ITRC Technical Team Overview
Four Teams in 45 Minutes

November 7, 2002

10:15 – 11 a.m.

SMART (Small Arms Firing Ranges)

Robert Mueller, New Jersey DEP

Dib Goswami, Washington Dept of Ecology

Team Composition

- **6 states**
  - NJ, Wa, Tx, Fl, Ma, SC
- **11 consulting firms**
  - CTC, MTT, AMEC, Surbec, RMT, MT, BEM, RIO, PMK, Retec
- **1 Stakeholder**
  - Peter Strauss
- **3 Service Agencies**
  - US Army Center for Health Programs and Preventive Medicine
  - Army
  - AFCEE
- **2 Trade Associations**
  - National Shooting Sports Foundation
  - Wildlife Management Institute

Project Description

- **Problem**
  - Closed or closing
    - » DoD
      - Over 200 closed sites
  - Active
    - » DoD
      - Over 3000 active SAFRs
  - Non-military
    - » Over 9000

- **Purpose**
  - Logical and easy to follow decision matrix for determining how best to remediate lead and lead contaminated soils at small arms firing ranges

Current Activities

- Revised document according to Pre-concurrence review
- Finalizing the response to comments to include as an appendix
- Preserving issues for future consideration
- Internet training Dry Run 12/12/02

Future Plans

- Internet Training
- Encourage and track guidance use
- Discussions with EPA Region 2 and States on Berm Reuse On- Site and Off-site
- Management and Mitigation Guidance
- Work with appropriate states encouraging Lead Management with state program examples

Recent Accomplishments

- Contacted by consultant hired to remediate abandoned SAFR owned by City. Want to reuse berm material to reduce costs
- Excellent debate during Pre-concurrence review resulting in a better document and more defined issue.

In Situ Bioremediation Team

Bart Faris – New Mexico

Kris Roberts – North Dakota

Paul (Bunyan) Hadley - California

Team Composition

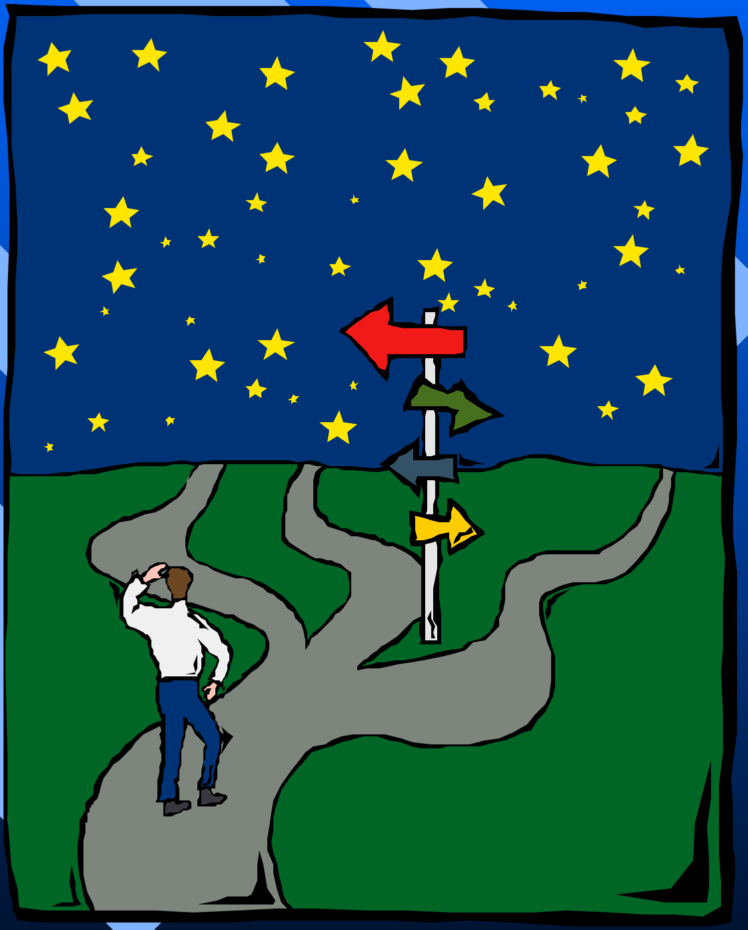
- States (ND, NM, CO, VA, MO, KS, OK, NH)
- Academia
- Industry
- DOD
- DOE
- EPA
- Stakeholder

ISB's Mission

- To go underground
- To feed all bugs (aka bacteria)
- To destroy and/or immobilize all contaminants
- To do this systematically
- Get the job done

Current Activities

- ISB applications can be multifaceted
- Promote our little friends
- Focus on the right path
- Internet training



Why is ISB Attractive?

- Destruction of COC
- Minimal Waste Generated
- Reduce risk of exposure
- Relatively lower cost
- Potentially shorter clean up life
- In Situ

Recent Accomplishments

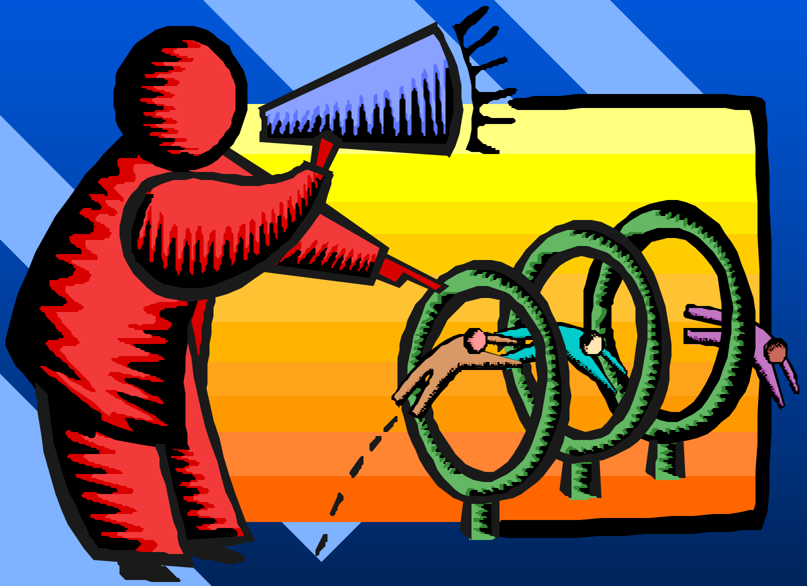
- Completed a Technical and Regulatory Guidance Document
- *Systematic Approach to In Situ Bioremediation in Groundwater: Including Decision Trees on Nitrate, Carbon Tetrachloride & Perchlorate*
- Internet Training

A Systematic Approach to ISB

- Guidance to characterize, evaluation, and design & testing of ISB for any bio-treatable contaminant.
- To be used by regulators, consultants, responsible parties, and stakeholders when an ISB technology is considered.
- Consistent Approach
- Decision Trees (Generic, NO_3, CT, CLO_4)

Technical and Regulatory Guidance Document

- **What is *in situ* bioremediation?**
- **Important elements of site characterization**
- **Fate & Transport**
- **Feasibility**
- **Advantages & Limitations**
- **Contaminant characteristics & degradation pathways**
- **Issues**
- **Links to additional resources**



Future Plans

- Track Case Studies
- Joint partnership with other ITRC Teams
- Apply the Systematic Approach to different Contaminants
- Help ITRC's constituency to use our guidance document for any contaminant

ITRC Radionuclides Team Overview

Team Leads:

- Tom Schneider, Ohio EPA
- Carl Spreng, Colorado Dept. of Public Health & Environment

Team Composition

Team Members:

- 7 State regulators
- 2 Stakeholders
- 1 Tribal representative
- 5 Federal agency representatives
- 5 Industry / Consultants / Academia

Interested Parties:

- 7 State regulators
- 1 Stakeholder
- 1 Tribal representative
- 15 Federal agency representatives
- 7 Industry / Consultants / Academia

Mission Description

Facilitate the cleanup of radioactively-contaminated federal facilities by fostering dialogue between states, stakeholders and federal agencies in order to increase awareness of issues and procedures at sites in other states, encourage regulatory cooperation and share technological successes and approaches.

Focus Areas

- Cleanup Levels
- Characterization Technologies
- Cleanup Technologies
- Waste Issues
- Long-Term Stewardship

Team Products

Radiation Reference Guide: Relevant Organizations and Regulatory Terms
(December 1999)

Determining Cleanup Goals at Radioactively Contaminated Sites: Case Studies
(April 2002)

Recent Accomplishments:

"DETERMINING CLEANUP GOALS AT RADIOACTIVELY CONTAMINATED SITES: CASE STUDIES" (April 2002)

To improve consistency in cleanup decisions, this examines the context, risk assessment approaches and frame-work for establishing soil remediation levels at 12 major radioactively-contaminated sites

Differences in Cleanup Goals

Different Regulatory Authorities and Bases

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Different Regulatory Standards

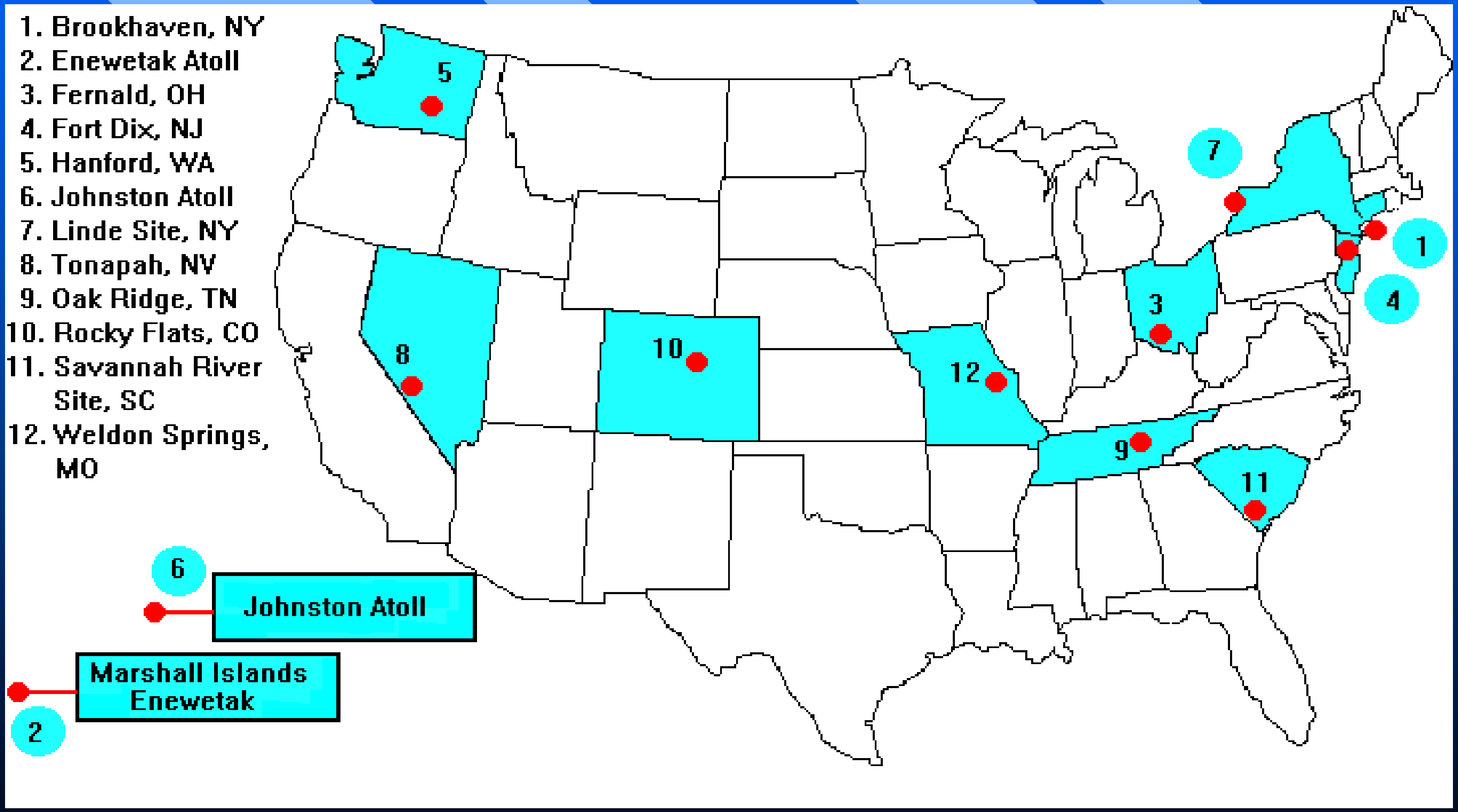
↓

Different Methodologies for Calculating Cleanup Goals

Major U.S. Radiation Standards:

Regulation	Agency	Standard / Numerical limit
General public	NRC	100 millirem/year
Uranium mill tailings	EPA; NRC	Ra-226/228: 5 pCi/g (surface) 15 pCi/g (subsurface) Rn-222: 20 pCi/m^2-sec
High-level waste operations	NRC	100 millirem/year
Spent fuel, high-level & TRU waste	EPA	All pathway: 15 millirem/year Groundwater: 4 millirem/year
Low-level waste	NRC	25 millirem/year
Drinking water	EPA	Radium: 5 pCi / L Gross alpha: 15 pCi / L Beta/photon: 4 millirem/year
Uranium fuel cycle	EPA	25 millirem/year
Superfund (CERCLA) cleanup	EPA	1 in 10,000 to 1 in 1,000,000 excess lifetime risk of getting cancer
Decommissioning	NRC	25 millirem/year
Occupational standards	OSHA;NRC	5,000 millirem/year
NESHAPS air pollutants	EPA	10 mrem/year to nearest offsite receptor

Case Study Locations



DETERMINING CLEANUP LEVELS AT RADIOLOGICALLY CONTAMINATED SITES

- Case Studies:
  - Regulatory basis
  - Major radionuclides of concern
  - Land-use scenarios
  - Models
  - Input parameters
  - Cleanup level calculations
  - Modifying factors

CASE STUDIES

Selection of Exposure Scenarios

Site	Resident	Rancher	Farmer	Park/Open Space User	Commercial Industrial	Fish & Wild-life Service	Ecotourist	Homesteader	Subsurface
Brookhaven	▤				▤				
Enewetak	▤		▤						▤
Fernald			▤	▤					
Ft. Dix	▤				▤				
Hanford	▤								
Johnston Atoll	▤					▤	▤	▤	
Linde Site					▤				
Nevada	▤	▤	▤		▤				
Oak Ridge					▤				
Savannah River					▤				
Rocky Flats	▤			▤	▤	▤			
Weldon Spring	▤		▤	▤		▤			

CASE STUDY: Oak Ridge

Radionuclide	10^{-4} Risk (pCi/g)	25 mrem/yr Dose (pCi/g)	Basis of Selection
Cesium-137	14	40	Risk
Cobalt-60	7.4	8.4	Risk
Curium-244	2300	950	Dose
Europium-154	11	18	Risk
Lead-210	450	270	Dose
Radium-226	Alternative –	-Concentration	---
Strontium-90	1200	3400	Risk
Uranium-233	5100	5500	Risk
Uranium-234	6500	6000	Dose
Uranium-235	81	170	Risk
Uranium-238	310	850	Risk

Case Studies - Conclusions:

- Differences in cleanup levels from site to site are due to variations in one or more of the elements in the cleanup level development process, including:
  - Regulatory authority
  - Future land use assumptions
  - Site conceptual models
  - Computer models or risk equations
  - Selected input parameters
  - Modifying factors, such as ALARA

Case Studies - Conclusions:

- Variation in health assessment approaches (risk & dose) leads to variation in assessed risk.
- Consistency within given risk assessment approaches is a worthwhile and achievable goal for agencies charged with conducting risk assessments of radioactively-contaminated sites.
- Training would help lend consistency to assessment of risks and would greatly assist in application of updated guidance.

Current Activities

- **Radiation Risk Training**
  - Builds on the findings of the Cleanup Levels Case Studies document
  - In cooperation with EPA Superfund Office
  - Web-based training
  - Focuses on EPA's new Radiation Risk/Dose Calculator and CERCLA risk goal requirements
  - Four Modules:
    1. Regulatory Background
    2. Radiation Risk Approaches
    3. Preliminary Remediation Goals Calculator
    4. Exercise in Application

Current Activities

- Long-Term Stewardship Technology Survey
  - State-led survey of state regulators' perspectives on LTS technology and implementation challenges – in coordination with DOE's LTS Science & Technology Roadmap
  - Key Observations and Conclusions from the Survey would be presented at an Interagency workshop: "Long-Term Stewardship Technology Challenges: State Perspectives and Federal Initiatives" – Thursday, Nov. 7 at 1:00 pm

Future Plans

- Guidance document on a Long-Term Stewardship technology identified by the LTS Technology survey
- LTS Technology Training
- Characterization Technologies guidance document
- Produce and present web-based radiation risk training in cooperation with EPA's Superfund Office

DNAPLs Team

Eric Hausamann (NYSDEC)

Ana Vargas (ADEQ)

Mike Smith (VDEC)

Team Composition

- State members – 16
- Stakeholders – 2
- Federal members – 12
- Consultants/practitioners – 19

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49 active members

Mission Description

Our team mission is to educate regulators and decision-makers about the “DNAPL Challenge” while highlighting the potential benefits of DNAPL mass removal

DNAPL Challenge

- How to detect and remediate DNAPL sources
- Will partial source removal result in a proportional reduction in risk?
- If still above MCL's after remediation, was it worth the effort?

Current Activities

- Tech/Reg Document Preparation
  - Surfactant/Co-Solvent Flushing Tech/Reg Guidelines
  - Introduction to DNAPL Site Characterization Strategies
  - Measuring the Performance of In Situ Thermal Remediation: Case Studies

Future Plans

- Explore New Problem Areas:
  - Performance verification of DNAPL source reduction technologies
  - Phased treatment approaches
- Internet Training
  - Surfactant /co-solvent flushing
  - Characterization strategies

Recent Accomplishments

- Products to date
  - Technology Overview (June 2000)
  - “Facing the Challenge” (April 2002)
- Collaboration with various federal agencies and experts on DNAPL issues
  - FeDTIP and IDC
  - EPA’s Technical Support Project
  - US Army Corps
  - Third party reviewers