



Product List

April 2009

IITRC documents and other products listed below are available on the IITRC Web site at <http://www.iitrcweb.org>.

Document types are shown using the following codes:
G Technical/Regulatory Guidance
O Technical or Regulatory Overviews
C Case Studies
X Other

Doc. #	Title	Description	Type	Partners
Accelerated Site Characterization (ASC)				
ASC-1	<i>IITRC/ASTM Partnership for Accelerated Site Characterization—FY-97 Summary Report</i> (December 1997)	IITRC review and input on <i>ASTM Guide for Expedited Site Characterization of Hazardous Waste</i> and report on the options for future collaboration between IITRC and ASTM.	O	American Society for Testing and Materials (ASTM)
ASC-2	<i>IITRC/USEPA Consortium for Site Characterization Technology Partnership—FY-97 Summary Report</i> (January 1998)	State participation in the USEPA verification of PCB field analytical and well-head monitoring and soil and soil-gas sampling technologies.	O	USEPA
ASC-3	<i>Multi-State Evaluation of an Expedited Site Characterization Technology: Site Characterization and Analysis Penetrometer System—Laser-Induced Fluorescence (SCAPS—LIF)</i> (May 1996)	California certification, USEPA verification, and multi-state acceptance of the SCAPS sensor for in situ subsurface field screening method for polynuclear aromatic hydrocarbons.	G	U.S. Navy, Army, and Air Force
ASC-4	<i>Multi-State Evaluation of the Site Characterization and Analysis Penetrometer System—Volatile Organic Compounds (SCAPS—VOC) Sensing Technologies</i> (December 1997)	Evaluation and approval of SCAPS-deployed hydrosparge VOC sensor for real-time in situ detection of VOCs below the water table.	G	U.S. Army Corps of Engineers, Waterways Experimental Station
Alternative Landfill Technologies (ALT)				
ALT-1	<i>Technology Overview Using Case Studies of Alternative Landfill Technologies and Associated Regulatory Topics</i> (March 2003)	Presents examples of flexibility in regulatory approval of alternative landfill covers, research about the use of alternative covers, and examples of approved designs and constructed covers.	O	
ALT-2	<i>Technical and Regulatory Guidance for Design, Installation, and Monitoring of Alternative Final Landfill Covers</i> (December 2003)	Focuses on the decisions and facilitating the decision processes related to design, evaluation, construction, and post-closure care associated with alternative final landfill covers.	G	
ALT-3	<i>Technical and Regulatory Guidance for Characterization, Design, Construction, and Monitoring of Bioreactor Landfills</i> (February 2006)	Guidance for decision makers associated with plan development, review, and implementation of bioreactor landfills.	G	
ALT-4	<i>Evaluating, Optimizing, or Ending Post-Closure Care at MSW Landfills Based on Site-Specific Data Evaluation</i> (September 2006)	Describes a systematic and hierarchical evaluation method for post-closure care performance based on criteria established for a defined end-use strategy.	G	
Bioremediation of Dense, Nonaqueous-Phase Liquids (BIODNAPL)				
BIODNAPL-1	<i>Overview of In Situ Bioremediation of Chlorinated Ethene DNAPL Source Zones</i> (October 2005)	Overview of in situ bioremediation and some of the issues to consider when selecting and designing an ISB system for remediation of chlorinated ethene DNAPLs source zones.	O	
BIODNAPL-2	<i>In Situ Bioremediation of Chlorinated Ethene DNAPL Source Zones: Case Studies</i> (April 2007)	Presents six critically reviewed case studies of recent or ongoing applications ISB of DNAPLs as evidence that it is a viable cleanup strategy.	C	
BIODNAPL-3	<i>In Situ Bioremediation of Chlorinated Ethene: DNAPL Source Zones</i> (June 2008)	Provides a systematic understanding of the technical and related regulatory considerations for ISB of chlorinated ethene DNAPL source zones, based on scientifically sound and credible evidence.	G	

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Brownfields (BRNFLD)				
BRNFLD-1	<i>Vapor Intrusion Issues at Brownfield Sites</i> (December 2003)	An overview of vapor intrusion, contaminant types with vapor intrusion potential, brownfield sites' potential for indoor air exposure from vapor intrusion, and steps that can limit exposures.	O	
BRNFLD-2	<i>Property Revitalization – Lessons Learned from BRAC and Brownfields</i> (January 2006)	An overview of incentives and tools used to accelerate the cleanup and reuse of brownfield and BRAC sites. Also includes case studies.	O	
BRNFLD-3	<i>An Overview of Land Use Control Management System</i> (December 2008)	An overview of the various available systems and programs that track, monitor, and/or inform about land use controls.	O	
Dense, Nonaqueous-Phase Liquids (DNAPLs)				
DNAPLs-1	<i>Dense Nonaqueous-Phase Liquids: Review of Emerging Characterization and Remediation Technologies</i> (June 2000)	Reviews three types of emerging characterization technologies and two categories of emerging remediation technologies.	O	
DNAPLs-2	<i>DNAPL Source Reduction: Facing the Challenge</i> (April 2002)	Summarizes current regulatory attitudes regarding DNAPL source zone remediation and outlines the pros and cons of partial source removal.	O	
DNAPLs-3	<i>Technical and Regulatory Guidance for Surfactant/Cosolvent Flushing of DNAPL Source Zones</i> (April 2003)	Summarizes information needed by regulators and others in selecting and evaluating design and implementation work plans for surfactant and cosolvent flushing of DNAPLs.	G	
DNAPLs-4	<i>An Introduction to Characterizing Sites Contaminated with DNAPLs</i> (September 2003)	Discusses scientific approaches and strategies used to characterize sites that are known, or suspected, to be contaminated with DNAPLs.	O	
DNAPLs-5	<i>Strategies for Monitoring the Performance of DNAPL Source Zone Remedies</i> (August 2004)	Presents approaches to performance monitoring of various in situ technologies for treating DNAPL source zones	G	
Diffusion/Passive Samplers (DSP)				
DSP-1	<i>User's Guide for Polyethylene-Based Passive Diffusion Bag Samplers to Obtain Volatile Organic Compound Concentrations in Wells</i> (March 2001)	A jointly developed protocol for determining when, where, and how to use diffusion samplers for groundwater sampling.	G	U.S. Geological Survey, Navy, Air Force, USEPA
DSP-2	<i>ITRC Diffusion Sampler Resource CD, Ver. 3</i> (July 2004)	Contains DSP-3, nearly 80 articles and presentations on various diffusion samplers, a two-hour training video, and an AFCEE/Parsons field sampling video.	X	
DSP-3	<i>Technical and Regulatory Guidance for Using Polyethylene Diffusion Bag Samplers to Monitor Volatile Organic Compounds in Groundwater</i> (February 2004)	Guidance for regulators, technology users, and stakeholders to facilitate the use of polyethylene diffusion bag sampling, particularly for long-term monitoring, including applicability and regulatory issues, a cost model, and case histories.	G	
DSP-4	<i>Technology Overview of Passive Sampler Technologies</i> (March 2006)	Overview of 12 passive sampling technologies, describing each one's basis of operation, applications, advantages, limitations, and development status.	O	
DSP-5	<i>Protocol for Use of Five Passive Samplers to Sample for a Variety of Contaminants in Groundwater</i> (February 2007)	Provides guidance on how to properly deploy and collect samples using five passive sampling technologies.	G	
Ecological Enhancements (ECO)				
ECO-1	<i>Making the Case for Ecological Enhancements</i> (January 2004)	Presents white paper and case studies on natural alternatives to traditional remediation processes.	C	Wildlife Habitat Council
ECO-2	<i>Planning and Promoting Ecological Land Reuse of Remediated Sites</i> (July 2006)	Promotes ecological land reuse as an integral part of site remediation strategies and an alternative to conventional property development/redevelopment.	G	
Enhanced Attenuation: Chlorinated Organics (EACO)				
EACO-1	<i>Enhanced Attenuation: Chlorinated Organics</i> (April 2008)	Provides direction to regulators and practitioners on integrating EA into remedial decision making for a smooth transition between aggressive remediation and monitored natural attenuation.	G	
Enhanced In Situ Bionitrification (EISBD)				
EISBD-1	<i>Emerging Technologies for Enhanced In Situ Bionitrification (EISBD) of Nitrate-Contaminated Ground Water</i> (June 2000)	Describes nitrate in the environment, sources, environmental and health effects, current remediation practices, and the emerging technology of EISBD.	O	

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In Situ Bioremediation (ISB)				
ISB-1	<i>Case Studies of Regulatory Acceptance of ISB Technologies</i> (February 1996)	Case studies of the regulatory barriers and implementation of in situ bioremediation in six states.	C	Colorado Center for Environmental Management
ISB-2	<i>ISB Protocol Binder & Resource Document for Hydrocarbons</i> (June 1996) (re-released September 1998)	General protocol and outline for ISB and literature review for natural attenuation and bioventing of petroleum hydrocarbons.	G	
ISB-3	<i>Natural Attenuation of Chlorinated Solvents in Groundwater: Principles and Practices</i> (reprinted September 1999)	Description of practices to be used to recognize and evaluate the presence of natural attenuation of chlorinated solvent contamination.	G	Industrial members of the RTDF
ISB-4	<i>ITRC/ISB Closure Criteria Focus Group Report</i> (March 1998)	Evaluation of state practices for establishing and implementing closure criteria for bioventing, vapor extraction, and natural attenuation of petroleum hydrocarbons and chlorinated solvents.	O	RTDF industrial members
ISB-5	<i>Cost & Performance Reporting for In Situ Bioremediation Technologies</i> (December 1997)	Template for obtaining and reporting cost and performance information about the use of in situ bioremediation.	G	RTDF industrial members
ISB-6	<i>Technical and Regulatory Requirements for Enhanced In Situ Bioremediation of Chlorinated Solvents in Groundwater</i> (December 1998)	Presents and discusses regulatory processes appropriate to a variety of active bioremediation techniques for chlorinated solvents in groundwater.	G	RTDF industrial members, DOD
ISB-7	<i>Five-Course Evaluation Summary for the ITRC/RTDF Training Course: Natural Attenuation of Chlorinated Solvents in Groundwater</i> (September 1999)	Presents a summary of results of surveys returned by people who took the natural attenuation course.	X	RTDF industrial members
ISB-8	<i>A Systematic Approach to In Situ Bioremediation in Groundwater</i> (August 2002)	Presents flow paths for defining parameters and criteria leading to decisions for deploying ISB, with decision trees for evaluating ISB for treating nitrates, carbon tetrachloride, and perchlorate.	G	
In Situ Chemical Oxidation (ISCO)				
ISCO-1	<i>Technical and Regulatory Guidance for In Situ Chemical Oxidation of Contaminated Soil and Groundwater</i> (June 2001)	Discusses capabilities, limitations, costs, regulatory concerns, and data requirements for using ISCO to remove or destroy BTEX, chlorinated VOCs, PAHs, and chlorinated SVOCs.	G	
ISCO-2	<i>Technical and Regulatory Guidance for In Situ Chemical Oxidation of Contaminated Soil and Groundwater, Second Edition</i> (January 2005)	Provides a more comprehensive discussion on chemical oxidants than the first edition, along with a more detailed presentation of some of the key concepts of remedial design.	G	
LNAPLs (LNAPL)				
LNAPL-1	<i>Evaluating Natural Source Zone Depletion at Sites with LNAPL</i> (April 2009)	Provides a technical overview of NSZD for LNAPLs, addressing the processes involved, assessing their rates, and predicting long-term progress.	O	
Metals in Soils (MIS)				
MIS-1	<i>Technical and Regulatory Guidelines for Soil Washing</i> (December 1997)	Technical requirements for using soil washing technologies.	G	DOE
MIS-2	<i>Fixed Facilities for Soil Washing: A Regulatory Analysis</i> (December 1997)	A case study of fixed facilities for soil washing in the United States and in other countries for identifying successful models of deployment.	C	RTDF IINERT Technology Team
MIS-3	<i>Emerging Technologies for the Remediation of Metals in Soils: In Situ Stabilization/Inplace Inactivation</i> (December 1997)	Three separate status reports on technologies for the treatment of metals in soils and the potential regulatory issues associated with their use.	O	RTDF, USEPA
MIS-4	<i>Electrokinetics</i> (December 1997)			
MIS-5	<i>Phytoremediation</i> (December 1997)			
MIS-6	<i>Metals in Soils 1998 Technology Status Report: Soil Washing and the Emerging Technologies of Phytoremediation, Electrokinetics, and In Situ Stabilization/In Place Inactivation</i> (December 1998)	Updates the five previous documents.	O	
MTBE and Other Fuel Oxygenates (MTBE)				
MTBE-1	<i>Overview of Groundwater Remediation Technologies for MTBE and TBA</i> (February 2005)	Describes established and emerging technologies for remediating groundwater containing methyl <i>tert</i> -butyl ether and <i>tert</i> -butyl alcohol.	O	

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Perchlorate (PERC)				
PERC-1	<i>Perchlorate: Overview of Issues, Status, and Remedial Options</i> (September 2005)	Discusses sources, contamination, analytical methodologies, toxicological issues and research, remediation technologies and regulatory status.	O	
PERC-2	<i>Remediation Technologies for Perchlorate Contamination in Water and Soil</i> (March 2008)	Reviews technologies for remediating perchlorate-contaminated water and soil, as well as barriers to their deployment, providing guidance to help streamline processes to select and implement them.	G	
Permeable Reactive Barriers (PRB, formerly PBW)				
PBW-1	<i>Regulatory Guidance for Permeable Reactive Barriers Designed to Remediate Chlorinated Solvents</i> (2 nd Edition, December 1999)	Review of regulatory issues associated with permeable reactive barriers.	G	RTDF
PBW-2	<i>Design Guidance for Application of Permeable Reactive Barriers for Groundwater Remediation</i> (March 2000)	U.S. Air Force document revised with state input to provide technical information for PRB installation.	G	Air Force Environics Directorate, Armstrong Lab, Battelle
PRB-3	<i>Regulatory Guidance for Permeable Reactive Barriers Designed to Remediate Inorganic and Radionuclide Contamination</i> (September 1999)	Provides regulatory guidelines for the installation of permeable reactive barriers for the remediation of inorganics and radionuclides.	G	RTDF
PRB-4	<i>Permeable Reactive Barriers: Lessons Learned/New Directions</i> (February 2005)	Provides updated information on new developments and innovative approaches in applying PRBs to treat a variety of groundwater contaminants.	G	
Phytotechnologies (PHYTO)				
PHYTO-1	<i>Phytoremediation Decision Tree</i> (December 1999)	A tool for determining the applicability of phytoremediation at a given site.	X	USEPA
PHYTO-2	<i>Phytotechnology Technical and Regulatory Guidance Document</i> (April 2001)	Identifies key regulatory and technical issues relevant to the implementation of phytoremediation.	G	
PHYTO-3	<i>Phytotechnology Technical and Regulatory Guidance and Decision Trees, Revised</i> (February 2009)	Updates and replaces PHYTO-1 and PHYTO-2, merging their concepts with new, practical information on the process and protocol for selecting and applying various phytotechnologies as remedial alternatives.	G	
Plasma Technologies (PT)				
PT-1	<i>A Regulatory Overview of Plasma Technologies</i> (June 1996)	General description of plasma technology and regulatory pathways for permitting.	O	
Policy (POL)				
POL-1	<i>An Analysis of Performance-Based Systems for Encouraging Innovative Environmental Technologies</i> (December 1997)	Case studies of performance-based environmental regulatory and contracting practices and an analysis of activities that could encourage development and deployment of innovative technologies.	C	U.S. Army Environ. Policy Institute, DOD (ES), INEEL
POL-2	<i>Case Studies of Selected States' Voluntary Cleanup/Brownfields Programs</i> (September 1997)	In-depth case studies of selected states' voluntary cleanup/brownfields programs and recommendations for possible enhancements.	C	Colo. Center for Env. Mgmt., ASTSWMO
Radionuclides (RAD)				
RAD-1	<i>Radiation Reference Guide: Relevant Organizations and Regulatory Terms</i> (December 1999)	Resource of organizations, activities, and technical terminology related to radioactive contamination.	X	
RAD-2	<i>Determining Cleanup Goals at Radioactively Contaminated Sites: Case Studies</i> (April 2002)	Summarizes the various regulatory standards and requirements dictating the cleanup of radioactively contaminated sites, processes for developing cleanup levels and, case studies from 12 sites.	C	
RAD-3	<i>Issues of Long-Term Stewardship: State Regulators' Perspectives</i> (July 2004)	Presents the results of the survey of state regulator perspectives on long-term stewardship.	O	
RAD-4	<i>Real-Time Measurement of Radionuclides in Soil: Technology and Case Studies</i> (February 2006)	Provides overview of the benefits of a streamlined data collection approach that has proven effective at radionuclide contaminated sites.	O	
RAD-5	<i>Decontamination and Decommissioning of Radiologically Contaminated Facilities</i> (January 2008)	Compiles knowledge and experience acquired from facilities that have completed D&D, providing guidance to regulators, the public, project managers, cleanup contractors, and technology providers.	G	

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Remediation Process Optimization (RPO)				
RPO-1	<i>Remediation Process Optimization: Identifying Opportunities for Enhanced and More Efficient Site Remediation</i> (September 2004)	Provides guidance on how to systematically evaluate and manage uncertainty associated with the remediation process by using RPO as a tool.	G	
RPO-2	<i>Life-Cycle Cost Analysis</i> (March 2006)	Introduces the reader to the basic concepts of life-cycle cost analysis and "walks" the practitioner through the life-cycle analysis process as examples.	O	
RPO-3	<i>Exit Strategy—Seeing the Forest Beyond the Trees</i> (March 2006)	Reviews the concept and advantages of performance-based exit strategies as one element of performance-based management (PBM).	O	
RPO-4	<i>Aboveground Treatment Technologies</i> (March 2006)	Introduces the basic concepts of optimization of aboveground technologies. Provides a general overview of some common optimization opportunities found for aboveground treatment systems for extracted groundwater, air sparging/soil vapor extraction, and multiphase extraction.	O	
RPO-5	<i>Data Management, Analysis and Visualization Techniques</i> (March 2006)	Introduces the basic concepts of data management, analysis and visualization techniques which are important tools in successfully measuring the progress of remediation or a monitoring program.	O	
RPO-6	<i>Performance-Based Management</i> (March 2006)	Introduces basic concepts of performance-based management by presenting a combination of eight project management resources linked by a communication hub.	O	
RPO-7	<i>Improving Environmental Site Remediation Through Performance-Based Environmental Management</i> (November 2007)	Explains performance-based environmental management process concepts and components and discusses regulatory and stakeholder perspectives.	G	
Risk (RISK)				
RISK-1	<i>Examination of Risk-Based Screening Values and Approaches of Selected States</i> (December 2005)	Summarizes the results of a survey of 13 states' practices for developing and applying risk-based screening for five target compounds: arsenic, benzo(a)pyrene, lead, polychlorinated biphenyls and trichloroethene	X	
RISK-2	<i>Use of Risk Assessment in Management of Contaminated Sites</i> (August 2008)	Through actual and hypothetical case studies, examines state regulatory agencies' use of risk assessment and risk-related practices in managing contaminated sites.	O	
Sampling, Characterization and Monitoring (SCM)				
SCM-1	<i>Technical and Regulatory Guidance for the Triad Approach: A New Paradigm for Environmental Project Management</i> (December 2003)	Introduces the Triad approach to conducting environmental work, which increases effectiveness and quality and reduces project costs.	G	
SCM-2	<i>The Use of Direct-push Well Technology for Long-term Environmental Monitoring in Groundwater Investigations</i> (March 2006)	Provides guidance concerning the use of Direct Push wells for long-term environmental groundwater monitoring.	G	
SCM-3	<i>Triad Implementation Guide</i> (May 2007)	Provides guidance for environmental organizations that want to implement the EPA Triad process into their business practices	O	
Small Arms Firing Range (SMART)				
SMART-1	<i>Characterization and Remediation of Soils at Closed Small Arms Firing Ranges</i> (January 2003)	Provides decision diagram and guidance for planning, evaluating, and approving lead soil remediation systems.	G	
SMART-2	<i>Environmental Management at Operating Outdoor Small Arms Firing Ranges</i> (February 2005)	Assists range operators in developing, using, and monitoring environmental management plans to minimize potential exposure to metals, especially lead, at active outdoor small arms firing ranges.	G	

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Thermal Desorption (TD)				
TD-1	<i>Technical Requirements for On-Site Low Temperature Thermal Desorption of— Non-Hazardous Soils Contaminated with Petroleum/Coal Tar/Gas Plant Wastes</i> (December 1997)	These three reports serve as the protocol for minimum technical requirements and can be used together when treating a mix of contaminants.	G	DOE Mixed Waste Focus Area
TD-2	<i>Solid Media Contaminated with Hazardous Chlorinated Organics</i> (September 1997)			
TD-3	<i>Solid Media and Low Level Mixed Waste Contaminated with Mercury and/or Hazardous Chlorinated Organics</i> (September 1998)			
Unexploded Ordnance (UXO)				
UXO-1	<i>Breaking Barriers to the Use of Innovative Technologies: State Regulatory Role in Unexploded Ordnance Detection and Characterization Technology Selection</i> (December 2000)	Using case studies, this document recommends including states in the selection of technologies for detecting and characterizing unexploded ordnance.	C	
UXO-2	<i>Technical/Regulatory Guideline for Munitions Response Historical Records Review</i> (November 2003)	A guide for regulators, stakeholders, and others involved in oversight or review of munitions response historical records review projects on munitions response sites.	G	
UXO-3	<i>Geophysical Prove-Outs for Munitions Response Projects</i> (November 2004)	Introduces the purpose and scope of GPOs, provides examples of associated goals and objectives, and presents information needed to understand and evaluate the design, construction, implementation and reporting of GPOs.	G	
UXO-4	<i>Survey of Munitions Response Technologies</i> (June 2006)	An overview of the current status of technologies used for munitions response actions that, where possible, evaluates and quantifies their performance capabilities.	O	ESTCP and SERDP
UXO-5	<i>Quality Considerations for Munitions Response Projects</i> (October 2008)	Provides guidance to environmental regulators on how to define quality, systematically plan for and achieve quality results, and apply these concepts to processes common to munitions response projects.	G	
Vapor Intrusion (VI)				
VI-1	<i>Vapor Intrusion Pathway: A Practical Guideline</i> (January 2007)	Provides a framework for evaluating the VI pathway and describes tools available for investigation, data evaluation, and mitigation	G	
VI-1A	<i>Vapor Intrusion Pathway: Investigative Approaches for Typical Scenarios (A Supplement to VI-1)</i> (January 2007)	Describes applicable approaches for evaluating the VI pathway in six typical scenarios	C	
Verification (VT)				
VT-1	<i>Multi-State Evaluation of Elements Important to the Verification of Remediation Technologies, 2nd Edition</i> (December 1999)	A matrix of data requirements for a technology verification process to enhance states' confidence in the technology verification and demonstration results. Use of this matrix will allow verification programs to modify their efforts and provide the data most needed by states in their approval process. This type of data collection will encourage states to consider reciprocal state acceptance of verification efforts. Highlights of the verification programs are also provided.	G	Eleven North American verification programs, DOE, USEPA
Wetlands (WTLND)				
WTLND-1	<i>Technical and Regulatory Guidance for Constructed Treatment Wetlands</i> (December 2003)	A guide to help regulators, consultants, and stakeholders make informed decisions about the use of constructed treatment wetland systems for remediating a variety of waste streams, including acid mine water, remedial wastewaters, and agriculture waste streams.	G	
WTLND-2	<i>Characterization, Design, Construction, and Monitoring of Mitigation Wetlands</i> (February 2005)	A guide to the appropriate characterization, design, construction, and monitoring of compensatory mitigation wetlands as part of a federal, state, or local permitting requirement.	G	