

INTERSTATE TECHNOLOGY & REGULATORY COUNCIL

Quarterly Update

December 2003



Fall in Monterey

forging ahead on ITRC products

Nearly 300 members and interested parties attended the 2003 Fall Meeting in Monterey, California in late September. During the three-day meeting, teams took advantage of many opportunities to work on their team products and network with other members. Lenny Siegel, director of the Center for Public Environmental Oversight, was the keynote speaker at the opening plenary session. Other speakers included ITRC cochair Ken Taylor, who updated attendees on ITRC's 2003 progress, and ERIS Board member Ron Hammerschmidt, who presented recent activities of the ERIS Board of Directors. Another highlight of the plenary session was the election of Bob Mueller (N.J.) as the new ITRC cochair to replace Brian Griffin, who recently stepped down (see article, page 3).

During a reception following the plenary, several ITRC members were recognized for their contributions to ITRC. Outstanding POC awards were given to David Randolph (Tenn.) and Rob Weber (Kan.). The Brownfields Team received the 2003 Outstanding Team of the Year Award. Brownfields Team leader Christine Costopoulos accepted the award on the team's behalf. ITRC also awarded 2003



Outstanding Team Member Awards to John Chambliss

(Wetlands), Peter Strauss (Small Arms Firing Range and Wetlands), Linda Fiedler (DNAPLs and MTBE-Contaminated Groundwater), and Eric Nuttall (In Situ Bioremediation). Also, outgoing ITRC Board of Advisors members Paul Hadley, state engagement coordinator, and Brian Griffin, board cochair, were recognized for their contributions to ITRC.

Rick Tomlinson, former ITRC program director, was honored for getting the ITRC program off the ground, including taking ITRC membership from 20 states to the current 41 and significantly increasing the number of members from approximately 100 to more than 400 today.

A unique and particularly successful event at this fall's meeting was the state-led implementation breakfast workshop, which afforded an opportunity for members to meet the points of contact (POCs) and others from their state who are also involved with ITRC. Members enjoyed getting to know fellow state members and gaining an understanding of how their states' participation in ITRC benefits environmental remediation in their states.



Paul Hadley, Board of Advisors member and state engagement coordinator, presented Outstanding POC Awards to David Randolph, Tennessee (left) and Rob Weber, Kansas (right).





ITRC presented Outstanding Team Member Awards to John Chambliss, Wetlands Team (top left); Peter Strauss, Small Arms Firing Range and Wetlands teams (top right); Linda Fiedler, DNAPLs and MTBE-Contaminated Groundwater teams (right) with Board of Advisors member Bart Faris); and Eric Nuttall, In Situ Bioremediation Team (not shown).



Gary Baughman, Colorado POC and former board member (left), chats with Dave Jewett and Ken Taylor.

Congratulations to new cochair Bob Mueller

At the Fall Meeting in Monterey, ITRC members elected Bob Mueller as cochair of the ITRC Board of Advisors. Bob fills a position left vacant when Brian Griffin stepped down. Bob will serve with Ken Taylor



(S.C.) as they jointly guide the Board of Advisors in working with the ERIS Board to promote ITRC.

Bob is no stranger to ITRC. He joined the organization in 1996 as a member of the Metals in Soil Team, and since then Bob has capably led, with the help of Dib Goswami (Wash.), the Phytotechnologies, Constructed Wetlands, Mitigation Wetlands, and Small Arms Firing Range teams.

Bob comes to ITRC by way of the New Jersey Department of Environmental Protection, Office of Innovative Technology and Market Development. Bob works with the department's environmental certification program and develops research projects to evaluate new technologies. He earned an M.S. in environmental science in 1982. Bob is married with three college kids and lives in Newtown, Penn. In his spare time, he umpires baseball, referees basketball, and enjoys playing golf.

ITRC finds common ground with WHC

The Wildlife Habitat Council and ITRC have something in common—both organizations are seeking efficient and cost-effective ways to couple the restoration of contaminated sites with the improvement of wildlife habitat. This common purpose has led the two organizations to agree, through a formal memorandum of understanding, to cooperate in fostering the use of innovative environmental technology, streamlining environmental technical and regulatory criteria, and improving training and technology transfer.

WHC recognized the need for regulatory flexibility in obtaining permits to use natural remediation technologies as part of a remediation strategy, as well as to implement cleanups where the goal is to create or improve wildlife habitat. ITRC saw a natural fit between several of its teams' goals and those of WHC. Specifically, the Alternative Landfill Technologies, Brownfields, Constructed Treatment Wetlands, In Situ Bioremediation, Mitigation Wetlands, Phytotechnologies, and Small Arms Firing Range teams are ideally suited to seek greater use of natural, or "green," technologies to enhance wildlife habitats.

ITRC and WHC signed a formal agreement in July 2003 to cooperate in transferring new and innovative ideas, concepts, and technologies between the two organizations and to collaborate in evaluating ecological solutions at contaminated sites. WHC representatives will promote their interests and values within ITRC by becoming members of teams such as those listed above. ITRC will streamline state regulatory input into joint WHC/ITRC activities and strive to obtain multistate acceptance of innovative concepts and technologies relevant to fostering wildlife habitat. WHC and ITRC will designate liaisons to maintain communication and coordination between the two organizations.

The two organizations have already begun collaborating—several ITRC members participated as part of the technical team that evaluated a recent WHC white paper. Charles Johnson, team leader of the Alternative Landfill Technologies Team; Bob Mueller, coleader of the Constructed Treatment Wetlands, Mitigation Wetlands, and Small Arms Firing Range teams; Charles Harman, member of the Constructed Treatment Wetlands and Small Arms Firing Range teams; and Steve Hill, program advisor for several ITRC teams, vouched for the technical details in "Making the Case for Ecological Enhancements," which includes case studies.

Lucky winner Lisa Kaul!

During the Fall Meeting, Lisa Kaul's name was drawn from all folks who filled out a Document and Training Feedback Survey since January 2003. Lisa of Envector, Inc. in Beverly, Mass. won \$1,000 by completing a survey after "tuning in" to an Internet-based training on natural attenuation of chlorinated solvents in groundwater that was presented on May 29, 2003. ITRC thanks Lisa and all respondents for helping ITRC improve its documents and training courses through user feedback.

Board announces seven new teams for 2004

By Ken Taylor, ITRC Board Cochair

ITRC's Board has announced a record slate of 21 technical teams for 2004. Fourteen are teams that will be continuing activities begun in 2003 or prior years. Seven are teams proposed during ITRC's open season in January through May.

The new teams are

- Arsenic in Groundwater
- Bioremediation of DNAPLs
- Ecological Enhancements
- Indoor Air
- In Situ Chemical Oxidation
- Natural Attenuation and Passive Bioremediation
- Perchlorate in Groundwater

The teams returning in 2004 are

- Alternative Landfill Technologies
- Brownfields
- Contaminated Sediments
- Diffusion Samplers
- DNAPLs
- Mitigation Wetlands
- MTBE-Contaminated Groundwater
- Permeable Reactive Barriers
- Radionuclides
- Remediation Process Optimization
- Risk Assessment Resources
- Sampling, Characterization, and Monitoring
- Small Arms Firing Range
- Unexploded Ordnance

The Board initially reviewed and ranked the more than 20 proposals for new teams during the Midyear Review. The initial list was announced at the Fall Meeting, and the Board completed the final list during a conference call in October. The Board also selected two teams for start up in 2005: Mercury and Mining Wastes.

We thank all the individuals and groups that submitted proposals this year and encourage you to consider resubmitting in future years. As existing teams close out their approved activities, ITRC will bring new teams on board through our established proposal and review process.

Congratulations to all of the 2004 teams. The environmental community will long benefit from the guidance, training, and other information and educational tools you create. Membership renewal and sign up for the existing and new teams begins in December. Please see related article.

Open membership period begins in December

With the 2004 teams selected, ITRC is now entering its open membership period. All current members and interested parties were sent e-mails containing their current information and a renewal form. Please print, complete, sign, and submit the form. Please note that all 2003 members and interested parties must renew for 2004.

ITRC is also inviting new members and interested parties from state and federal agencies and vendor employees, site owners, consultants, academicians, and stakeholders. The membership sign-up form and additional information about membership are available on the ITRC Web site, www.itrcweb.org, under "Membership."

Full membership requires making a commitment of 10% of your time to assist a technical team with its activities. New teams will be finalizing their scopes and then assigning

writing and other tasks to members. Ongoing teams will be revising their scopes and continuing the development of documents, training, and other efforts begun in 2003 as well as embarking on new tasks. In return for a commitment of approximately 200 hours annually, ITRC reimburses travel costs for approved state and stakeholder members.

For individuals interested in team activities but unable to commit 10% of their time, ITRC offers the option of joining as an interested party. Interested parties are kept informed about the team's and ITRC's activities. ITRC prefers that interested parties provide substantive contributions to teams as subject-matter experts and reviewers and in other capacities but recognizes that some individuals cannot sign an agreement to volunteer 10% of their time.

Please review the information about our existing and new teams as well as our membership information on the ITRC Web site and consider joining.

State Engagement Update

State POCs reach out to ITRC federal and state constituents

During the Fall Meeting, state points of contact (POCs) focused on engaging ITRC federal partners and state members. The state POC network strives to strengthen its relationship with ITRC federal partners through interactions with the federal members of the ITRC Board of Advisors and through direct engagement at the project level. During the Fall Meeting, state POCs discussed with federal partners ideas for getting ITRC tools and resources into the hands of those that could benefit from them at the site level.

POCs also found an opportunity during the Fall Meeting to bring state members together to learn from one another about the most effective ways to integrate ITRC into the daily business of state environmental agencies. POCs led state implementation breakfast sessions, where members from states active in ITRC met each other and discussed strategies for bringing greater ITRC benefit to their states. Discussions focused on recruiting new members and documenting how ITRC guidance documents and training resources have saved time and money at projects in their states. In other sessions, POCs discussed ways to engage the private sector, gain state concurrence, engage EPA regions, and define ITRC success within states. These sessions were opportunities for POCs to share challenges and opportunities and to learn from one another.

At this Fall Meeting as in past years, outstanding POCs were recognized (see Fall Meeting article, page 1). The State Engagement Team congratulates Rob Weber (Kan.) for Outstanding Service and David Randolph (Tenn.) for Outstanding Performance.

POCs engage EPA regions

During 2003, POCs are engaging EPA at the regional level. Many EPA regional project managers already take advantage of ITRC guidance document and training courses, but there is a need to reach out to more EPA personnel. By the end of 2003, POCs will have led efforts in at least three EPA regions. In July 2003, Gary Baughman (Colo. POC) and Charles Johnson (Alternative Landfill Technologies team leader from Colorado) led a joint meeting between POCs and EPA Region 8 personnel in Denver, Colo. This meeting introduced EPA Region 8 personnel to ITRC tools and resources and fostered discussions on how to reach a larger number of EPA participants. During October in conjunction with ITRC's Accelerated In Situ Bioremediation classroom training course, Ted Dragovich (Ill. POC) led an ITRC session with EPA Region 5 personnel in Chicago. Plans are also under way within the POC network to meet with officials from EPA Region 7 in Kansas City, an effort being led by Joe Francis (Neb.), Julieann Warren (Mo.), and Rob Weber (Kan.). The goals of these meetings are to showcase ITRC and provide an opportunity for EPA project managers to learn about ITRC tools and resources available to assist them in making quality, expedited decisions when considering innovative technologies and approaches for site characterization, monitoring, or remediation.

Making progress on state concurrence

As ITRC technical teams work to finish their 2003 activities, several technical and regulatory guidance documents are coming to POCs for state review, comment, and concurrence. The following technical/regulatory documents are currently in process:

- Constructed Treatment Wetlands
- Munitions Response Historical Records Review
- Design, Installation, and Monitoring of Alternative Landfill Covers
- Applying the Triad Approach to Environmental Projects
- Using Polyethylene Diffusion Bag Samplers to Monitor Volatile Organic Compounds in Groundwater

The concurrence process, which serves as a formal mechanism to gain state commitment to use ITRC guidance documents, provides predictability for parties wanting to use ITRC technical/regulatory guidance documents for guidance when considering the use of an innovative technology in an ITRC state. POCs are responsible for having the appropriate personnel in their state agencies review ITRC technical/regulatory guidance documents and provide their states' level of concurrence on each document.

If you would like more information on ITRC State Engagement activities, please visit the ITRC Web site at www.itrcweb.org or contact Paul Hadley, ITRC state

engagement coordinator, phadley@dtsc.ca.gov, (916) 324-3823 or ITRC program advisors, Mary Yelken, myelken@earthlink.net, (402) 325-9615 or Gary Garrett, garrett@sseb.org, (770) 242-7712. Your state POC is your ITRC resource in your state. State POC contact information is available at www.itrcweb.org by clicking on "Contacts."

Technical Team Updates

Alternative Landfill Technologies (ALT)

During 2003, Charles Johnson (Colo.) led the ALT Team through the completion of its first technical/regulatory document—*Technical and Regulatory Guidance for Design, Installation, and Monitoring of Alternative Final Landfill Covers (ALT-2)*. Written primarily for regulators, owners/operators, and consultants, ALT-2 focuses on decisions and decision processes for site evaluation, design, construction, and postclosure care of landfills using an alternative capping system.

The team—composed of representatives from the California Southwest Regional Control Board; Oklahoma, Montana, Nebraska, New Jersey, South Carolina, Kansas, Louisiana, Delaware, and Pennsylvania state environmental departments; Waste Management, Inc.; Desert Research Institute at the University of Nevada-Reno; University of Wisconsin; University of Texas at Austin; Washington Group International; Ecolotree; Allen Environmental LLC; Air Force Center for Environmental Excellence; University of Colorado; Kosec Engineering; AquAeter; the Idaho National Engineering and Environmental Laboratory; Nevada DOE Operations Office; the U.S. Environmental Protection Agency; and Geosyntec—contributed their years of experience, unique perspectives, and case study information and reviewed the latest research for this document. The document also benefited from the valuable local perspectives from community stakeholders John Chambliss and Claire Alrahwan.

Modern engineered landfills are designed and constructed to minimize or eliminate the release of constituents into the environment. Solid and hazardous waste landfills are required by federal, state, and/or local regulations to cover waste materials prior to, or as part of, final closure. These final covers are only one element of landfill systems. Any landfill system may include a liner or multiple liners, the actual waste material, a cover, run-on and run-off control features, security systems aiding in the prevention of reducing and/or eliminating human intrusion, groundwater monitoring networks, and settlement monitoring markers.

There are several documents available that provide specific construction techniques related to building landfills. Sometimes a more challenging aspect of alternative final

cover (AFC) implementation is the decision related to the project. This document provides input related to key decision steps in the permitting, design, construction, and maintenance of AFCs.

AFCs can be an integral part of any landfill system; however, the final cover component differs in both design and operational theory from conventional final covers prescribed in RCRA regulations as minimum recommended designs. AFCs have been proposed for solid, hazardous, and mixed waste landfills and, since the design is in the science and engineering, an AFC cannot be categorized, prescribed, or restricted to any specific landfill type. AFCs have been constructed and are fully operational at industrial waste, construction debris, municipal solid waste, and hazardous waste landfills. They may be used on bioreactor landfills, conventional landfills, or other types of landfills. AFCs may include, but are not limited to, asphalt covers, concrete covers, capillary barrier covers, and evapotranspiration (ET) covers. ALT-2 focuses on ET covers and the decisions associated with their successful design, construction, and long-term care.

EPA maintains a database tracking 25 alternative landfill cover demonstration projects and 11 full-scale operating facilities in 18 states. Among the 25 demonstration projects in the database are 20 solid waste/industrial waste/construction debris demonstration projects and two hazardous-waste and three mixed-waste demonstration projects. Annual rainfall associated with these 36 alternative landfill cover projects ranges from a low of approximately 3.5 inches to a high of 56 inches.

Alternative landfill covers are already in use, or the designs are approved and field testing is under way, at pre-Subtitle D unlined facilities, Subtitle D lined facilities, pre-Subtitle C unlined facilities, and Subtitle C lined facilities. Subtitle D alternative cover designs are in place or approved at industrial, municipal, and debris landfills. Alternative landfill covers have several potential benefits over conventional and regulatorily prescribed landfill covers, while being equally protective of human health and the environment. Some of the benefits include more readily available construction materials, ease of construction, more implementable quality assurance/quality control programs, and increased long-term cover integrity and stability.

The ITRC ALT Team believes that the solid and hazardous waste regulations clearly provide a mechanism to permit, design, construct, and maintain landfills with alternative cover designs.

Future additions to the ALT Team's products include bioreactors and alternative methods of postclosure care. The team developed the 2004 bioreactor scope of work and draft work plan during the Fall Meeting. For more information on this team, please contact ALT Team leader Charles Johnson at (303) 692-3348, charles.johnson@state.co.us.

Brownfields



The Brownfields Team, winner of the 2003 ITRC Outstanding Team Award, pose with their plaque. From left to right in rear are J. R. Capasso, Richard Mach, Bill Mundy, Kai Steffens, Gary Riley, David Criswell, Barry Brawley, Roger Argus, Ken Gilland, and Mike Verchick. On the front row, left to right, are Nancy Porter, Madeleine Kellam, team leader Christine Costopoulos, Annette Gatchett, Terri Smith, Ann Vega, Konstantinos Kostarelos, and Tom Stockton.

For its superior work this year, the Brownfields Team received the Outstanding Team Award at the ITRC Fall Meeting. One element of being outstanding was coordinating ITRC participation at Brownfields 2003, the premier annual brownfields conference that drew more than 4,000 attendees to Portland, Ore. during late October this year. Christine Costopoulos (N.Y.), Brownfields Team leader, moderated a session that highlighted how several ITRC teams are addressing issues relevant to reclaiming contaminated sites. Megan Cambridge (Calif.) and Gary Riley (Calif.) represented the Brownfields Team and spoke about the team's first document, *Vapor Intrusion Issues at Brownfield Sites*; Tom O'Neill (N.J.) spoke about the Remediation Process Optimization Team; and Bob Mueller, new ITRC cochair and coleader of several ITRC teams, shared some redevelopment success stories that highlighted how phytotechnology and other "green" technologies can contribute to new recreational uses for previously contaminated sites.

The team is very close to publishing its first product, an overview document called *Vapor Intrusion Issues at Brownfield Sites*. The team sent the document to external peer reviewers and is now working to incorporate their comments. *Vapor Intrusion Issues at Brownfield Sites*, which will serve as a resource for stakeholders involved with redevelopment projects, presents an overview of vapor intrusion, the type of contaminants that may have

vapor intrusion potential, the potential of brownfield sites to have indoor air exposure from vapor intrusion, and the steps to take to control and mitigate potential exposures. Ken Gilland of the Research Triangle Institute is the lead on the vapor intrusion document.

The team continues to review guidance that EPA is developing as part of the U.S./German Bilateral Working Group on the Site-Specific Management Approach and Redevelopment Tools Resource (SMARTresource). The team, which identified model projects for SMARTresource, is contributing to the document by including state-specific information, selecting beta test sites, and drafting SMART training materials. The team's input and comments have been incorporated into the document and into SMARTe, which is an electronic decision support tool. Ann Vega of EPA is the lead on the SMART effort.

The team is also working with federal partners to facilitate federal property transfers under Base Realignment and Closure (BRAC). Specifically, the team will select criteria for case study sites to include in a BRAC case study document. Christine Costopoulos of New York leads the Brownfields Team and can be reached at (518) 402-9711, cjcostop@gw.dec.state.ny.us.

Constructed Wetlands

Manmade wetlands can serve two purposes:

1. As a treatment technology for a variety of contaminants in a variety of applications.
2. As a replacement, restoration, or mitigation wetlands for wetlands lost during property development.

The first use offers treatment of contaminants, and the second offers renewed or new habitat. To date, few instances bring the two objectives together; however, ITRC has proposed to investigate the potential to integrate these two objectives. The ITRC Wetlands Team, along with the ITRC Alternative Landfill Technologies Team, has joined a partnership with the Wildlife Habitat Council (see article, page 3) and developed a white paper titled "Building the Case For Ecological Enhancements," including case studies. The process of developing the white paper has joined industry representatives, state and federal environmental regulators, community stakeholders, and habitat and ecology specialists into a team to openly discuss how green technologies can be used to combine environmental cleanup objectives with enhanced habitat for wildlife. The ITRC proposal, called "Ecological Enhancements within the Design, Construction, and Monitoring of Remediation Systems," includes this definition:

An ecological enhancement modifies a site to increase/improve habitat for plants and animals while protecting human health and the environment. An ecological enhancement can include natural remedial technologies and/or represent an end use that restores/increases the ecological value of the land.

Integral to this project is the final printing and distribution in December 2003 of the Wetlands Team document *Technical and Regulatory Guidance for Constructed Treatment Wetlands*. Internet-based training on this guidance will be delivered during 2004.

The Mitigation Wetlands Team continues to revise the decision tree and supporting documentation for characterizing a wetlands-impacted area, establishing mitigation goals, and designing a wetlands construction plan. This guidance will be completed in early 2004. For more information on constructed treatment wetlands or mitigation wetlands, contact team leader Dib Goswami (Wash.) at (509) 736-3015, dgos461@ecy.wa.gov. Another team leader is being sought to replace Bob Mueller, who is now serving as cochair of the ITRC Board of Advisors.

Contaminated Sediments

The Contaminated Sediments Team continues to work on an overview document, which will serve as a comprehensive review of the technical elements in sediment site assessment and remedy selection. The challenge for the team is that, while EPA estimates that approximately 10% of the sediment underlying the nation's waterways is sufficiently contaminated with toxic compounds to pose risks to fish, humans, and wildlife that eat fish, there are no uniform standards for characterizing and managing contaminated sediments. The characterization section of the overview document will present information on conceptual site models, data quality objectives, risk assessment, and the Triad Approach, including discussions on types of screening levels, rapid characterization techniques, sampling methods, and laboratory issues. The document will also address some remediation alternatives for treating contaminated sediments, including monitored natural recovery, capping, removal, and a few innovative technologies. Richard DeWan (N.J.) and Brad Helland (Wash.) lead the Sediments Team. Reach Rich at (609) 984-4426, richard.dewan@dep.state.nj.us. Brad can be reached at (425) 649-7138, bhel461@ecy.wa.gov.

Dense Nonaqueous Phase Liquids (DNAPLs)

The DNAPLs Team's newest document is its fourth product—*Introduction to Characterizing Sites Contaminated with DNAPLs* (DNAPLs-4, September 2003). DNAPLs-4 discusses scientific approaches and strategies used to characterize sites that are known or suspected to be contaminat-

ed with dense nonaqueous-phase liquids (DNAPLs). Written to introduce the fundamental concepts of site characterization strategies as they relate to DNAPLs, the document is meant for readers familiar with the principles of contaminant hydrogeology and conventional characterization approaches but perhaps less well versed in the issues surrounding the characterization of sites contaminated with DNAPLs. As a primer for characterizing sites contaminated with DNAPLs, DNAPLs-4 provides some tools for identifying the presence of DNAPL in the subsurface. It does not attempt to fully discuss and describe the physics and complex behavior of DNAPL flow and fate in the subsurface. That information is readily available in the peer-reviewed scientific literature. The document includes references to literature describing the multiphase fluid flow concepts required to understand DNAPL physics. The DNAPLs Team thanks Michael Smith (Vt.) for spearheading the effort to develop this latest product of the DNAPLs Team.

The team continues to present periodic Internet-based training on its third product—*Technical and Regulatory Guidance for Surfactant/Cosolvent Flushing of DNAPL Source Zones* (DNAPLs-3, April 2003). The team has now turned its attention to its next document—*Strategies for Monitoring the Performance of DNAPL Source Zone Remedies*, which is scheduled for publication in June 2004. Eric Hausamann (N.Y.) leads the DNAPLs Team and can be reached at (518) 402-9759, eghausam@gw.dec.state.ny.us.

Diffusion Samplers (DS)

The Diffusion Samplers Team has developed a new database devoted to passive samplers, which is available on the ITRC Diffusion Sampler Information Center Web site (<http://ds.itrcweb.org>). The database's search capabilities enable the user to identify sites where passive samplers have been tested or implemented, based upon user-selected criteria such as geography, target analytes, or type of sampler. The database also allows for the remote entry of new case studies via the Internet. The DS Team plans that this database will provide current data on the implementation of passive samplers around the country.

The ITRC technical/regulatory guidance document for diffusion samplers is in the home stretch! Responses to POC comments are being drafted, and the document will then go for final editing. The team expects to publish this document by the end of 2003.

Plans are under way to field-test diffusion samplers for metals and other non-VOC compounds. The testing will provide side-by-side comparisons of a variety of sampling methods.

During DS team meetings in Monterey, the team prepared responses to external peer review comments on the technical/regulatory guidance document, heard informative presentations on new concepts of low-sampling methods, and learned about some novel sampling devices. Copies of most presentations can be downloaded from the Diffusion Sampler Information Center Web site. Reach DS Team leader George Nicholas (N.J.) at (609) 984-6565, george.nicholas@dep.state.nj.us.

In Situ Bioremediation (ISB)

The ISB Team has joined forces with the DNAPLs Team to develop guidance on using a systematic ISB approach to treat chlorinated ethene DNAPLs. A *Systematic Approach to In Situ Bioremediation in Groundwater for Chlorinated Ethene DNAPLs* will present a decision tree for reviewing, planning, evaluating, and approving ISB systems for DNAPLs in the saturated subsurface. The systematic approach will guide site owners, consultants, and regulators in making wise decisions about the use of ISB technologies to either directly treat chlorinated ethene DNAPLs or follow up source-term treatment. The guidance will evaluate several source-term treatments in terms of ISB conditions: thermal, cosolvent flushing, and physical removal. Each of these applications will be described in a decision tree pathway for the systematic approach. The ISB Internet training team has successfully presented three Internet-based training courses this year.

The ISB team had a very successful and productive team meeting during the Fall Meeting in Monterey. Part of the meeting focused on continued development of the systematic approach to ISB and DNAPLs. The team expects to complete this guidance by the end of the year, making it available on ITRC's Web site in early 2004. During the second half of the meeting, the ISB Team discussed partnering with a DOE team to focus on monitored natural attenuation (MNA) and enhanced passive remediation (EPR). The ISB Team provided peer review and comments to the DOE team's initial document, which discusses advances in the science and understanding of attenuation processes and addresses how to improve monitoring methodologies and how to provide a regulatory framework to deploy the new methodologies and understanding of MNA/EPR. New ISB projects are planned by ITRC for 2004 with the team moving forward with the DOE team and another team addressing the issues related to ISB as a source-term treatment for chlorinated ethene DNAPLs. Questions should be directed to ISB Team leader Bart Faris (N.M.), (505) 841-9466, bart_faris@nmenv.state.nm.us.

MTBE-Contaminated Groundwater

The MTBE Team continues to provide innovative technology support to states involved in managing releases of MTBE and other fuel oxygenates to the environment. Additionally, the team provides a forum for open dialogue among state regulators, federal partners, industry, and community stakeholders on a variety of fuel oxygenate-related issues. As the team nears the end of its first full year, members are busy preparing two technology products and a much-anticipated classroom training course. Team leader Fred McGarry (N.H.) says this year has been extremely rewarding though completely tiring for everyone involved. MTBE has suddenly become one of the hottest topics in and out of Washington, D.C. as members of Congress continue to debate the future use of MTBE as a fuel oxygenate.

The MTBE Team met twice during the most recent quarter. During the Fall Meeting, attendees heard presentations by Joseph O'Connell, president of Environmental Resolutions, Inc., on "Fluidized Bed Bioreactors for Treatment of TBA and MTBE in Groundwater or Drinking Water." A second presentation on "Microbiology and Enzymology of Aerobic MTBE and TBA Oxidation: The NCSU Perspective" was provided by Mike Hyman, a new MTBE Team member and a professor in the Microbiology Department at N.C. State University in Raleigh. Both presentations are available on the MTBE Team page (www.itrcweb.org).

The second meeting on October 27 and 28 was actually a dry run for the upcoming "MTBE & TBA Classroom Training: Comprehensive Site Assessment and Successful Groundwater Remediation" course. A small group of New Hampshire state employees attended the event, providing valuable feedback to course developers. MTBE training coordinator Joe Haas (N.Y.) is busy incorporating comments and preparing materials for the invitation-only event to be held December 16–18, 2003 on Long Island, N.Y. The team plans on offering additional courses in 2004 and is busy securing industry funding. For more information about the training or general MTBE Team activities, contact Fred McGarry, (603) 271-4978, fmcgarry@des.state.nh.us.

Permeable Reactive Barriers (PRBs)

During the Fall Meeting in Monterey, the team met to revise the 2004 work plan based upon an anticipated reduction in the team's budget. The team revised the scope of work for 2004, resulting in an abbreviated work product both for the Web site update and the guidance document development. The update to the Web site will now focus on revising the permeable reactive barriers public page to include one page of links to other permeable reactive barrier resources. The guidance document on permeable reactive barriers will address new developments in permeable reactive barriers

since the team's last guidance document. However, due to funding considerations, this document will probably not provide detailed information on noniron-based treatment media. Even with the reduced scope of work, the team was not sure the funding would be sufficient to complete the work products. The team does have a committed membership and at the Monterey meeting did secure assistance from both the Navy and EPA in developing the proposed document. Some members of the team attended the Remediation Technologies Development Forum, Permeable Reactive Barriers Action Team Meeting in Niagara Falls, N.Y. on October 15–16, 2003. Information and resources obtained at the RTDF meeting will be valuable in developing the team's guidance document. Team leader Matt Turner (N.J.) can be reached at (609) 984-1742, matthew.turner@dep.state.nj.us.

Radionuclides (Rads)

The Radionuclides Team continues to work on two documents and an Internet-based training session. At the ITRC Fall Meeting, the team reviewed a draft of *Real-Time Data Collection for Radionuclides* and the draft for *Technology and Implementation Challenges for Long-Term Stewardship at Radioactive Sites*. New timelines were developed for both the real-time data collection and long-term stewardship subteams to complete draft final documents by end of the year.

The team offered an Internet-based training course entitled "Radiation Risk Assessment: Updates and Tools" on July 19 and October 9. These sessions were well attended by close to 180 participants per course. More Internet-based training sessions may be offered next year, in addition to partnering with EPA to develop a classroom training of the same course.

In September, the Rads Team provided comments on DOE's risk-based end state vision implementation plan, or "Corporate Strategy." The team has been developing next year's work plan and will continue closely working with DOE's offices of Environmental Management and Legacy Management, citizens advisory boards, the ECOS long-term stewardship effort, and EPA Superfund. The team is planning to present papers at the DOE TIE (Technology Information Exchange) conference. Rads Team coleader Tom Schneider can be reached at (937) 285-6466, tom.schneider@epa.state.oh.us, and coleader Carl Spreng can be reached at (303) 692-3358, carl.spreng@state.co.us.

Remediation Process Optimization (RPO)

The Remediation Process Optimization Team unveiled its new RPO brochure at the Fall Meeting in Monterey. The brochure highlights what RPO is and who is conducting optimization, as well as providing examples of successful RPOs. The brochure was written as a handy reference to help state regulators understand how optimization can benefit states that will eventually inherit responsibility for fund-

lead Superfund sites from EPA. Copies of the brochure, which are available from RPO Team leader Tom O'Neill, are posted on the ITRC Web site and will be distributed at upcoming national conferences.

At the Fall Meeting, team members continued to work in small groups to draft sections of the RPO technical/regulatory guidance document. A lot of progress was made on completing the first draft of the document, which is now scheduled to be submitted for external review early in 2004. The team also began preparations for determining the type of Internet-based and classroom training that the team would be interested in providing upon completion of the technical/regulatory guidance document. At the team meeting, federal government team members presented overviews of optimization training classes so that team members could get an understanding of what is currently available. Copies of those training materials are posted on the RPO Team Web page.

The team has planned a very busy 2004 schedule, with publishing its technical/regulatory document, cosponsoring a federal optimization conference in June 2004, and rolling out both Internet-based and classroom training. The RPO Team's upcoming activities include completion of the draft report and monthly conference calls to update members on the status of the document and to determine training requirements. In late October, team leader Tom O'Neill attended the Brownfields 2003 Conference in Portland, Ore., where he made a presentation on how RPO can be utilized at brownfields sites. The RPO Team reinforced this theme with a poster session at Brownfields 2003.

The team welcomes comments from individuals who have conducted optimization studies during cleanup, as well as any questions related to RPO. Please contact Tom O'Neill at (609) 292-2150, toneill@dep.state.nj.us for more information.

Risk Assessment Resources (Risk)

The Risk Team provided comments to the EPA Region 6 Corrective Action Strategy, which the region is revising. Region 6 provided its take on the team's comments at the Fall Meeting. The Risk Team also provided, like the Rads Team did, comments to improve DOE's risk-based end state vision implementation plan, or "Corporate Strategy." Team comments were incorporated into a formal ITRC response and sent to DOE in September.

One Risk Team goal is to participate with DOE, EPA, and other federal and state agencies in bringing consistency in use of risk assessment for decision making. As part of this effort, the team is closely examining the basis of variation in risk assessment approaches among states, especially in the context of developing and using soil-screening levels

(SSLs) in soil. For this, the team continues to work with the California Center for Land Recycling, which conducted a national survey of numerical variations of SSLs. The team conducted a workshop on this topic entitled "Bringing Reality to Risk Assessment" at the Fall Meeting. Discussions during the workshop and results of an internal survey led the team to decide to develop a concept paper on this topic, with eventual development of a document as part of 2004 activities. The team wants to put the concept paper on the team Web page before the end of 2003. Risk Team members are also planning to participate in annual meetings of the Society of Risk Analysis, which will meet this year in Baltimore in December.

During the Fall Meeting, in addition to deciding its 2004 work plan, the Risk Team decided to examine newly approved proposals for ITRC teams to avoid any redundancy with Risk subteam activities. As a consequence, the Risk Team will not address items like indoor air and the proper use of the Johnson & Ettinger model, as this topic is the responsibility of a new ITRC team in 2004. The Risk Team will, however, provide the new team access to resources within state organizations, including the multidisciplinary California EPA indoor-air working group. Risk Team leader Steve DiZio (Calif.) can be reached at (916) 255-6634, sdizio@dtsc.ca.gov.

Sampling, Characterization, and Monitoring (SCM)

The SCM Team is making good progress on two documents. *The Triad Approach: A New Paradigm for Environmental Project Management* has been sent to POCs for a concurrence review. This technical/regulatory guidance for applying the Triad approach to environmental projects is atypical for ITRC in that it does not report on a technology per se but instead introduces concepts for conducting environmental work that can increase effectiveness and quality and save project money. The guidance demonstrates a logical approach for integrating the Triad approach's three concepts: better investigation preparation (systematic project planning), greater flexibility while performing field work (dynamic work strategies), and greater use of field-generated data (real-time measurement technologies). Uniting all these concepts is the need to understand and manage uncertainties that affect decision making. The SCM Team created this document as a first step to stimulate understanding and discussion of the ideas embodied in the Triad approach. Internet-based and classroom training is expected to follow as the next step in technology transfer of Triad approach concepts.

During the Fall Meeting, SCM Team members worked to flesh out their draft on direct-push wells. The direct-push wells subteam is creating *The Use of Direct-Push Wells*

Technology for Long-Term Environmental Monitoring in Groundwater Investigation to help site owners, consultants, regulators, and public stakeholders made informed decisions regarding the use of direct-push wells for long-term monitoring and determining static groundwater levels. The document will provide an objective evaluation of this technology, which has been an established alternative to conventionally drilled wells for the past 10–15 years and continues to gain acceptance. The document will present comparative data between direct-push and conventionally drilled wells in the form of multiple case studies as they relate to representative contaminant detection and water level measurements. Team leader Stu Nagourney (N.J.) can be reached at (609) 292-4945, stu.nagourney@dep.state.nj.us.

Small Arms Firing Range (SMART)

The Small Arms Firing Range Team completed Internet-based training on “Characterization and Remediation of Soils at Closed Small Arms Firing Ranges” on September 11 and November 20, 2003. The training will continue into 2004, along with a new training on “Environmental Stewardship Using Best Management Practices at Active Small Arms Firing Ranges,” which addresses maintenance and management of lead at operating small arms firing ranges.

For those states that have commercial or governmental firing ranges but do not offer guidance for their environmental stewardship, the SMART Team is consolidating information from a number of sources, such as EPA, the National Shooting Sports Foundation, the Association of European Manufacturers of Sporting Ammunition, Army Environmental Center, Massachusetts, and Florida into a single guidance, including a logic diagram for developing an environmental management plan. The team also intends to develop a template for governmental technical assistance programs and offer trainings to those states interested in offering technical assistance to range owners and operators, encouraging voluntary environmental stewardship. The team expects interest within states to vary. To ensure up-to-date information on state environmental agencies’ interest and current or planned involvement in environmental stewardship of active small arms firing ranges, the team needs input from states on the following questions:

1. Has your agency been involved with the environmental management of an active (open) small arms range?
2. Who in your agency or other state agency deals with environmental topics at active (open) small arms firing ranges?
3. Has your agency been involved with the environmental management of an inactive (closing or closed) small arms range?

4. Who in your agency or other state agency deals with environmental topics at inactive (closing or closed) small arms firing ranges?
5. Are you aware of the various best management practices (BMPs) documents that were developed for environmental management of small arms ranges?
6. Would you like to receive more information on these BMPs?
7. Would you like to receive more information on innovative preventive or remediation technologies for active or closing small arms firing ranges?
8. Are you aware of the technology assistance programs developed by US-EPA, MA-DEP or FL-DEP?
9. On a scale of 1 to 10, 10 being the highest, how would you rate your agency’s concern about the environmental management of small arms ranges?

The goal of these questions is to identify points of contact within state agencies so that the SMART Team may share information on environmental management of small arms firing ranges and ascertain what experience states have had with environmental management of small arms firing ranges.

However, the team is extremely interested in anyone who owns, manages, or has any other interest in small arms firing ranges and would appreciate information or questions from anyone in the industry. The team has had a number of calls from local and state law enforcement agencies and strives to make contact with what has become a nontraditional audience for ITRC. If you have a few minutes, please contact team leader Dib Goswami (Wash.) at (509) 736-3015, dgos461@ecy.wa.gov. Another team leader is being sought to replace Bob Mueller, who is now serving as cochair of the ITRC Board of Advisors. Reach program advisor Steve Hill at (208) 653-2512, srhill1@mindspring.com.

Unexploded Ordnance (UXO)

Using current technologies, the cost of identifying and disposing of UXO in the United States is estimated at more than \$100 billion. New technologies and regulatory acceptance of these technologies will be required to reduce the cost of site characterization and cleanup. Because of the importance of these issues, the UXO Team devoted one of its meeting days at the Fall Meeting to technology-related discussions, with team members exchanging information, insights, and ideas from a wide variety of perspectives.

The team’s technology focus day featured presentations on SERDP (Strategic Environmental Research and Development Program) and ESTCP (Environmental Security Technology Certification Program), which are joint DoD, DOE, and EPA programs and managed by DoD.

SERDP is a science and technology program that has funded research and development efforts for new UXO technologies capable of improving UXO detection and discrimination. ESTCP is the demonstration and validation program for these new technologies.

Dr. Anne Andrews, UXO program manager for SERDP/ESTCP, presented an overview of the SERDP/ESTCP program to the UXO Team, followed by presentations from three principal investigators on their projects: airborne multisensor systems, improved discrimination using magnetic and electromagnetic induction sensors, and detection and characterization using multicomponent time-domain electromagnetic (TEM) induction.

The annual SERDP/ESTCP conference *Partners in Environmental Technology Technical Symposium and Workshop* in early December in Washington, D.C. provided the UXO Team with the opportunity to present a poster on its soon-to-be-published document *Munitions Response Historical Records Review* (MR HRR). This document, underwent final revisions based on comments received from DoD and will be published in hard copy and CD formats late this year. In addition to the poster presentation, the SERDP/ESTCP program graciously provided meeting space during the conference for the UXO Team to continue the editing process on its second document, *Geophysical Prove-Outs for Munitions Response Projects*.

In addition to working on documents, the team has presented its last scheduled classroom UXO Basic Training course. Cosponsored by EPA and the Texas Commission on Environmental Quality, this class drew an audience of 120 participants in Austin, Tex. on October 28–29. A record number of state regulators, DoD, industry, and stakeholder participants took this course to learn the fundamentals of regulatory issues related to cleanup, ordnance recognition, UXO technologies and the basics of site investigation and site remediation. UXO Team coleaders are Jeff Swanson (Colo.), who can be reached at (303) 692-3416, jeffrey.swanson@state.co.us, and Jennifer Roberts (Alaska), who can be reached at (907) 269-7553, jennifer_roberts@dec.state.ak.us.

Upcoming meetings

January 20–22

Team Leader Kick-Off Meeting (Denver, Colo.)

Week of February 16th

ITRC Board Retreat (Washington, D.C.)

March 22–24

ITRC Spring Meeting (Atlanta, Ga.)



Outgoing Board of Advisors members Paul Hadley, state engagement coordinator (left), and Brian Griffin, board cochair (above), were recognized by board cochair Ken Taylor for their contributions to ITRC success.



Team members from the DNAPLs (above and below), State Engagement (right), and the Remediation Process Optimization (below right) teams meet during working sessions at the Fall Meeting.





Rick Tomlinson, former program manager (shown here with Aimee Houghton), is honored for guiding ITRC through a period of rapid growth.



Carolyn Hanson, Mary Yelken, and Brad Helland consult a chart to find their tables for the POC-led breakfast.



Jeff Swanson, coleader of the UXO Team, addresses his team. Also pictured is Stacey Kingsbury, UXO program adviser.

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