

FEDERAL REMEDIATION TECHNOLOGIES ROUNDTABLE MEETING
Crystal City, Virginia
June 19, 2002

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Arlington, Virginia
June 19, 2002

ACTION ITEMS

- ▶ Agencies agreed to get their feedback to John Kingscott (U.S. EPA/TIO) on the list of remediation technology analysis and design documents that was distributed. Kingscott agreed to further investigate the inclusion of ITRC documents on this list.
- ▶ Individuals with updated information for the screening matrix should contact Rick Williams.
- ▶ Mr. Owendoff committed to send TIO maps of DOE's biggest problem sites by July 15.

WELCOME/OPENING REMARKS

Walt Kovalick welcomed the attendees and opened the meeting of the Federal Remediation Technologies Roundtable (FRTR) with introductions and an overview of the agenda.

ROUNDTABLE POLICY AND OPERATION

Cost and Performance Status Report

John Kingscott (U.S. EPA/TIO) provided an update on the Roundtable's Cost and Performance Remediation Case Studies database. Thirty-nine new case studies describing the cost and performance of remediation at hazardous waste sites have been added to the FRTR Cost and Performance database ([link to it from www.frtr.gov](http://www.frtr.gov)), resulting in a total of 313 remediation case studies available in the database. These case studies cover a wide range of technology types and contaminants, and provide information about the site background and hydrogeology, a description of the technology design and operation, cost and performance data, information about lessons learned from the project, and points of contact. Every month, the database averages 3,500 visits that include at least one case study search.

New Initiatives Beyond Case Studies

Mr. Kingscott said that the Roundtable also has developed 110 case studies on site characterization and monitoring, five case studies on treatment optimization, and seven case studies on long-term monitoring optimization. Kingscott then provided information on the Roundtable's efforts for optimizing remediation systems, the stages of technology development, and the Roundtable's Technology Assessment Reports. He ended his presentation by noting that the Roundtable has four new products: 1) a CD-ROM that includes all of the remediation, site characterization and monitoring, treatment optimization, and long-term monitoring optimization case studies; Volume 6 of the Abstracts Report; a fact sheet; and information on the optimization website. As for next steps, Kingscott requests that the Roundtable's member agencies comment on the technology analysis and design reports in early July. The Roundtable will deliver the abstracts, fact sheet, and CD-Rom soon, and the agencies were encouraged to distribute the fact sheet and CD-ROM to their members and at various events.

Questions and Answers

In response to a question from Mr. Owendoff about why ITRC documents are not included on the CD-ROM, Kingscott said that it may make sense to add ITRC documents to the CD-ROM in the future

after further review, but not at this time. Maj. Cornell said that while the ITRC documents could be included, they only address bench- and small-scale projects, and do not address larger scale projects. Mr. Owendoff noted that the ITRC develops design manuals that could be included on the CD-ROM; if not, the website links to these documents could be included.

New and Improved FRTR Website

Kelly Madalinski (U.S. EPA/TIO) provided an update on the changes to the FRTR web site. The web site provides information on the Roundtable's efforts and activities and continues to grow. It is maintained by the Roundtable members and had 185,000 unique visits in 2001.

Currently, the website is being redesigned and TIO is looking for input from Roundtable members as to how they want their agencies to be linked from the new website. TIO expects the new design to be available by the end of summer.

Revised Screening Matrix

Rick Williams (AEC) said that AEC is in the process of updating the Screening Matrix, but needs help from the Roundtable members to do it properly. He emphasized that the matrix is an important tool, and that Roundtable members need to take the time to provide needed information.

DNAPL Strategy Developments

Walt Kovalick said that discussions among agencies for developing DNAPL strategies are continuing. These discussions include concepts of coordination of demonstrations and field scale-projects, sharing of information about policy developments and research and development issues, and outreach. Kovalick added that there have been some discussions searching for source term technologies and demonstrations of new DNAPL technologies, but these did not lead to enough data.

SERDP/ESTCP DNAPL Update

Andrea Leeson (SERDP) presented an update on SERDP/ESTSP DNAPL projects. In FY 2002, SERDP started four new projects:

- the development of assessment tools to evaluate the benefits of DNAPL source zone treatment;
- the development of characterization methods and prediction tools to evaluate mass transfer from entrapped DNAPL sources undergoing remediation;
- an experimental and modeling assessment of the benefits of partial source removal at DNAPL sites; and
- the development of a support system to evaluate the effectiveness and cost of source zone treatment.

In August 2001, SERDP/ESTCP held a two-day chlorinated solvents workshop with 20 field experts to evaluate research needs for chlorinated solvent site cleanup. The purpose of the meeting was to develop a strategic plan to guide research & technology development over the next five to 10 years. Key findings from this meeting included a need for:

- focusing on source zone treatment;
- developing better performance assessment tools;

- developing tools to measure mass and mass release rates;
- focusing on existing technologies;
- focusing on thermal and bioremediation technologies;
- evaluating available existing data; and
- increasing technology transfer efforts.

The proceedings from this meeting are available in PDF format online at www.serdp.org/news/other_events/2001/chlorsolv/chlorsolvcleanup.pdf or www.estcp.org/documents/techdocs/chlorsolvecleanup.pdf. The meeting also will be featured in an article in ES&T.

SERDP and ESTCP's FY 2003 Statement of Needs (SONs) include:

- DNAPL Source Zone Delineation & Characterization (SERDP)
- Diagnostic Procedures to Evaluate Performance at Chlorinated Solvent-Contaminated Sites (SERDP)
- Assessment of Long-Term Sustainability of Monitored Natural Attenuation of Chlorinated Solvents (SERDP)
- DNAPL Treatment Assessment (ESTCP)

For SERDP's SONs, SERDP has received full proposals and hopes to complete its review of these proposal within two weeks. For ESTCP's SONs, ESTCP has received DoD's full proposals and has requested additional full proposals from the private sector and other federal agencies. ESTCP hopes to complete its review process for these proposals in August 2002.

Questions and Answers

In response to a question about what the final products will be from the research proposals, Ms. Leeson said that SERDP plans to form an expert panel to review and guide the projects.

DNAPL Activities Update

Jim Cummings (US EPA/TIO) briefed the Roundtable on progress under the FRTR DNAPL Initiative—the effort to design and implement an expedited technology development process for particular remediation problems. The Initiative is engaged in developing a model process based on a set of promising technologies for remediating DNAPLs in the subsurface.

Mr. Cummings announced the availability of an *in situ* thermal technologies database on CLU-IN, the development by ICW and USACE of an *in situ* oxidation database that will include full-scale case studies, technology summaries, and tallies of technologies, and the development of a surfactant and co-solvent database that is scheduled to be up and running during the first quarter of 2003. Mr. Cummings then updated the group on the development of *in situ* treatment documents. An *in situ* thermal document is under development with initial funding by USACE and TIO, a surfactants document was recently published by the U.S. Navy, and two *in situ* oxidation documents—one published by SERDP in *Technology Status Review* in November 1999 and another published by DOE in January 2000 titled “Guidance for In Situ Chemical Oxidation at Contaminated Sites: Technology Overview with a Focus on Permanganate”—are available.

Mr. Cummings then noted that panel discussions with participants from SERDP/ESTCP, EPA/National Research Council (NRC), the Army Environmental Center (AEC), and Battelle have been held (or are scheduled) to discuss the results of remediation using partial source removal techniques. Preliminary results of these discussions indicate that additional data is needed before determinations can be made about the effectiveness and future cost savings of partial source removal. However, TIO's efforts to gather data on the behavior of residual plumes following active attention to the source term have been frustrating. Specifically, only a limited number of sites have actively addressed source term that affect groundwater, and there are questions regarding the duration and adequacy of the data that has been collected. In addition, federal agencies are not accustomed to managing on the basis of aggregate performance information. To address this, TIO is planning to follow-up with its Regions regarding 70 candidate sites, continue work with the Interstate Technology and Regulatory Council (ITRC) and individual states, and have discussions with AFCEE, AEC, the Navy, and DOE Pinellas.

Next, Mr. Cummings provided a progress report on the Visalia Steam Remediation Project that included graphs showing the concentrations of pentachlorophenol over time at various wells at the site.

Questions and Answers

In response to a question from Eric Hausamann (NY State Dept. of Conservation) about whether TIO has a checklist that participants could use to help TIO gather data, Cummings said that much of the data TIO is looking for is not yet available.

Mr. Owendoff said that he would like to receive a data prioritization list from TIO so he could provide TIO with the proper data from DOE sites. He added that he could provide TIO with a comprehensive list of data for plumes at all DOE sites, or at least the sites where DOE has the biggest problems. Mr. Cummings said that EPA would be interested in data only from sites where it is known that the source term has been addressed, but that this is difficult to obtain.

Maj. Cornell said that getting such data from Air Force sites would require an extensive effort because the data collection efforts by Air Force sites are decentralized. He added that he thinks that data collection at big sites would require too much time, and that data collection from smaller sites may be better suited to EPA's current effort.

National Research Council Panel

Laurie Haines (AEC) provided an overview of AEC's efforts to review data from complex sites with source terms. She explained that over the last three to five years, AEC has conducted independent technical reviews for individual projects, especially projects that focused on complex sites with complex problems. These reviews made AEC question whether certain technologies would work at sites where source terms had been removed. To address this concern, AEC asked the NRC to form a panel to provide unbiased recommendations about whether natural attenuation (through absorption or accommodation) can take over at sites where the source term has been removed. As part of this effort, AEC asked the NRC to answer questions about how to monitor and characterize such sites.

Ms. Haines said that the NRC usually will ask who you want on your panel, but that once the panel is formed, you have no control over what the panel will do. Therefore, it is very important to clearly define your scope of work before the panel is formed. Skip Chamberlain (U.S. DOE) suggested that

when using an NRC panel, it may be better to develop a reduced scope of work so that the panel can more specifically address your issue.

UPDATE ON INTERSTATE TECHNOLOGY AND REGULATORY COUNCIL (ITRC) STRATEGY AND ACTIVITIES

Regulatory Acceptance for New Solutions

Ken Taylor, ITRC Co-Chair, presented an overview of the ITRC. The ITRC is a unique forum that works to obtain regulatory acceptance for new solutions to environmental problems. The ITRC produces products that are focused on implementation at the working level where the regulator interfaces with the regulated community. The ITRC uses teams to create technical capacity, identify areas of consensus, and build a network of trust. Participants on the ITRC include state regulators, public stakeholders, academia, federal agencies (EPA, DOE, and DOD), industry representatives, and co-sponsors (Environmental Council of States, Western Governor's Association, and the Southern States Energy Board).

The ITRC was founded in 1995 with 10 states, two technical teams, and 30 team members, and has grown to 40 states, 14 technical teams, and 370 members in 2002. In 2002, the ITRC produced 40 guidance documents and trained 10,000 people throughout the United States. As part of its training program, the ITRC uses the internet to train a wide spectrum of professionals in the marketplace. In the future, the ITRC plans to continue to work collaboratively with its federal partners to expedite regulatory approval, expand federal participation in its technical teams and training, and incorporate federal feedback on project prioritization into the ITRC five-year-plan decision making process.

Questions and Answers

In response to a question from Mr. Kovalick, Mr. Taylor said that the State of South Carolina is represented by a few personnel on various teams and has participated in ITRC training. These representatives have said that they have been exposed to issues through the ITRC that they probably would never have been exposed to. In response to a question from Joe Gailano (USACE-WES) about training modules, Mr. Taylor said that the ITRC Teams generally produce guidance documents first and then develops training modules.

ITRC DNAPLs Team

Eric Hausamann, ITRC DNAPLs Team Leader, presented an overview of the DNAPLs Team. The Team currently has 50 members and three subteams that address: 1) thermal remediation, 2) surfactant and co-solvent flushing; and 3) characterization. The team's mission is to educate regulators and decision-makers about the "DNAPL Challenge" while highlighting the potential benefits of DNAPL mass removal.

The DNAPLs team was formed in 1995 with field practitioners to study the problems with DNAPLs. These problems include: DNAPLs migrating downward along least resistant paths into fractures and soil microstructures; difficulties with detecting and characterizing DNAPLs via borings or wells; difficulties with eliminating DNAPLs because they are recalcitrant to natural attenuation/biodegradation and continually contaminate ground water; and difficulties with recovering

DNAPLs via pumping or vapor extraction. To address these problems, the team has identified three possible scenarios: let nature take its course with natural attenuation and monitoring; contain the source with pump and treat, enhanced natural attenuation, permeable reactive barrier walls, and/or sheet pile or slurry walls; or reduce the source using thermal, chemical, or biological treatment.

To date, the team has developed two products: "Technology Overview DNAPLs: Review of Emerging Characterization and Remediation Technologies" (June 2000) and "Regulatory Overview DNAPL Source Reduction: Facing the Challenge (April 2002). The Team's future plans include publishing three guidance documents, which are on track for delivery in early 2003; following and documenting upcoming deployments; and presenting at an EPA Technical Support Project meeting that will focus on DNAPLs in Seattle in Spring 2003 and at a DOE DNAPL Workshop in Spring 2003.

Questions and Answers

In response to a question from Walt Kovalick, Hausamann said that data on DNAPLs is available from some of the state-led sites, but since some of these cleanups were done through Voluntary Cleanup Programs, it is unclear whether the data can be published. He added that it would probably be better for EPA to not get involved in helping obtain data from these sites since some of the site managers may be wary of giving the data to EPA.

ITRC Radionuclides Team

Tom Schneider, ITRC Radionuclides Team Leader, presented an overview of the Radionuclides Team. The team was formed to facilitate the cleanup of radioactively-contaminated federal facilities by fostering dialogue between states, stakeholders, and federal agencies to increase awareness of issues and procedures at sites in other states, and encourage regulatory cooperation and share technological successes and approaches. To date, the Team has published two documents ["Radiation Reference Guide" (December 1999) and "Determining Cleanup Goals at Radioactively Contaminated Sites: Case Studies" (April 2002)], been involved in technology deployments, and presented at conferences. Its focus is on three project areas: Cleanup of Radionuclide Contaminated Sites and Radiation Risk Assessment Training; Long-Term Stewardship (LTS) Technologies; and In-Situ Radionuclide Characterization.

The Team is in the process of coordinating with EPA's Superfund Office to formulate integrated EPA-ITRC Training to provide consistency among practitioners in screening out areas on the basis of risk and facilitating cleanup using risk-prioritization. The focus of this training will be on the "RAD PRG Calculator," which was developed by EPA to calculate Preliminary Remediation Goals (PRGs). This training is expected to be available in 2003. The Team also is involved in a Long-Term Stewardship (LTS) Program, which is conducting a survey of state regulators on LTS issues with a focus on technologies to support stewardship in 2002, providing input to DOE's LTS Roadmapping project, and responding to DOE requests for reviews/comments and participation in conferences. For more information on the Radionuclides Team, go to www.itrc.org or <http://offo2.epa.state.oh.us/>.

Questions and Answers

In response to a question about putting a California representative on the Radionuclides Team, Mr. Schneider said that they definitely would be interested in adding another state representative. In

response to a question about the development of a Radionuclides Reference Guide, Mr. Schneider said that the Team is discussing this as a possibility, but that no plans for such a guide have been made and that no funding for such guide is currently available.

Federal Participant Ranking of Projects in ITRC Five Year Program Plan

Rick Tomlinson (ITRC Program Director) discussed ITRC's Project Prioritization Process. The process includes four steps: submission of proposals; evaluation of proposals; prioritization of proposals; and development of a five-year program plan.

During the first step—proposal submission—ITRC state points of contact (POC), ITRC Teams, and other interested parties develop proposals in response to specified criteria. In step 2—proposal evaluation—state POCs and federal partners evaluate projects against two categories (impact of project on multi-state deployment and influence on making multi-state deployment happen), score each proposal, and average the proposal's scores for impact and influence. In step three—proposal prioritization—the Board evaluates input from state POCs and federal partners, evaluates proposals against the impact and influence criteria, plots the results on an impact/influence grid, and uses the grid plots to determine the proposals with the highest prioritization. The proposals with the highest impact and influence scores are clear winners, and teams are formed to plan these projects immediately. In step four—development of a five-year program plan—the Board finishes its project prioritization and develops a 5-year program plan to serve as the basis for planning current and out-year projects. The ITRC uses this plan as a basis for grant submissions and budget proposals to federal partners; federal partners may use this plan to assist with budget formulation language.

ITRC Unexploded Ordinance Team

Mr. Tomlinson presented an overview of ITRC's UXO Work Team. This team was formed in 1999 at the request of state regulators and community stakeholders and is made up of state regulators, federal partners, private industry, and community representatives to provide a neutral forum for exchanging ideas about innovative OE/UXO technology. Its focus is on reducing barriers to regulatory acceptance of new solutions.

To succeed, the work team has maintained multi-state collaboration, stressed full federal partner support, encouraged industry sponsorship, enhanced tribal and community stakeholder participation, and ensured frequent communication among team members. The work team produces useful products each year.

Mr. Tomlinson explained that there are more than 2,000 OE/UXO sites across the country and that more sites are still being identified. It is estimated that 25 million acres are potentially contaminated with OE/UXO and that estimated cleanup costs will be \$100 billion. OE/UXO sites vary greatly in size and topography, and cross over many regulatory cleanup programs (e.g., BRAC, IRP, FUDS, NPL). OE/UXO contamination is significantly different from traditional environmental contamination and currently there is no agreed upon regulatory framework for cleaning up these sites.

The UXO Work Team has developed a two-day training course to educate and inform state, local, and community stakeholders on the current methods and procedures used to investigate and clean up ordnance-contaminated sites. The course includes an introduction to key OE/UXO cleanup issues

relevant to regulators, project managers, and community stakeholders and will cover the following topics: OE/UXO identification and safety; regulatory issues; OE/UXO technology; site characterization; and site remediation. The focus of the course is on technical OE/UXO cleanup issues. The course does not represent or endorse any specific state, EPA, or DoD OE/UXO policy; nor does it substitute for more comprehensive technical training required to handle and dispose of ordnance and explosives.

This two-day course was offered March 26-27, 2002, in Charleston, SC, and May 21-22, 2002, in Boston, MA. Future offerings are planned for July 2002 in Seattle and December 2002 in Monterey. A half-day version of the course will be presented September 4 in Orlando, FL, in conjunction with the UXO/Countermine Forum. The Work Team has plans to offer the course 2-4 times in 2003, and intends to develop an internet version of the course in early 2003.

The Work Team plans to release in December 2002 an "Ordnance & Explosives (OE) Historical Records Document." This document will provide guidance for a reviewer in conducting or assessing the adequacy of an OE Historical Records Evaluation of property potentially impacted by the use of military munitions. The Work Team also plans to release in Spring 2003 a "Geophysical Prove-Out Document," which will assist state regulators and community stakeholders in understanding the critical aspects of OE/UXO/MEC site characterization.

Questions and Answers

In response to a question, Tomlinson said that the Work Team focuses only on inactive ranges at this time.

RECENT ACTIVITIES ON CONTAMINATED SEDIMENT TOPICS

Sediment Stability Workshop

Joe Gailani, USACE-WES, provided an overview of the January 2002 Contaminated Sediments Workshop. This workshop focused on factors that control sediment stability, approaches to measure and predict sediment stability, resource requirements for assessment, and application of a rigorous, scientific method to sediment stability predictive methods. Goals included: identifying areas of consensus about sediment stability and methods for approaching sediment stability questions; discussing limitations and uncertainties of present methods and needed research; and developing sediment stability assessment guidance.

The workshop was held with a panel of five to six experts per topic area to discuss sediment stability issues. The purpose of these panel discussions was to discuss the current state-of-the-science on the issue and build consensus between the experts. Informal dialogue and informal question-and-answer sessions between attendees and panelists was encouraged. During the plenary session, the discussions touched on issues of concern, workshop goals and framework, an overview of chemical stability, and an overview of geomorphology.

At the end of the workshop, the participants were able to reach the following consensus:

- sediment stability is an integral part of remediation site assessment;
- our present understanding requires development of site-specific predictive tools;

- a rigorous, scientific method of analysis and verification should be followed for all sediment stability studies;
- proper analysis requires time, resources, and experts;
- project managers cannot assume that available tools will provide needed capabilities without modification;
- for most sites, a scientific approach can develop the needed predictive capabilities;
- applicability and/or limitations of tools will become evident from data collection, model application, and model result analysis;
- managers should be prepared to modify their approach for addressing these issues.

Issues in Assessing and Managing Contaminated Sediment Sites Workshop

Steve Ells (U.S. EPA/OERR) provided an overview of a contaminated sediments workshop that was held in Chicago, IL, June 4-5, 2002. The workshop, titled "Issues in Assessing and Managing Contaminated Sediment Sites," was co-sponsored by the USEPA and the American Chemistry Council and attended by approximately 140 people. Updates on activities were presented by representatives from EPA, USACE, industry, federal trustees, and a citizen's advocacy group.

The first day of the meeting focused on issues related to the characterization of exposure and effects from contaminated sediments. The second day of the meeting examined risk characterization issues. More than half of the meeting was devoted to questions and answers or open discussion. There was general agreement among meeting participants that it would be useful for EPA to develop fact sheets and case studies on contaminated sediments issues, as well as host additional contaminated sediments workshops.

Recommended topics for the fact sheets included:

- Performing and using sediment toxicity tests in assessing baseline ecological risks and monitoring remedy effectiveness.
- Performing and using sediment chemistry tests in assessing ecological risks and monitoring remedy effectiveness.
- Performing and using benthic assessment field studies in assessing baseline ecological risks and monitoring.
- Performing and using benthic sediment assessment factors (BSAFs) and simple food chain models in a weight of evidence approach to develop sediment cleanup goals that are protective
- Using data from sediment toxicity tests, field studies, and food chain models in a weight of evidence approach to develop sediment cleanup goals that are protective.

Superfund's Plan for Managing Contaminated Sediments

Mr. Ells next discussed Superfund's Plan for Managing Contaminated Sediments, which was issued on February 12, 2002, to help make scientifically sound and nationally consistent decisions and to establish a new Headquarters consultation process. This plan established 11 principles:

- 1) Control sources early.
- 2) Involve the community early and often.
- 3) Coordinate with states, tribes, and natural resource trustees.

- 4) Develop and refine a conceptual site model that considers sediment stability.
- 5) Use an iterative approach in a risk-based framework.
- 6) Carefully evaluate the assumptions and uncertainties associated with site characterization data and site models.
- 7) Select site-specific, project-specific, and sediment-specific risk management approaches that will achieve risk-based goals.
- 8) Ensure that sediment cleanup levels are clearly tied to risk management goals.
- 9) Maximize the effectiveness of institutional controls and recognize their limitations.
- 10) Design remedies to minimize short-term risks while achieving long-term protection.
- 11) Monitor during and after sediment remediation to assess and document remedy effectiveness.

Superfund's Contaminated Sediment Remediation Guidance Document Update

Next, Mr. Ells presented an update on Superfund's Contaminated Sediment Remediation Guidance. The comment period for this draft guidance ended early in April 2002 and comments were received from more than seven U.S. EPA regions, GLNPO, U.S. EPA/ORD, U.S. EPA/OGC, U.S. EPA/OW, three states, USACE, NOAA, Fish & Wildlife, USGS, and the Navy. In response to these comments, the draft was revised and another public draft is planned for release in August 2002 and public listening sessions are planned for September 2002.

Questions and Answers

In response to a question, Mr. Ells indicated that this guidance only addresses sediments in underwater bodies and does not include sediments in ditches or streams that dry out during parts of the year.

NEXT STEPS

During the meeting, representatives of the member-agencies were asked to vote on a preferred technical topic for the Spring 2002 FRTR meeting. The most votes went to "Optimization of Remedial Systems—New Techniques and Progress on Implementation" but there seemed to be some interest in the "Integration of Environmental Management Systems into Remediation Efforts," which was not on the ballot. Mr. Kovalick agreed to talk more about these two topics with representatives from the member agencies before deciding on the topic for the next meeting.

The meeting adjourned.