Benefits of the Interstate Technology & Regulatory Council

Documenting ITRC Success
Stories on DOD Sites

December 2004

The ITRC is a state-led coalition that promotes the use of innovative environmental technologies. ITRC consists of 43 states, the District of Columbia, multiple federal partners, industry participants, and other stakeholders, cooperating to break down barriers and reduce compliance costs, making it easier to use new technologies and helping states maximize resources. ITRC brings together a diverse mix of environmental experts and stakeholders from both the public and private sectors to broaden and deepen technical knowledge and streamline the regulation of new environmental technologies. To accomplish this, the members of the ITRC:

- Develop guidance documents and training programs intended to help regulatory staff and technology vendors in the deployment of innovative technologies.
- Establish a network of technical resources and support for implementing new ideas in their own organizations.

How is ITRC useful to the Department of Defense?

Protection of human health and protection of the environment are two of ITRC’s critical goals. Our accomplishments and success can be measured by the following as the ITRC works with DOD to reduce risk and expedite site closure:

- Assistance to the community
- Acceleration of cleanup—Cutting regulatory approval time
- Decreasing the cost of cleanup—Slashing remediation costs
- Knowledge transfer to facilitate cleanup—Finding better solutions and transferring technologies
- Building expertise industry- and nationwide
- Paving the way for new technologies
- Long-term management of cleanup sites
- Institutional innovation—Breaking down regulatory barriers

States participating in the ITRC have reported a variety of success stories that have resulted from their participation in the ITRC. This document is an overview of some of the ways ITRC participation and work products have benefited DOD. This is only a partial listing of ITRC/ DOD success stories that are occurring on a daily basis throughout the wide ITRC network. Gathering this information requires a great deal of participation from the project site management, the ITRC team members, staff and others. The following tables provide summary information of the individual examples included in this report. Detailed information on all examples included in this report can be found in the individual military branch sections, which follow this overview. Just based on this sample of success stories for the DOD organizations, over $80 Million can potentially be saved through the existence of ITRC. Feel free to contact the ITRC Program Advisor responsible for the documentation of successful use of ITRC products or networking in the cleanup activities of the DOD: Gary Garrett c/o Southern States Energy Board, 770 242 7712 or garrett@sseb.org.
DOD Participation in ITRC Classroom and Internet-based Training

ITRC also assists cleanup efforts at DOD sites by developing and presenting both classroom and internet-based training on topics grounded in expert technical team documents. Almost **350 DOD employees** have participated in ITRC training in the past twelve months including over 300 who have taken the internet-based training and almost 50 who have participated in the classroom training. Since 1999, **over 1,130 DOD participants** have taken internet-based training in 16 different subjects. Topics receiving the most participants include In Situ Chemical Oxidation; Natural Attenuation; Diffusion Sampling; SMART; and Permeable Reactive Barriers. During that same time, internet-based training has been provided to **over 18,000 participants** including representatives of DOE, EPA, state and local governments, engineering and consulting firms, site owners and others, all who have the capability of improving the knowledge base, thus leading to faster and more efficient cleanup of site contamination.

**Number of people trained** (Oct. 2003 – Sept. 2004)

<table>
<thead>
<tr>
<th>Total DOD trained through Internet:</th>
<th>303</th>
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</thead>
<tbody>
<tr>
<td>Air Force</td>
<td>43</td>
</tr>
<tr>
<td>Army</td>
<td>113</td>
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<tr>
<td>Navy</td>
<td>77</td>
</tr>
<tr>
<td>Other</td>
<td>70</td>
</tr>
</tbody>
</table>

Total DOD trained in Classroom: 41

**Facts about Department of Defense involvement in ITRC**

**Liaison to the ITRC:**

- David Asiello, ODUSD (I&E) david.asiello@osd.mil
- Maj. Jeff Cornell, SAF/IEE jeff.cornell@pentagon.af.mil
- Maj. Ivette O'Brien, HQ AFCEE/ERS ivette.obrien@books.af.mil
- Jim Dries, Assistant for Chem, Bio and Technology, Office of the Assistant Secretary of the Army for Installations and Environment James.Dries@hqda.army.mil
- David Booker, Office of the Assistant Secretary of the Army for Installations and Environment David.Booker@hqda.army.mil
- Terrence Sobecki US Army Engineer Research and Development Ctr, terry.m.sobecki@erdc.usace.army.mil
- Greg Mellema, US Army Corps of Engineers Gregory.j.mellema@usace.army.mil
- Richard Mach, NAVFAC HQ Richard.Mach@navy.mil
**Team Representation by DOD employees:**

Individual teams and their DOD representatives are listed in the Appendix (attachment). There are 83 representatives on teams who are from the Army, 52 from the Navy, and 22 from the Air Force with Board members or liaisons making up the remainder of the 169 total DOD members officially involved with ITRC. Teams that have DOD representation as either members or interested parties include: Alternative Landfill Technologies, Bioremediation of DNAPLs, Brownfields, Contaminated Sediments, Dense Non Aqueous Phase Liquids (DNAPL), Diffusion Bag Samplers, Ecological Enhancements, Enhanced Attenuation: Chlorinated Organics, In Situ Chemical Oxidation, Indoor Air, Mitigation Wetlands, MTBE and Other Oxygenates, Perchlorate, Permeable Reactive Barriers, Remedial Process Optimization, Risk Assessment Resources, Sampling, Characterization and Monitoring (SCM), Small Arms Firing Range, and Unexploded Ordnance (UXO).

In addition, ITRC teams continue to develop products and case studies in many other technical areas relevant to DOD work. ITRC documents, Decision Trees, and other information sources help save time, money, and educate those who participate. Over 42 published documents are helping solve innumerable barriers to the use of new technologies.
<table>
<thead>
<tr>
<th>Site Location</th>
<th>ITRC Document</th>
<th>Document Use Benefit</th>
<th>Technology Benefit Compared to Alternative</th>
<th>Contacts</th>
<th>See Pg.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kelly AFB TX</td>
<td>multiple</td>
<td>ITRC engagement helped restore public confidence in the technical merit of several remedial decisions confronting the community.</td>
<td>ITRC support to Kelly resulted in getting one of the USAF's biggest cleanups back on track.</td>
<td>Lt Col Jeff Cornell, USAF, 703 693 7705</td>
<td>7</td>
</tr>
<tr>
<td>McGuire, NJ</td>
<td>Triad</td>
<td>Avoid unacceptable delays at C-17 Aircraft Hangar Project</td>
<td>Completed project quickly, saved at least a year and $1.34 million; Anticipate total savings at McGuire over $37 million</td>
<td>John Pohl, <a href="mailto:john.pohl@mcguire.af.mil">john.pohl@mcguire.af.mil</a> 609 754 3495</td>
<td>7</td>
</tr>
<tr>
<td>All sites</td>
<td>DSP-3</td>
<td>Reduce cleanup time/ improve regulatory networks</td>
<td>Creates public understanding to speed up process</td>
<td>Mario Ierardi (RPA/EV), <a href="mailto:Mario.Ierardi@afrpa.pentagon.af.mil">Mario.Ierardi@afrpa.pentagon.af.mil</a> 703 696 5518</td>
<td>9</td>
</tr>
<tr>
<td>Florida AFB</td>
<td>Triad</td>
<td>Speeds up cleanup</td>
<td>Faster, more robust evaluations; Initial discussions held to get Triad process started at 3 AFBs</td>
<td>Stu Nagourney, <a href="mailto:Stu.nagourney@dep.state.nj.us">Stu.nagourney@dep.state.nj.us</a> 609 292 4945</td>
<td>9</td>
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<tr>
<td>Lackland, TX</td>
<td>SMART</td>
<td>Eliminates hauling 3500 truckloads of soil</td>
<td>Saved approximately $10 Million</td>
<td>Russell Rohne, <a href="mailto:Russell.Rohne@LACKLAND.AF.MIL">Russell.Rohne@LACKLAND.AF.MIL</a></td>
<td>9</td>
</tr>
<tr>
<td>Tyndall, FL</td>
<td>UXO</td>
<td>Develop 4-module UXO course using ITRC course material</td>
<td>Saved training development cost of $1,200 and a week of development time</td>
<td>Dave Brown, <a href="mailto:David.Brown@tyndall.af.mil">David.Brown@tyndall.af.mil</a> 850 283 6156</td>
<td>11</td>
</tr>
<tr>
<td>Center for Environ. Excellence + Defense Logistics Agency (DLA), AK</td>
<td>UXO, RPO, Diffusion Samplers</td>
<td>Accomplished closure at several Alaska AFB sites (Eielson, Galena, King Salmon, and Arctic Surplus site)</td>
<td>Saved time and improved working understanding between the various participants in the cleanup activities. Approximately $34 million savings</td>
<td>Javier Santillan (AFCEE), <a href="mailto:Javier.santillan@brooks.af.mil">Javier.santillan@brooks.af.mil</a> 210 536 5207</td>
<td>11</td>
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<tr>
<td>Massachusetts Military Reservation (Air National Guard)</td>
<td>UXO</td>
<td>Potential savings of up to $100,000</td>
<td>Long-term cleanup</td>
<td>Mark Harding, Mashpee Wampanoag Tribal Representative, <a href="mailto:mark@wampworx.com">mark@wampworx.com</a> 508 477 1600</td>
<td>*</td>
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<tr>
<td>Camp Hale, CO</td>
<td>UXO</td>
<td>Develop emergency training for firefighters</td>
<td>None available in the midst of fighting a massive wildfire</td>
<td>Jeff Swanson, <a href="mailto:jeffrey.swanson@state.co.us">jeffrey.swanson@state.co.us</a> 303 692 3416</td>
<td>12</td>
</tr>
<tr>
<td>Sierra Army Depot, CA</td>
<td>UXO</td>
<td>Improved understanding of permit project</td>
<td>Reduces public resistance and increases project efficiency</td>
<td>Laura Kaweski, Cal DTSC, <a href="mailto:lkaweski@dtsc.ca.gov">lkaweski@dtsc.ca.gov</a> 916 327 1198</td>
<td>13</td>
</tr>
<tr>
<td>Fort Ord Reuse Authority, CA</td>
<td>UXO</td>
<td>Educational assistance to all those involved with the project</td>
<td>Improves interface between remedial work and property development</td>
<td>Michael Houlemard, <a href="mailto:Michael@fora.org">Michael@fora.org</a> 831 883 3672</td>
<td>13</td>
</tr>
<tr>
<td>Fort Wingate Army Depot, NM</td>
<td>UXO</td>
<td>Educational assistance to all those involved with the project</td>
<td>Improves common understanding results in quicker, more adequate cleanup solutions</td>
<td>Dwight Hempel (BLM), <a href="mailto:dwight_hempel@blm.gov">dwight_hempel@blm.gov</a> 202 452 7778</td>
<td>14</td>
</tr>
<tr>
<td>Tooele Army Depot, UT</td>
<td>PDBs</td>
<td>Training gets all technical staffs using same common knowledge base</td>
<td>Helped evaluate other potential solutions</td>
<td>Carl Cole, <a href="mailto:Cole@emh2.tooele.army.mil">Cole@emh2.tooele.army.mil</a> 435 833 3341 or Laurie LaPlante, <a href="mailto:llaplante@kleinfelder.com">llaplante@kleinfelder.com</a> 801 466 6769</td>
<td>14</td>
</tr>
<tr>
<td>Fort Dix, NJ</td>
<td>ISCO</td>
<td>Lower cost, shorter implementation solution</td>
<td>Avoided Pump and Treat remedy; save several years of cleanup and several thousand dollars</td>
<td>Marshall Nelson, <a href="mailto:marshall.nelson@dix.army.mil">marshall.nelson@dix.army.mil</a> 609 562 2203</td>
<td>14</td>
</tr>
<tr>
<td>Army Environmental Center, Aberdeen, MD</td>
<td>DNA PL</td>
<td>Facilitates dialogue among state regulators, military, industry experts</td>
<td>Should improve cleanup solutions and reduce cleanup time and cost</td>
<td>Laurie Haines, <a href="mailto:Laurie.Haines@aec.apgea.army.mil">Laurie.Haines@aec.apgea.army.mil</a> 410 436 1512</td>
<td>15</td>
</tr>
<tr>
<td>Army Environmental Law Triad</td>
<td>Natural Attenuation of Chlorinated Solvents</td>
<td>Potential to change cleanup protocol</td>
<td>Re-evaluating sampling protocol that could alter remediation selection</td>
<td>John Shimp, <a href="mailto:shimpj@riley.army.mil">shimpj@riley.army.mil</a> 785 239 3343</td>
<td>15</td>
</tr>
<tr>
<td>Rocky Mountain Arsenal, CO</td>
<td>UXO</td>
<td>Improved communications between public health and environmental officials and the Army</td>
<td>Likely this will result in more timely, more efficient cleanup protocol</td>
<td>Ken Vogler, <a href="mailto:ken.vogler@state.co.us">ken.vogler@state.co.us</a> 303 692 3383</td>
<td>16</td>
</tr>
<tr>
<td>Army Base, KS</td>
<td>Natural Attenuation</td>
<td>Training results in consideration of natural attenuation remediation</td>
<td>“Significant expense savings” are anticipated at the DOD site</td>
<td>Tom Waller, KDHE <a href="mailto:twaller@kdhe.state.ks.us">twaller@kdhe.state.ks.us</a></td>
<td>16</td>
</tr>
<tr>
<td>Seneca Army Depot, NY</td>
<td>Permeable Reactive Barriers</td>
<td>Used guidance documents in placing wells &amp; establishing work plans</td>
<td>Simplified and improved state ability to review, understand &amp; comment and approve the application – Saved Time and Money</td>
<td>Michael Duchesneau, Parsons Engineering Sciences</td>
<td>16</td>
</tr>
<tr>
<td>Picatinny Arsenal, NJ</td>
<td>Phytoremediation</td>
<td>Single project, if successful, will have widespread applicability to treat arsenic</td>
<td>Potential to save up to $100,000 at this site</td>
<td>Cynthia Teeter, <a href="mailto:teeter@wes.army.mil">teeter@wes.army.mil</a> 601 634 4260</td>
<td>*</td>
</tr>
<tr>
<td>Fort Dix, NJ</td>
<td>Phytoremediation</td>
<td>Single project will be replicated at military bases in NJ and the US</td>
<td>Soil washing and Phytoremediation to cleanup firing range</td>
<td>John Cefaloni, <a href="mailto:cefaloni@pica.army.mil">cefaloni@pica.army.mil</a> 973 724 3295</td>
<td>*</td>
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<tr>
<td>Fort Monmouth, NJ</td>
<td>Diffusion Samplers</td>
<td>Reduced time requirements to secure samples by 50%</td>
<td>Allows for vertical profiling of wells with technology reducing long term monitoring costs 40 – 60% compared to conventional purge and sample or low flow sampling</td>
<td>Joseph Fallon <a href="mailto:joseph.fallon@mail1.monmouth.army.mil">joseph.fallon@mail1.monmouth.army.mil</a> 732 532 6223</td>
<td>*</td>
</tr>
<tr>
<td>Fort Riley, KS</td>
<td>Detection of TCE in soil. use Potassium Permanganate</td>
<td>Reduced the number of monitoring points &amp; subsequent analytical cost saving approximately $300,000</td>
<td>Change in protocol</td>
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### Navy

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</thead>
<tbody>
<tr>
<td>Naval Support – Mid South, TN</td>
<td>PDBs, DNAPL</td>
<td>Diffusion samplers saved time and money</td>
<td>ITRC ensure technology is used and promoted appropriately; Promote effective &amp; appropriate use of the technology</td>
<td>Jim Morrison, BRAC Project Manager</td>
<td>17</td>
</tr>
<tr>
<td>Numerous Navy and Air Force facilities</td>
<td>SC&amp;M- Direct Push Wells</td>
<td>Significant cost reduction by some 50%</td>
<td>Direct Push is an alternate to conventional well drilling techniques for sampling soil and groundwater</td>
<td>Bill Major, NFESC <a href="mailto:majorwr@nfesc.navy.mil">majorwr@nfesc.navy.mil</a> 805 982 1808</td>
<td>17</td>
</tr>
<tr>
<td>Lakehurst Naval Air Station</td>
<td>Diffusion Samplers</td>
<td>Reduced time requirements to secure samples by 50%</td>
<td>Change in protocol</td>
<td>Dennis Blazak <a href="mailto:blazakd@navair.navy.mil">blazakd@navair.navy.mil</a> 732 323 7544</td>
<td>*</td>
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**Key:**

- **DSP-3:** Technical and Regulatory Guidance for Using Polyethylene Diffusion Bag Samplers to Monitor Volatile Organic Compounds in Groundwater (February 2004)
- **DNAPL:** Dense Non Aqueous Phase Liquids
- **ISCO:** In Situ Chemical Oxidation – Technical and Regulatory Guidance for In Situ Chemical Oxidation of Contaminated Soil and Groundwater (June 2001)
- **PDBs:** Passive Diffusion Bag Samplers
- **Phytoremediation:** Phytotechnology Technical and Regulatory Guidance Document (April 2001); Phytoremediation Decision Tree (December 1999)
- **RPO:** Remediation Process Optimization: Identifying Opportunities for Enhanced and More Efficient Site Remediation (RPO-1) (September 2004)
- **SC&M:** Sampling, Characterization and Monitoring
- **SMART:** Small Arms
- **TRIAD:** Technical and Regulatory Guidance for the Triad Approach: A New Paradigm for Environmental Project Management (December 2003)
- **UXO:** Unexploded Ordnance

* : No additional information is included in the written text that follows these tables
ITRC Benefits the Department of Defense- Example Successful use of ITRC Products and Training

Kelly Air Force Base – Restoring Public Confidence in Cleanup Decisions

ITRC Board representatives, including Brian Sogorka of New Jersey, met with Kelly Air Force Base environmental personnel to discuss groundwater cleanup challenges. No less than 10 suitable ITRC tools, including regulator facilitation support, were identified during the preliminary visit, with at least seven of those ITRC technical publications or training opportunities key to base cleanup. Kelly AFB personnel and support staff from the Air Force Center for Environmental Excellence (AFCEE) specifically requested that Technology Deployment Initiative (TDI) team members continue attending public outreach meetings in support of proposed groundwater cleanup and BRAC closure activities. ITRC is leveraging its existing relationship with MMR personnel and plans to continue supporting a number of innovative technology validation projects.

FASTRAC Method, Triad Approach – McGuire Air Force Base and the C-17 Aircraft Hangar Project

The McGuire Air Force Base C-17 Aircraft Hangar MILCON project is a nationally important defense project that must be completed online by 2004. When a tetrachloroethylene (PCE) plume and potential source area were discovered in the five acre footprint of the 28 million dollar hangar project, Head Quarters, Air Mobility Command (AMC) believed, based on past experience, that it would take at least a year to get a work plan developed and approved, and likely an additional year to accomplish an assessment and develop a remedial plan. This would delay a project essential to the McGuire AFB mission. John Pohl, McGuire Restoration Program Manager, was ready to put Triad methodology to work and informed the C-17 Program Office that they could accomplish the work in only a few months instead of the conventional timeframe of several years.

The McGuire AFB Environmental Restoration Team, led by Christopher Archer and John Pohl, combined key ideas emerging in the technical and trade literature [e.g., ASTM Expedited Site Assessment, Systems Engineering Principles, and EPA Triad Approach www.epa.gov/tio/triad] with practical experience gained over the course of years of interactive strategizing with state and federal regulators at bi-monthly Technical Review meetings into what they refer to as the McGuire FASTRAC Method. FASTRAC is a unique combination of environmental management theory, innovative assessment methodologies, and collaboration between the Installation Restoration Program Manager (IRPM), the contract service center, and regulatory authorities and other stakeholders (e.g., local environmental groups, appointed citizen oversight, etc.). The goal of FASTRAC is to achieve fast and defensible results from first discovery-to-site closure, with a high degree of management and contractor accountability.

ITRC Network Proves Critical to FASTRAC Implementation

When representatives from McGuire Air Force Base (AFB) in New Jersey first approached the New Jersey Department of Environmental Protection (DEP) and EPA Region II about something called the “US EPA Triad methodology” to characterize contamination at one of their sites, the regulators were receptive to the idea, but wanted to hear more. Fortunately, John Pohl of McGuire was aware of the ITRC and its mission to reduce regulatory barriers to innovative technologies and processes. As a member of the ITRC Sampling, Characterization & Monitoring (SC&M) team for over two years, John reached out to the ITRC Point of Contact (POC) for New Jersey for backup support in the educational process. The ITRC had conducted a Triad seminar at the New Jersey DEP in May 2002 and as a result, the POC was able to provide supporting information to the New Jersey DEP managers and staff involved in the project.
Subsequent to the briefing, the McGuire AFB FASTRAC Team conducted a detailed orientation on the Triad methodology at one of their bi-monthly technical review meetings, which included support from New Jersey DEP ITRC contacts. The briefing addressed applicability of key elements of the Triad approach at McGuire AFB sites. This led to the successful implementation of the FASTRAC method at the C-17 site at McGuire AFB.

John Pohl has developed a “case study” for the C-17 Hangar project at McGuire which will be incorporated into the ITRC SC&M team report entitled “Technical and Regulatory Guidelines for Applying the Triad Approach to Environmental Projects (TRG).”

**ITRC Saves Costs for Federal Agencies**

McGuire Air Force Base is looking at a **cost savings of $1.34 million** for the C-17 Aircraft Hangar project and projects a **cost savings of over $37 million** in the McGuire Installation Restoration Program alone by utilizing the FACTRAC method.

George Hall, Program Advisor for the Sampling, Characterization and Monitoring team, concurred with the assessment regarding the success of the McGuire AFB FASTRAC method. “John Pohl’s recognition that the Triad Approach and other expedited site assessment methods could help solve the C-17 hangar dilemma was instrumental in advancing both the ITRC and the Air Force acceptance of this better way to assess contaminated sites.”

**Whom can I contact to learn more about this example of ITRC success?**

John G. Pohl  
Restoration Program Manager  
McGuire Air Force Base  
2403 Vandenberg Avenue,  
McGuire AFB, New Jersey 07641  
(609) 754-3495  
john.pohl@mcguire.af.mil

Brian Sogorka  
New Jersey Department of Environmental Protection  
401 East State Street, POB 413  
Trenton, NJ 08625  
(609) 633-1344  
Brian.Sogorka@dep.state.nj.us

George Hall  
Hall Consulting, PLLC  
4217 West 91st  
Tulsa, OK 74132  
(918) 446 7288  
TechnologyConsultant@prodigy.net
Diffusion Sampler Successes Continue with the Air Force

Another successful Air Force story comes from the Diffusion Sampler team. The new guidance document, *Technical and Regulatory Guidance for Using Polyethylene Diffusion Bag Samplers to Monitor Volatile Organic Compounds in Groundwater* (DSP-3, has recently been released for public use and is available on the ITRC website (www.itrcweb.org). Mario Ierardi of the Air Force (RPA/EV) responded enthusiastically: “Congratulations on an excellent job with this document. In my 25 years of government service I have never seen a diverse group of regulators, private industry and the services work so effectively together. You truly represent a model for others to follow. I would like to see this nominated for Government Excellence and Quality Awards. Thank you for your excellent work for improving the understanding of this technology.” According to Barry Weand, “This has been a very hard working, professional and congenial group to work with. In past experiences I have found that personal agenda and egos often got in the way of progress. My dealings with this group have been much the opposite. A conference call just a month ago to tidy up a few issues left me amazed that we could all discuss the issues rationally and come to agreement within a relatively short time.”

Triad Process and Brownfield sites

On the March 2004 POC and TL conference call, Stu Nagourney described to the telephone audience the nature of the Triad process and its importance in the Air Force remediation efforts for solvents at McGuire Air Force Base in New Jersey. A key participant in the Triad success in New Jersey has been Brian Sogorka, State Point of Contact for New Jersey. Mr. Sogorka described the value of the Triad approach to environmental remediation decision-making and suggested the value of Triad especially related to brownfield sites. He suggested to all of the other POCs on the conference call that they can save considerable amounts of time and money for cleanup by using the decision processes and characterizations based on Triad. The document *Technical and Regulatory Guidance for the Triad Approach: A New Paradigm for Environmental Project Management* has been published and is out for concurrence among state Points of Contact.

Stu Nagourney also reported on the request by Air Force Undersecretary Koetz that three Florida Air Force installations consider the Triad approach to environmental management. ITRC representatives have made themselves available to participate in this process as requested by the Air Force.

Use of ITRC Products to Save Time and Money at Lackland Air Force Base

*Background:*
The Interstate Technology Regulatory Council (ITRC) provided the catalyst to get SMART (Small Arms Firing Range Team) solutions implemented in clean up and ultimate soil disposal at the Lackland Air Force Base (AFB) in San Antonio, Texas. During the development of the first ITRC guidance document by the Small Arms Range Team, *Characterization and Remediation of Soils at Closed Small Arms Firing Ranges*, various alternatives to expensive off-site disposal of lead contaminated soils were examined by representatives of industry, military, regulators, consultants, and academia. Gary Beyer, a RCRA Corrective Action specialist for the Texas Commission on Environmental Quality and SMART member, was approached by Don Ficklen, head of the Environmental Program at Lackland AFB, to consider various alternatives to off-site disposal. This process eventually led to the selection of an alternative that saved well over $10 million.
The Setting
At a small firing range of approximately 100 acres on the Lackland AFB, the closure of the site included stabilizing the soil in the berm areas contaminated with lead. After evaluating various stabilization techniques, the MAECTITE chemical was added to the soil, encapsulating the lead contamination to keep it from migrating out or deeper into the ground. Immediately adjacent to the firing range was an old landfill of approximately 15 acres. This landfill had been contaminated with VOCs, SVOCs, and metals and had a number of depressions, surface cracks, along with tree growth. Since this cover was inadequate, plans were being made to cap this landfill.

However, instead of taking the soil from the berm to a hazardous waste site some 150 miles away, a much more practical and cost-friendly solution was to use the soil from the berm to fill in the cracks and depressions at the landfill. This treated soil was monitored for a couple of years.

As reported in the 2001 Annual Report to Congress, Lackland Environmental Flight Chief Ed Roberson stated: “It’s a very sensible approach benefitting the environment and taxpayers. It keeps 3,500 truckloads of untreated soil off the highway and eliminates exorbitant transportation and disposal fees that generally run $250 per cubic yard, and the need to purchase additional soil for the foundation.”

ITRC Training Pays Off!
Gary Beyer suggests that everyone involved with the cleanup of hazardous waste sites should

“consider participating in the programs, attend internet training courses, and use guidance documents developed by the ITRC to examine using cutting-edge technologies and regulatory solutions developed and promoted by the ITRC to save time and money and promote the decreased risk to environmental hazards. Information from the ITRC internet training, including Characterization and Remediation of Soils at Closed Small Arms Firing Ranges, was key in developing the protocol that included alternatives to the off-site disposal of hazardous waste.”

Whom can I contact to learn more about this example?

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UXO Training Included in Air Force Safety Information

According to Dave Brown at the Tyndall Air Force Base in Florida, the Air Force created an interactive, four-lesson UXO Safety CD and included the UXO basic training information on visiting a UXO contaminated site. This training will be posted on the web site. “Thanks again for allowing us to plagiarize portions of your UXO training plan. It provided a perfect launching point for sections of our lesson on visiting a UXO contaminated site,” according to Mr. Brown. “Having the ITRC information already available saved us about a week of development time, probably $1,200 in development cost. The course focuses on day to day cleanup up at facilities and educates people before going onto a range.”

ITRC Paving the Way to Successful Cleanups

ITRC paved the road for the Air Force Center for Environmental Excellence and the Defense Logistics Agency (DLA) to implement the Remediation Process Optimization (RPO), Diffusion Sampler, and Performance-based management (PBM) initiatives at the Department of Defense installations in Alaska. Sites where these methodologies were employed include the King Salmon Air Force Base (AFB), Galena AFB, Eielson AFB and the Arctic Surplus Salvage Yard. Diffusion Sampler Team Leader George Nicholas traveled to Seattle to participate in technical presentations and discussions of the mission of ITRC and the promise of Passive Diffusion Bag Sampling techniques. EPA regulator Neil Thompson and Alaska (ADEC) regulator Greg Light committed to demonstrating PDBS and RPO and have been pleased with the results from these efforts. So what was the net result of all of this interest? Three soil sites have been closed at Eielson AFB; Passive Diffusion Bag Samplers have been used to vertically profile contaminants at the Galena and King Salmon Air Force Bases; and the Arctic Surplus site remediation was quickly completed.

Arctic Surplus is a privately owned salvage yard located 6 miles southeast of Fairbanks, Alaska. The site occupies approximately 24 acres, including 6.5 acres of a Formerly Used Defense Site (“FUDS”). A portion of the FUDS area was formerly used as a military landfill. The salvage yard has been the site of piles of assorted old cars, military vehicles, and other metal-containing material—such as batteries and transformers—for more than 50 years. The owner purchased the excess military material at public auctions, including those held by the Air Force and DRMS in the 1950s through the 1980s in hopes of selling the metal recovered from the items. However, battery cracking and transformer burning by the site owners to recover metals caused extensive PCB and lead contamination of the soil at the salvage yard. After a site inspection in 1988, the ADEC identified the yard as a significant risk to human health and the environment. The soil was contaminated with significant levels of polychlorinated biphenyls (PCBs) and lead. Piles of bulk asbestos and thousands of drums of liquid waste were also found. Echoing the state’s concern, the Environmental Protection Agency (EPA) declared the yard a Superfund Site in 1990, placing it on the National Priorities List and naming the Department of Defense (DoD) as a potentially responsible party (PRP). After an extensive site study in 1995, the EPA developed a plan to resolve the polluted site. The remedy called for washing the contaminated soil free of high-level PCBs. The soil contaminated with low levels of PCBs and the remaining soil would be combined and stabilized in a concrete mixture. The resulting solidified concrete was then placed over an old landfill at the site as a containment cell or “cap.” By 1996, more than $13.5 million was spent on site studies and cleanup activities. However, work on the cleanup came to a halt from 1996 through 2002.

After years of agency disagreement and delays due to budget obstacles, the Department of Defense tasked DLA as the lead agency in the site cleanup. DLA began their efforts in 2002 with the selection of an expert remediation team tasked with visiting the site and reviewing the 1995 EPA prepared Record of Decision (ROD). The Restoration Program Optimization (RPO) team was asked to review the ROD to determine if there were cost-effective and risk-protective remedial action (RA) alternatives available for the site. The RPO Team evaluated the ROD-selected Ras and recommended several modifications. The new proposal recommended solidifying and stabilizing of all waste soils contaminated with PCBs and lead and placing the mixture as a cover over the “Old Army Landfill”. By implementing
these recommendations, **the RA cost has been reduced from $38 million to under $3.5 million**; the remediation time was shortened from four years to just over one year. In addition, the original proposal rendered the property unusable for the foreseeable future, while the RPO proposal allowed for unlimited industrial use of the land with the exception of the landfill that will have land-use controls and institutional controls. Because the site is a third-party site, no DLA employees are permanently located at the site. LTC Dan Welch represented DLA Headquarters at the site and was responsible for overall management of the site, including ensuring the necessary project funding and reporting back to Headquarters on project compliance status. Javier Santillan was the AFCEE project team leader responsible for contractor selection and direction as well as identifying innovative technology opportunities for the site. Bruce Noble was the senior project manager tapped by DLA to oversee the management and technical decisions of the cleanup. Judy Malmquist, a DLA attorney with years of experience in settling cases involving third-party site liability, was selected to oversee the regulatory requirements, including all negotiations with the regulators and landowners. All four individuals spent countless hours in Alaska, overseeing the cleanup, negotiating with the landowners and regulators, and seeing the projects to their completion.

**Taking the UXO Basic Training to Wildland Firefighters**

**Camp Hale and the 2002 Colorado Wildfire Season**

In one of the worst fire seasons in decades, some of Colorado’s Wildland firefighters faced not only intense fires due to severe drought conditions but also potential encounters with unexploded ordnance (UXO).

The Camp Hale Formerly Used Defense Site is a 200 square mile former World War II winter training facility located in the White River National Forest in Eagle County, Colorado. The U.S. Army Corps of Engineers Omaha District and the State of Colorado had already been working with the U.S. Forest Service on ordnance contamination issues at Camp Hale for over 2 years prior to the summer of 2002. During a project team meeting in July of 2002, a lightning strike ignited a tree in an area with known ordnance contamination, creating a situation that increased the risk and hazards to the firefighting forces.

The ordnance experts on hand did not have the training or experience to fight wildland fires and the firefighters did not have training or experience with unexploded ordnance. While the tree smoldered, suppression response options were considered. All involved agreed that the firefighters assigned to the area should receive specialized training. But where could they get this training on short notice? After firefighters were briefed on ordnance identification, they entered the area to extinguish the fire.

**ITRC Provides Training**

The Camp Hale project team put together a ‘boot strap plan’ to respond to the immediate situation and to prepare for future situations by training the firefighters. Fortunately, the ordnance hazard identification and safety consideration portion of ITRC’s UXO Basic Training course had already been developed and contained exactly the type of information needed. Staff from the U.S. Army Corps of Engineers Omaha District and ITRC UXO Team members from the Colorado Department of Public Health and Environment and from Shaw Environmental & Infrastructure updated the relevant sections of the existing ITRC training with Camp Hale specific information and incorporated fire management protocol information.

To deliver the training, the Upper Colorado River Interagency Fire Management Office coordinated attendance with the Forest Service, the Corps of Engineers, and the Bureau of Land Management (including representatives from Alaska and the Pacific Northwest). In the end, a total of 40 firefighters attended this first firefighter training course, given just one week after the need for the training was recognized.
**ITRC Saves Training Costs for Federal Agencies**

Since that time, the ITRC training course has been given to the U.S. Forest Service in Medicine Bow National Forest, Wyoming, and to the Bureau of Land Management’s Alaska Fire Service in Fairbanks, Alaska. Pole Mountain in Medicine Bow is a Formerly Used Defense Site (FUDS) while the Alaska Fire Service, operating out of Fort Wainwright, has jurisdiction over firefighting for central Alaska including a large number of military ranges with UXO.

On-site interagency fire management training such as this could cost federal agencies up to $1,000 - $1,500 per-person for on-site training. Had only an off-site course been available, travel costs would have increased the expense. The cost of developing such a course in-house, especially on such short notice, would also have been significant. Approximately 230 people have attended one of the three trainings conducted to date. Therefore, the potential savings to these agencies is as high as $230,000 to $345,000 for on-site training. Although these federal agencies have saved money in training costs, they have not sacrificed quality.

The training is “highly professional and informative,” according to one of the smokejumpers who has attended this training. “In previous years, the EOD [explosive ordnance disposal] had offered similar training, but it was beneficial for the firefighters to receive the civilian perspective on the risks as well as the national perspective that could be brought by the ITRC training,” according to Tami DeFries, Military Zone Fire Management Officer, Alaska Fire Service.

- **UXO Training helpful at Sierra Army Depot (CA)**
  “UXO Basic Training helped me to understand a permit project on which I am evaluating environmental documents and public comments. It helped me to put into context the potential dangers inherent in Open Burning/Open Detonation (OB/OD) operations,” said Laura Kaweski, regulator with the California Department of Toxic Substance Control of the project at the Sierra Army Depot.

- **Community Understanding at Fort Ord Site (CA) using UXO Basic Training information**
  Michael Houlemard, executive officer of the Fort Ord Reuse Authority, indicated potential significant savings as a result of UXO Basic Training associated with a project at the Fort Ord site in Monterey. Being able to move forward with the reuse of both former ranges and areas adjacent to former ranges will create value to the community.

  “The training served as a focused supplement to our regular activity with the remedial actions of the US Army, and it informed our work in developing educational programs for identification and safety in future reuse. In addition, we are embarking on a program that seeks to improve the interface between remedial work and property development which will require some fairly sophisticated engineering and construction support.”
Multi-state Solutions for the Bureau of Land Management

The Bureau of Land Management (BLM) is currently working on a base closure in New Mexico at the Fort Wingate Army Depot near Gallup. The state of New Mexico Environment Department is writing a Resource Conservation and Recovery Act (RCRA) post-closure care permit for the open burn/open detonation area but also including all the solid waste management units on the installation. They are working very closely with a large group of people all of whom are benefiting from the ITRC training and documents. “I have over 70 people on my email distribution list dealing with this site. State regulators, EPA, two tribes, multiple Army organizations, Bureau of Indian Affairs, and a private contractor must all be able to speak a common language regarding cleanup at this site,” according to Dwight Hempel, Senior Specialist for Military Liaison. He knows first hand the importance of ITRC training and guidance documents.

“There are over 5.4 million acres of lands administered by the Bureau of Land Management (BLM) known to or suspected of containing unexploded ordnance (UXO). One of our biggest problems is getting training to all of the people who are dealing with these issues.” Mr. Hempel stated, “Everyone who has attended the classes has said that the material was just what they needed in order to speak intelligently about the subject. Breaking down the language barriers is the key.”

Additional information on this story is available on www.itrcweb.org in the success story labeled “Bureau of Land Management Coordination of UXO Issues (August 2003).”

Passive Diffusion Bag Sampler Information is Critical

Laurie LaPlante, a senior engineer with Kleinfelder, Inc., suggests potential savings through use of ITRC internet training and Passive Diffusion Bag Sampler (PDBs) CD at the Tooele Army Depot. “Training was extremely good, well-timed and helped to get all of the technical folks on board and together on the proper use of PDBs,” she said. Several organizations are involved including the Corps of Engineers in Sacramento, the Tooele Army Depot, the Utah Department of Environmental Quality, and Kleinfelder. The site has a large groundwater plume discovered in the mid-80s. At the time, they were switching from a purging and sampling process to PDBs for monitoring the plume.

Although the project team knew there would be savings in the long run, there were a number of questions concerning this new process such as whether the data would be comparable to the previous collection methodology. There were also implementation questions such as monitoring depths, proper spacing and intervals. The training provided good discussion concerning these issues. “The instructors and participants discussed approaches and other information for the project team to pursue,” according to Ms. LaPlante.

ITRC Internet Training and Guidance Documents Pave the Way for In Situ Chemical Oxidation Savings

In New Jersey, remediation at Fort Dix is being planned in lieu of a pump and treat or other traditional solution to leaking Underground Storage Tanks (UST) that have been releasing gasoline, fuel oil and perhaps heating oil following use in World War II. The use of In Situ Chemical Oxidation (ISCO) at the site will definitely present a lower cost and in a shorter implementation period than traditional solutions, thanks in part to training and guidance documents from the ITRC concerning ISCO.

Natural attenuation of the contaminant was not an option at Fort Dix since more aggressive action was required by the movement of the plume. “We hoped to avoid the typically long process of pump and treat and ISCO seemed to be a
reasonable approach to take,” Marshall Nelson of Fort Dix stated. Based on conversations with the New Jersey Department of Environmental Protection, the ISCO training provided enough information upon which plans could be made to remediate the site using ISCO.

It is most likely that the implementation of the ISCO will save several years of cleanup, during which time the site may become available for other uses, increasing the value of the land and reducing the environmental hazards that currently exist at the site. Development and implementation of a cleanup plan using ISCO will not only result in an effective solution but also one that saves time and money in implementation. Treatment using ISCO will likely cost in the range of several hundred thousand dollars with the savings dependent entirely on how long pump and treat would have been required without the ISCO treatment.

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**DNAPL Funding**

Laurie Haines of the Army Environmental Center at Aberdeen, Maryland is a member of a sub-group on the DNAPL team. The work, focus and communications capabilities of the DNAPL team persuaded her to procure additional funding for the DNAPL team. This $50,000 enabled the team to meet more often and to get performance assessments developed more quickly. “In the real world, the questions become how to measure the different remedial actions because DNAPLs are never completely remediated. The DNAPL team has a diverse set of opinions from stakeholders, state regulators, industry experts, and the military- it is a great forum and it especially facilitates dialogue with the state regulators about these issues.” Laurie suggests that having everyone involved in the front end makes the conversation all that much more valuable.

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**Dry Cleaning Facility Cleanup at Fort Riley**

John Shimp of the US Army Environment and Safety Installation Restoration Program indicated that based on the internet training he received in Natural Attenuation of Chlorinated Solvents he is re-evaluating sampling protocol which could inform the remediation selected at a dry cleaning facility at Fort Riley, Kansas.

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**Army Environmental Law Division Streamlines Decision-making with TRIAD**

The Assistant Commissioner of the New Jersey DEP received correspondence regarding the TRIAD training developed and promoted by ITRC and the New Jersey DEP. “This morning, I was speaking with our head of Army cleanup – he mentioned that he was very impressed with reports he had heard of Army installations that had used the Triad approach to streamline cleanup decision-making. He was interested in seeing if we could learn more about Triad.” This lawyer, in the Army Environmental Law Division focuses on cleanup work, is interested in setting up Triad training for those who work in the ELD office in Arlington.
UXO Basic Training Speeds Cleanup at Rocky Mountain Arsenal

Colorado has several former military sites that are contaminated with old munitions. One of these is located on the former Rocky Mountain Arsenal, a 202 acre range used to test 4.2-inch mortars. Regulatory personnel assigned to oversee the cleanup of the range included representatives from the State of Colorado and Tri-County Health Department who had no previous experience with or exposure to cleanup of military munitions. “ITRC’s UXO Basic Training course gave us a base of understanding about munitions and consequently we are able to more effectively work with Army representatives on the cleanup work that is being done at the Rocky Mountain Arsenal,” according to Ken Vogler of the Colorado Department of Public Health and Environment.

Natural Attenuation Training Course Savings in Kansas

Based on training that he received at the ITRC/RTDF training course on Natural Attenuation of Chlorinated Solvents in Salt Lake City, Tom Waller, a KDHE project manager, observed a classic biodegradation pattern within a chlorinated solvent plume at an active Army base in Kansas. Tom recognized that anaerobic biodegradation in the presence of an abundant electron donor (Stoddard solvent) was occurring at the site. He described the evidence for natural attenuation to the base project manager.

Mr. Waller now anticipates that natural attenuation will be considered as a major remedy for groundwater contamination at the site. By taking the lead in identifying the natural attenuation process, Tom accelerated the process of identifying remedial alternatives for the site, saving the Department of Defense significant expense.

Seneca Army Depot Saves using Permeable Reactive Barriers

Seneca Army Depot Contractors and Site Manager used ITRC PRB guidance to develop their application to the state. Michael Duchesneau, Parsons Engineering Sciences described the PRB documents as “Very valuable and state of the art guidance”. They relied heavily on the monitoring section of the guidance to place their wells and to establish an acceptable work plan. Mike himself attended ITRC/RTDF PRB Training course along with the NYSDEC staff working on this and other PRB projects. The wall is 650 ft long 12 – 14 ft deep and 14 “ wide with a equal mix of iron and sand. Jim Quinn, Federal Project Section, NY Department of Environmental Conservation stated that he and other NYSDEC Staff had attended ITRC Permeable Reactive Barrier course and gained a much better knowledge of the application, various designs and monitoring requirements. This training in connection with ITRC PRB documents accelerated simplified and improved the state’s ability to review, understand and confidently comment and approve the application. ITRC documents were and excellent source of information for the department and saved both the consultants and the state time which translates into money for both.
Naval Support Superfund Site Diffusion Sampler Success

In the case of a Superfund site, the Naval Support Activity Mid-South in Memphis, diffusion samplers were first used successfully in the mid-90s, prior to ITRC involvement, to monitor Dense Non-Aqueous Phase Liquids (DNAPLs). As BRAC (Base Realignment and Closure) Project Manager for this site, Jim Morrison states that

“While we had great success using diffusion samplers, saving us considerable time and money and locating contaminant preferential pathways in the subsurface, it is very important to understand the limitations of diffusion sampler. A problem we experienced in the beginning was acquiring false negative data by misapplication of the diffusion samplers that in turn led to some misinterpretation. While diffusion sampling is not the panacea for detecting and evaluating volatile organics in the environment, it does come very close, especially if proper application of the samplers is adhered to and site conditions evaluated prior to installation. The ITRC resources, information and industry-wide dialogue within the ITRC are critical to ensure that the technology is used and promoted appropriately.”

The new Diffusion Sampler Technical Regulatory Guidance Document should further promote the effective and appropriate use of the technology.

*Direct Push Techniques for Groundwater Monitoring*

Groundwater monitoring enables us to detect contaminated groundwater that may be a threat to the health and welfare of humans and biota. Direct push (DP) is an alternative method to conventional well drilling techniques for sampling soil and groundwater, and installing monitoring wells in unconsolidated materials such as clay, silt, sand, and gravel. The DP methods do not generate a large volume of potentially contaminated drill cuttings as conventional drilling methods do. This means that the field investigators and local residents are less likely to be exposed to contaminated media. This DP capability significantly lowers the cost of a groundwater investigation, often by more than 50 percent when compared to conventional drilling and installation of permanent monitoring wells.

The ITRC's Sampling Characterization and Monitoring Team is close to completing a Technical/Regulatory document on Direct Push Wells. The Team Lead for this project is Bill Major of the Naval Facilities Engineering Services Center in Port Hueneme, Ca. (majorwr@nfesc.navy.mil; (805)-982-1808). Bill and his colleagues have been leading researchers on direct push technologies, and the ITRC document will highlight case studies at Navy and Air Force facilities.

*Classroom and Internet Training Classes Bring Success to DOD Participants*

“This is my second seminar, and I've found them to be a great resource. By combining info from all the services & other sources, it's easy to get a general understanding of current best practices. The list of historical sources provided in your Guidance Document is also very helpful. Thank you.” [Navy participant in Munitions Response Historical Record Review (MRHRR) class]

“Lajes Field is the largest refueling installation in the Air Force, with over 50 years worth of POL and chemical spills and poor management practices which we are only now beginning to clean up. Initiating our remediation program is a huge task, one I hope to establish and get moving in the right direction and with the most efficient and cost-effective means available. I will certainly be looking to EPA-ITRC for more training to assist me in this process.” [Air Force participant in the In Situ Chemical Oxidation training]
“Thank you!!!!!!!” [Navy participant in Systematic Approach to In Situ Bioremediation in Groundwater: Nitrates, Carbon Tetrachloride & Perchlorate class]

"I thought the training provided a lot of good information which helped me gain familiarity with this subject. It was well organized and presented by knowledgeable instructors." [Navy participant regarding class on Constructed Treatment Wetlands]

“The classroom and internet seminars and downloadable guidance documents are valuable tools whether I am working on my projects at Camp Stanley Storage Activity, Webb Air Force Base, San Jacinto Ordnance Depot, U.S. Naval Air Station - Kingsville or working on industrial and hazardous waste sites. Educating and imparting technical knowledge and expertise to regulators and regulated community is definitely a broad spectrum success story for ITRC.” Sonny Rayos, a project manager with the Texas Commission on Environmental Quality, speaks highly on the ITRC classroom and internet training, along with the guidance documents produced by the ITRC.

Whom can I contact to learn more about these examples of ITRC success?

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