



Resources for Strategic Site Investigation and Monitoring

EPA, in concert with other federal agencies and state organizations, is accelerating the development of policies and information to support ***Strategic Investigation and Monitoring*** activities at hazardous waste sites. These efforts are meant to assist site decision makers as they transition to newer, streamlined approaches. A fuller description of the emphasis on these approaches is described in a fact sheet entitled “Improving Sampling, Analysis, and Data Management for Site Investigation and Cleanup” (EPA 542-F-01-030a). The educational, training, and guidance resources described below either already exist or are under development to support project managers seeking to apply these approaches.

General Information

Available Technologies

- ★ *Field Analytical Technologies Encyclopedia* (FATE). Provides information on theory of operation, strengths, weaknesses, and general operating costs for selected technology classes and vendors.
<http://fate.clu-in.org>
- ★ Remediation and Characterization Innovation Technologies provides searchable (by analyte, location, instrumentation) database of commercial technology vendors.
<http://epareachit.orgv>
- ★ Site Characterization and Analysis Penetrometer System (SCAPS). Provides general information on operation of SCAPS and available sensors. <http://aec.army.mil/prod/usaec/et/scaps/success.htmV>
- ★ *Field Sampling and Analysis Technologies Matrix*. Contains general descriptions of equipment and rates them according to a variety of characteristics (e.g., analyte of interest, media, ease of use, relative cost).
<http://www.frtr.gov/site>
- ★ Center for Public Environmental Oversight. Provides a searchable database of characterization and remediation technology descriptions.
<http://www.cpeo.org/techtree/about.htm>
- ★ *Field Analytical Measurement Technologies, Applications, and Selection* (produced by California Military Environmental Coordination Committee and EPA Region 9). Provides general discussion of applicability of field instrumentation to site characterization with appendices that discuss various vendor equipment (including cost and throughput).
<http://www.epa.gov/region09/qa/r9-qadocs.html>

Case Studies/Technology Use

- ★ Case studies of applications of technologies and streamlined strategies.
http://www.clu-in.org/char1_edu.cfm
- ★ Case studies of demonstrations and applications of technologies and streamlined strategies at Federal facilities (Department of Defense (DoD), Department of Energy (DOE), and Environment Protection Agency (EPA)). <http://www.frtr.gov/cost>

Program-Provided Guidance Documents

- ★ EPA *Waste Methods Guidance* (SW-846). Contains methods for sample preparation and analysis of various chemicals by fixed laboratory methods as well as some field analytical methods such as immunoassays. <http://www.epa.gov/epaoswer/hazwaste/test/sw846.htm>
- ★ EPA Environmental Response Team. Provides technical links, list of technical assistance contacts, response training course information, and downloadable publications such as Field Analytical Standard Operating Procedures (SOPs). <http://www.ert.org/>
- ★ *Expedited Site Assessments for Underground Storage Tank Sites* guidance document. <http://www.epa.gov/swerust1/pubs/index.htm>
- ★ EPA waste programs' performance-based measurement systems (PBMS) implementation plan. <http://www.epa.gov/epaoswer/hazwaste/test/pbms.htm>
- ★ *Guidance for Data Useability in Risk Assessment* (Parts A & B). Guidance designed to provide data users with a nationally consistent basis for making decisions about the minimum quality and quantity of environmental analytical data that are sufficient to support Superfund decisions. Download from <http://www.epa.gov/oerrpage/superfund/programs/risk/tooltrad.htm#gp>
- ★ Site Characterization Library Volume 1, Release 2. EPA/600/C-98/001. CD-ROM developed by the EPA's National Exposure Research Laboratory. It contains a variety of electronic documents and computer programs related to the characterization of hazardous waste sites. For copies, contact (800) 490-9198 or (513) 489-8190 or fax your request to (513) 891-6685.
- ★ U.S. Army Corps of Engineers' (USACE) Headquarters Library of Engineering Manuals. Provides a list of downloadable USACE-issued manuals, some of which are environmentally oriented. <http://www.usace.army.mil/inet/usace-docs/eng-manuals/em.htm>

Technology Verification and Demonstration

- ★ EPA Environmental Technology Verification (ETV) Program. Provides downloadable reports on the results of testing carried out on, among other things, monitoring and characterization equipment. <http://www.epa.gov/etv/>
- ★ California Environmental Protection Agency Technology Certification Program. Provides downloadable reports on the results of testing carried out on, among other things, SCAPS and online hydrocarbon monitoring. <http://www.calepa.ca.gov/calcert/partner.htm#TechPartnership>
- ★ ETV Canada. Provides abstracts of evaluated technologies and vendor contact information. <http://www.etvcanada.com/>
- ★ DOE Expedited Site Characterization, Ames Laboratory. Provides descriptions of a variety of innovative geophysical and analytical equipment demonstrations as well as a list of publications, some of which are downloadable. <http://www.etd.ameslab.gov/etd/technologies/projects/esc/index.html>

Web Sites with Various Related, Downloadable Publications

- ★ EPA Technology Innovation Office-sponsored Cleanup Information (CLU-IN) web site. Provides wide variety of downloadable reports and updates on characterization and remediation technologies as well as links to other environmental sites. <http://www.clu-in.org/>
- ★ EPA Superfund Dynamic Field Activities Internet Site. Provides resources to support a streamlined, dynamic approach to measurement and monitoring. Resources include information on an upcoming Superfund guidance document and links to resources on numerous field-based analytical and sampling methods. <http://www.epa.gov/superfund/programs/dfa/index.htm>
- ★ DOE Office of Science and Technology. Under "publications" button, provides extensive listing of publications and reports on innovative characterization, monitoring, and sensor technologies. <http://ost.em.doe.gov/>

- ★ Strategic Environmental Research and Development Program (DOE/DOD/EPA). Provides a searchable list of Proceedings citations, but papers are not available. Also provides numerous summary reports on site characterization and project results sponsored by the program. http://www.serdp.org/search/search_directory.html#
- ★ USACE Cold Regions Research and Engineering Laboratory. Provides list of research publications on a wide variety of topics. For environmental topics, the emphasis is on characterization and remediation of explosives. http://www.crrel.usace.army.mil/techpub/CRREL_Reports/
- ★ USACE Waterways Hazardous Waste Research Center. Provides studies published as part of the Installation Restoration Program. Some are related to innovations in monitoring and characterization. <http://www.wes.army.mil/el/elpubs/irrp.html>
- ★ U.S. EPA Laboratory Subsurface Remediation Information Center. Provides reports, issue papers, and research briefs on subsurface characterization and remediation. <http://www.epa.gov/ahaazvuc/publications.html>
- ★ Interstate Technology and Regulatory Cooperation Committee. Provides guidance documents in areas of interest to the committee. <http://www.itrcweb.org/> (click on "Guidance Documents")

Education/Training Courses

- ★ EPA Field-Based Site Characterization Training (FBSCT) Program. Provides 1-, 3-, and 5-day training on technologies and strategies. <http://www.trainex.org/>
- ★ EPA-sponsored *Internet Brownbag Technology Seminars*. Two-hour "workshops" on technology issues available over the Internet. <http://clu-in.org/studio>
- ★ *On-site, Insights* field-based characterization training. <http://www.hsrb.org/> or <http://njcmr.njit.edu/nhsrb/techmenupage.htm>

- ★ EPA on-site interactive training for modeling subsurface petroleum hydrocarbon transport. <http://www.epa.gov/athens/learn2model/index.html>
- ★ DOE Data Quality Objectives (DQO) training workbook and software. Covers topics (remediation, waste disposal) in workbook format and has a reference library section and software (ASSESS, CALTOX, DEFT, GEO-EAS, Elip-Grid). <http://www.hanford.gov/dqo/project/workbook.html>
- ★ EPA Quality Assurance training courses. Provides a listing of currently available quality assurance training courses, some of which are downloadable. Call (202) 564-6883 to inquire about future live courses. <http://www.epa.gov/quality1/trcourse.html>

Software

- ★ Ground-Water Modeling software in the public domain. Contains numerous downloadable modeling programs. <http://www.epa.gov/ada/csamos/models.html>
- ★ Spatial Analysis and Decision Assistance (SADA). Incorporates downloadable tools from environmental assessment fields into an effective problem-solving environment. Tools include integrated modules for visualization, geospatial analysis, statistical analysis, human health risk assessment, cost-effective analysis, sampling design, and decision analysis. <http://www.sis.utk.edu/cis/sada/>
- ★ Critical Path Planning Toolbox. Air Force-sponsored RI project-planning software. <http://www.afcee.brooks.af.mil/er/cppt.htm>
- ★ Fully Integrated Environmental Location Decision Support (FIELDS) software. Integrates geographic information systems, global positioning systems, database, and analytical and imaging technologies to facilitate site characterization decision making. <http://www.epa.gov/region5fields>
- ★ DQO-PRO Software. Used to calculate sampling design grids and tolerable errors in the DQO process. Downloadable at: <http://www.acs-envchem.duq.edu/>

Technical Support

- ★ EPA Superfund Technical Support Program. Web site provides contact information on regional technical personnel in engineering, ground water, and federal facilities and offers assistance in interfacing with the Technical Support Centers and their technical contacts. <http://www.epa.gov/tio/tsp>
- ★ The U.S. Army Environmental Center (USAEC), in partnership with the Naval Explosive Ordnance Technology Division (NAVEODTECHDIV), offers comprehensive technical support for unexploded ordnance (UXO) characterization and remediation efforts. <http://aec-www.apgea.army.mil:8080/prod/usaec/et/uxo/uxo.htm>
- ★ USACE Hazardous, Toxic, and Radioactive Waste Center of Excellence. Provides general information, answers to frequently asked questions, and opportunity to submit technical questions directly. <http://www.environmental.usace.army.mil/info/technical/it/it.html>
- ★ Hazardous Substance Research Centers site. Provides links to five university centers with research primarily in remediation. Some downloadable documents, bibliographic lists of publications, and contact information offered. <http://www.hsrb.org/>

- ★ New England Waste Management Officials Association (NEWMOA). Web site provides consensus opinions on various environmental issues with an emphasis on pollution prevention. Association and state contacts are provided. <http://www.newmoa.org>
- ★ The Brownfields Technology Support Center. Provides information on the Brownfields program and allows submission of technical support requests on-line. <http://www.brownfieldstsc.org/>

Planned Resources

Efforts are underway to develop new decision tools for various practitioners. These efforts include:

- ★ Additional modules for EPA Field-Based Site Characterization Technology training program
- ★ Quality Assurance/Quality Control and Sampling Design Training
- ★ New waste program guidance emphasizing the use of technologies and strategies
- ★ New handbooks for using field methods and dynamic work strategies
- ★ EPA statistical centers of expertise
- ★ Outreach to states through organizations such as NEWMOA and the Interstate Technology Regulatory Cooperation Work Group
- ★ User-created standard operating procedures for field instrumentation
- ★ Inventories of field uses/applications
- ★ Other data bases and on-line information

The “Triad”



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