation goals, and an increased appreciation that the scale of a groundwater contamination problem is directly related to both concentration and flow.

ITRC 2010 Awards

Each year the ITRC Board of Advisors honors several individuals and a technical team who they believe have contributed over and beyond to the accomplishment of the ITRC mission and who have demonstrated leadership and innovation.

In addition, ITRC Team Leaders honor one Industry Affiliate Member Company with an award as well that honors their contribution to the work of the team. IAP member companies selected for this award receive the benefit of reduced dues for 2011 membership. The below list contains the winners of these awards for 2010. These individuals and team will also be publically recognized during the meeting’s Plenary Session on Wednesday.

TEAM OF THE YEAR:
Contaminated Sediments
Dave Barclift
Kristin Bell
David Bonnett
Charles Brigance
Kim Brown
John Cargill, Lead
Sandip Chattopadhyay
Arthur Chin
Steve Clough
Robert Craig
Stacey Curtis
KariAnne Czajkowski
Steven Dischler
Paul Doody
Robert Dorr
Sonja Favors
Robert Ford
Edward Garvey
Stephen Geiger
Rajat Ghosh
Allan Harris
Amy Hawkins
Brad Helland
Ian Hers

Steve Hill, Program Advisor
Jay Hodny
Robert Hoke
Wanda Holmes
Harley Hopkins
Andrew Joslyn
Judie Kean, Program Advisor
James Kitchens
Mark Kleiner
Anna Knox
David Lee
Todd Linley
Terrence Lyons
Robert MacLeod
Diana Marquez
Kimberly McEvoy, Lead
Patricia McIsaac
John Mellow
Tara Meyers
Evelina Morales
Linda Mortensen
Greg Neumann
Joe Odencrantz
Osaguona Ogbebor

Jim Olsta
Christopher Poulsen
Danny Reible
Jeff Riddle
Bruce Robinson
Mark Rodriguez
Shelley Samaritoni
Geetha Selvendran
Bhawana Sharma
Lori Siegel
George Shaw
Tamara Sorell
Brent Stafford
Todd Struttmann
Jennifer Sutter
Brandon Swope
William Sy
James Taylor
David Thal
Timothy Thompson
Marvin Unger
Jim Whetzel
Charles Wilk
Marshall Williams
Several methods are now available to conduct mass discharge/mass flux measurements. The traditional system is the transect approach, where high-resolution sampling is performed in a vertical plane perpendicular to groundwater flow. Other methods being applied include new passive flux meters, specialized pump tests, and use of computer models that combine flow and concentration.

Mass discharge/mass flux is being applied in a variety of ways, including characterizing plumes to identify remediation hot spots, designing remediation systems, analyzing natural attenuation processes, evaluating remediation performance, conducting risk assessments, and classifying plumes by the magnitude of a particular plume’s mass discharge. However, one key issue in the implementation is how to estimate and manage the uncertainty involved in the mass flux/mass discharge measurements.

The ITRC Integrated DNAPL Site Strategy (IDSS) team is now completing an overview of mass discharge/mass flux concepts and measurement methods for groundwater plumes. Internet training starting in November will complement this Technology Overview.
Mine Waste Treatment Technology Selection

New Web-based Tech-Reg document from ITRC helps regulators, consultants and stakeholders assist in selecting an applicable technology, or suite of technologies, which can be used to remediate mining waste contaminated sites.

Decision trees, through a series of questions, guide users to a set of treatment technologies that may be applicable to that particular site situation. Each technology is described, along with a summary of the applicability, advantages, limitations, performance, stakeholder and regulatory considerations, and lessons learned. Each technology overview links to case studies where the technology has been applied.

Background

Mining produces millions of tons of waste each year. Historical mining practices and the absence of routine mined-land reclamation, remediation, and restoration have led to legacy sites with significant environmental and human health impacts. Contaminants from unreclaimed or unremediated areas have affected millions of acres of land and over 10,000 miles of stream. New mining operations continue to have severe waste issues that must be addressed during and after the actual mining operation. Conventional remedial solutions are often lengthy, expensive, and unacceptable to the regulated and regulatory communities, as well as to the public.

This ITRC Web-based “Mine Waste Technology Selection” site can assist users in selecting an applicable technology, or suite of technologies, which can be used to remediate mine waste contaminated sites.

Benefits

- Web-based, quick tool to work through decision trees and identify appropriate technologies
- Applies to all potentially affected media
- Includes technology overviews
- Access to case studies
- Describes potential regulatory constraints
- Applicable information for state, federal, industry and stakeholders
- Helps streamline/expedite review process
- Reference tool for new personnel

Actions

Here’s what you can do to bring ITRC benefits to your state:

- Promote use of this guidance and FREE Internet-based training with your staff as well as with site owners and their consultants
- Consider using the guidance as a tool to update existing state guidance
- Provide your state’s concurrence on the guidance document
- Report to ITRC, via your state POC, any successes or concerns related to this guidance