



Natural and Enhanced Attenuation for Chlorinated Solvents: New Developments and Tools Agenda and Speakers

June 22, 2009

Morning Session (8:30 am—9:45 am)

Introduction and History: *Karen Vangelas, Savannah River National Laboratory, Project Manager*

Technical Overview: *Brian B. Looney, Savannah River National Laboratory, Project Technical Manager*

Preview of Workshops: *Brian B. Looney*

9:45 am—10:45 am	Field Tools - <i>Karen Vangelas</i>
10:45 am—11:00 am	Break
11:00 am—12:00 pm	Molecular Biological Tools (MBTs) - <i>Brian B. Looney</i>
12:00 pm—1:15 pm	Lunch (on your own)
1:15 pm—2:15 pm	Co-metabolism and Sustainability - <i>Brian B. Looney</i>
2:15 pm—3:45 pm	cVOC Decision Analysis Tool - <i>Dawn Kaback, AMEC Geomatrix, Inc.</i>
3:45 pm—4:00 pm	Open Discussion
4:00 pm	Adjourn for the Day

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Workshops Continue

8:30 am—9:30 am	Scenarios - <i>Mike Truex, Pacific Northwest National Laboratory and Brian B. Looney</i>
9:30 am—10:30 am	BIOBALANCE - <i>Roopa Kamath, GSI Environmental Inc. and Brian B. Looney</i>
10:30 am—10:45 am	Break
10:45 am—11:45 am	Numerical Modeling and Flux Calculation for MNA and Enhanced Attenuation - <i>Mike Truex</i>
11:45 am—12:30 pm	Lunch
12:30 pm—1:30 pm	Hands-on Introduction to the BIOBALANCE model - <i>Roopa Kamath and Brian B. Looney</i>
1:30 pm—2:00pm	Closing Statements
2:00 pm	Adjourn



Natural and Enhanced Attenuation for Chlorinated Solvents: New Developments and Tools



The Department of Energy's Office of Environmental Management's Office of Groundwater and Soil Remediation and the Savannah River National Laboratory invite you to attend a seminar that introduces processes and tools developed by a national team of scientists challenged to identify and then develop the "next generation" tools to support the implementation of attenuation based remedies at chlorinated solvent contaminated sites. Attendees will be introduced to the latest information related to attenuation based remedies for sites contaminated with chlorinated solvents. By attending this meeting you will get ahead of the curve on topics incorporated into newly released technical regulatory guidance by the Interstate Technology Regulatory Council. Though many of the new tools are specific for chlorinated solvents, the three main technical concepts discussed are transferable to metals and radionuclides.

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The first day of the seminar will provide an overview of the main concepts developed and technology advancements followed by three workshops that provide detailed information on new field tools and a decision analysis tool. The day concludes with a hands-on introduction to the decision analysis tool. Emphasis is on practical application of these tools.

Topics to be presented in the overview session are:

- Review of Seminar Objectives and Goals
- Summary of Collaborative Work with ITRC and ITRC Products
- Overview of New Processes, Tools, and Products
- Examples and Case Studies that emphasize the relevance to waste unit characterization and remediation actions and decisions (How the new processes, tools, and products can be integrated into a site's remediation process.).

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The second day of the seminar continues with workshops. These workshops provide detailed information on a tool very similar to a taxonomic key that guides the user in planning an evaluation of a site where MNA is being considered and on two mathematical tools. This day ends with a hands-on session devoted to BioBalance. Example problems will be worked. This session will be led by the developers of these tools.

See Page 2 for Workshop Descriptions

Location and Date

US EPA Region 8
1595 Wynkoop St.
2nd Floor Conference Center
Denver, CO 80202

June 22 and 23, 2009

Attendance is limited to the first
45 registrants.

For information, contact:

Kathleen T. Graham
ORD Superfund and Technology Liaison at
(303)312-6137 or
graham.kathleen@epa.gov

Registration: There is no registration fee.
However, participants are requested to
register. Please indicate the days on which
you plan to attend.

The web site for registration is [http://
www.trainex.org/](http://www.trainex.org/)

Who Should Attend

Environmental technical professionals, regulators, managers responsible for site remediation efforts, and parties interested in the use of attenuation based remedies.

Workshop Descriptions

Field Tools – This workshop will present several of field tools for measuring key parameters used in selecting and evaluating Monitored Natural Attenuation (MNA) and Enhanced Attenuation (EA). Included will be push-pull aquifer tests used for estimating attenuation rates, an oxygen sensor that was developed for oceanographic purposes and is an improvement over the current methods for long-term measuring of dissolved oxygen, and a method to measure contaminant flux in a groundwater monitoring well called the “passive flux meter”.

Molecular Biological Tools (MBTs) – This workshop will present a summary of the developments associated with MBTs, both in this project and by other programs. There will be discussions occurring around MBTs that provide information on *Dehalococcoides* species associated with the reductive dechlorination of tetrachloroethene and trichloroethene. In addition, progress being made by researchers on developing MBTs and associated probes for other biological mechanisms, such as aerobic and co-metabolic processes will be reported. Participants will engage in several scenario-based exercises designed to illustrate the advantages and limitations of MBT data. How information gained from MBT analyses can be integrated into the overall MNA/EA decision making/implementation process will be emphasized.

Large and Dilute Plumes of Chlorinated Solvents – Natural Attenuation in a “Hostile” Environment? EPA has developed clear guidelines related to natural attenuation. These require multiple lines of evidence to document that known attenuation processes are occurring at sufficient rates to achieve remediation goals in a timely manner and that the identified processes are sustainable. Recent scientific efforts support this general approach for all types of sites, even some aerobic sites where natural attenuation processes are relatively slow.

cVOC Decision Analysis Tool – A tool based on a structured analytic approach for comparing alternative remedial approaches at sites containing groundwater contaminated with cVOCs. The analytic approach is based on multiple-attribute utility analysis, which balances competing objectives through application of value judgments re-

flecting tradeoffs the decision-makers are willing to make between those objectives. The tool was designed as a user-friendly spreadsheet that will be useful at sites with any type of ongoing treatment and will give fair consideration to EA and MNA alternatives. Some inputs to this tool will be the outputs from analytical (e.g., BIOBALANCE) or numerical (e.g., RT3D) models. **An interactive training session will be held the afternoon of June 22 using this tool.**

Scenarios - A guide to provide practitioners with an appropriate level of site specificity to assist in planning/supporting characterization, modeling, and implementation of MNA and Enhanced Attenuation. The tool consists of a user’s guide and 13 scenarios built around site geochemical and hydrogeologic conditions. The Scenarios package contains a significant amount of up-to-date information to support evaluation and implementation of MNA and Enhanced Attenuation.

Numerical Modeling and Flux Calculation for MNA/EA - A reactive transport model applied as a tool for evaluation and implementation of MNA/EA. The materials developed include reaction modules for complex chlorinated solvent reactions and a software utility designed to provide modeling results in terms of mass flux to support mass balance evaluations. Documentation provides guidance and information for using numerical models for MNA/EA. The workshop will include applying the tools to a case study. The specific tools are for the MODFLOW-based RT3D reactive transport code, but much of the numerical modeling information could also be applied on other modeling platforms.

BIOBALANCE – A model based on the BIO-CHLOR model. This model provides users a tool that calculates plume growth over time, providing an estimate of when a plume will reach its greatest length. For reductive degradation, this model also evaluates how much electron donor is needed to overcome competing electron acceptors in the system to sustainably degrade the contaminant of interest. BIOBALANCE supports early choices of potentially viable MNA and bio-stimulation options. **A hands-on training session will be held the afternoon of June 23 using this tool.**