

Chapter 3

Site Evaluation

Accomplishments

By the end of FY92, more than 36,400 potentially threatening hazardous waste sites or incidents had been reported to EPA for evaluation under Superfund. EPA continued its progress in evaluating and assessing these sites. EPA also proceeded with ongoing efforts to address technical complexities associated with lead and radionuclide contamination, and improved site evaluation guidance.

3.1 SITE ASSESSMENT

The site assessment phase of the Superfund process begins when EPA is notified of a potentially threatening hazardous waste site or incident. The Agency records basic information about the site in the inventory of potentially hazardous waste sites maintained in the CERCLA Information System (CERCLIS), which also tracks further actions and decisions at the site. For sites where there is an immediate threat posed to human health, welfare, or the environment, EPA conducts a removal action to address the threat. For other sites, a two-stage assessment is conducted, consisting of a preliminary assessment (PA) to determine whether a potential threat exists and a site inspection (SI) to determine the relative threat posed and to evaluate the site for possible listing on the National Priorities List (NPL). The NPL is the list of sites having the highest remediation priority.

At any point in the process, EPA may determine that the Superfund evaluation of the site is complete

and that no further steps to list the site on the NPL will be taken. EPA places such sites into the “no further remedial action planned” (NFRAP) category. A NFRAP decision does not necessarily mean that there is no hazard associated with the site; it merely means that, based on available information, the site does not meet the criteria for placement on the NPL. As appropriate, a NFRAP site might be addressed under the Resource Conservation and Recovery Act (RCRA) or other authorities. A Superfund removal action may be taken at a NFRAP site or at any time during the two-stage evaluation process if there is an immediate threat to human health or the environment identified.

As noted in Chapter 1, the Agency is revising the site assessment process in the Superfund Accelerated Clean-Up Model (SACM). SACM will consolidate site assessment functions into a single, continuous process. Chapter 1 provides an overview of the revised process.

3.1.1 The Inventory of Sites (CERCLIS)

When the Agency is notified of a potential site, it records basic information about the site in CERCLIS, the national inventory of potentially threatening hazardous waste sites. EPA is notified of a site in a variety of ways, including through information provided by states, handlers of hazardous materials, and concerned citizens. For example, an individual might report concerns about a particular

| Acronyms Referenced in Chapter 3 | |
|----------------------------------|---|
| CERCLIS | CERCLA Information System |
| DOE | Department of Energy |
| HEAST | Health Effects Assessment Summary Tables |
| HRS | Hazard Ranking System |
| IEUBK | Integrated Exposure Uptake Biokinetic |
| LVF | Las Vegas Facility |
| NAREL | National Air and Radiation Environmental Laboratory |
| NFRAP | No Further Remedial Action Planned |
| NPL | National Priorities List |
| NRC | National Response Center |
| OERR | Office of Emergency and Remedial Response |
| ORD | Office of Research and Development |
| ORIA | Office of Radiation and Indoor Air |
| OSWER | Office of Solid Waste and Emergency Response |
| PA | Preliminary Assessment |
| RAGS | Risk Assessment Guidance for Superfund |
| RCRA | Resource Conservation and Recovery Act |
| RPM | Remedial Project Manager |
| RQ | Reportable Quantity |
| SACM | Superfund Accelerated Clean-Up Model |
| SI | Site Inspection |
| TIB | Toxics Integration Branch |
| TSC | Technical Support Center |
| VORCE | Volume Reduction and Chemical Extraction |

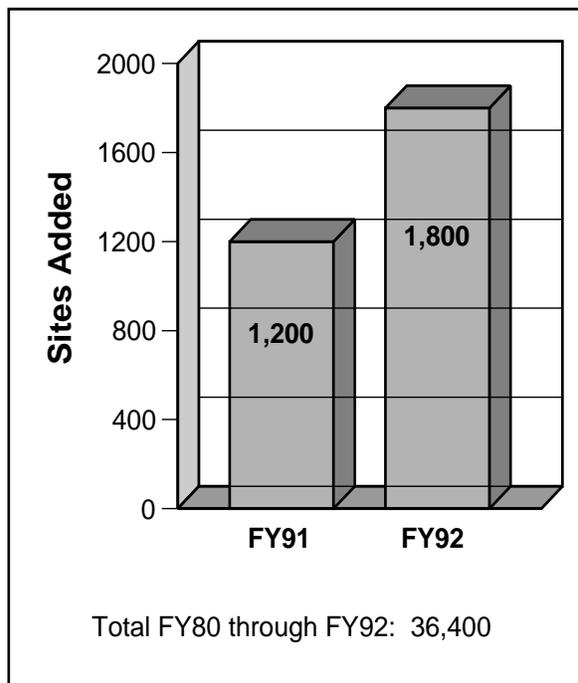
site, or local law enforcement officials may submit a formal report to EPA. Facility managers may also notify EPA of a release, as required by Section 103 of CERCLA. Section 103 specifies that a person, such as a facility manager in charge of a vessel or facility, must immediately report any release of a hazardous substance that is equal to or greater than the reportable quantity (RQ) for that substance to the National Response Center (NRC). The NRC operates a 24-hour hotline to allow for immediate notification. Penalties are imposed for failure to comply with this requirement.

As illustrated in Exhibit 3.1-1, EPA added approximately 1,800 sites to CERCLIS during FY92, bringing the total inventory of potentially threatening hazardous waste sites to be evaluated under Superfund to more than 36,400 sites.

3.1.2 Preliminary Assessments

Upon being notified of a potentially threatening hazardous waste site, EPA or the state will assess the potential threat posed by the site through a PA. The PA can include either an on-site or off-site reconnaissance to observe the site and collect

**Exhibit 3.1-1
Sites Added to CERCLIS**



Source: CERCLIS; Office of Emergency and Remedial Response. 51-013-47D

information. Reconnaissance activities may include an on-site visit or survey, an off-site perimeter survey, or data collection from local authorities. EPA or the state will also review existing site-specific information for early determination of the need for further action. This information might include past state permitting activities, local population statistics, and information that identifies the site's potential effect upon the environment. This review enables the Agency or state to determine whether further study of the site is necessary, whether removal assessment/action is needed, or whether the site should be categorized as NFRAP. If the PA indicates that a potential threat is posed by the site to human health or the environment, EPA will perform an SI to do a more extensive study.

As shown in Exhibit 3.1-2, EPA and states conducted nearly 1,900 PAs in FY92, an increase of more than 45 percent over the 1,300 PAs conducted in FY91. To date, EPA and states have completed PAs at nearly 34,100 sites or nearly 95 percent of the sites in CERCLIS. The Agency has classified more

than 40 percent of sites where a PA has been conducted as NFRAP. The remaining sites have proceeded to the SI-stage for more extensive evaluation. As of the close of the fiscal year, approximately 2,000 sites identified in CERCLIS required PAs to be conducted.

3.1.3 Site Inspections

The purpose of the SI is to conduct further evaluation of the site to determine whether the site is appropriate for listing on the NPL. The SI usually includes collection and analysis of environmental and waste samples to determine

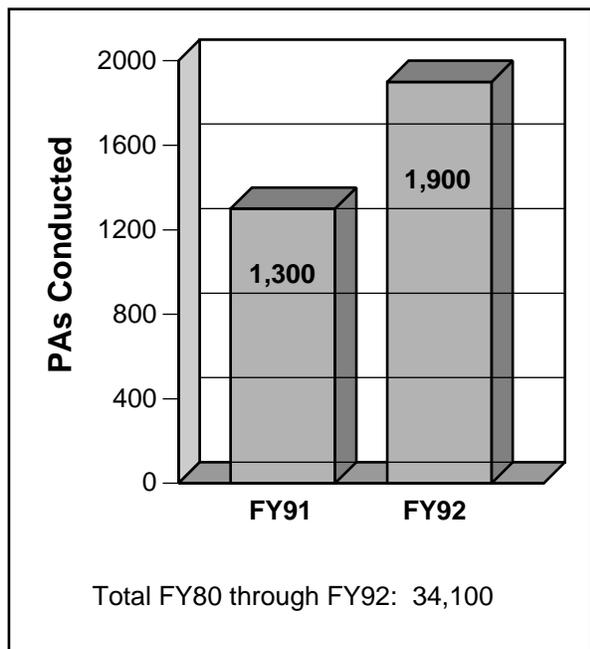
- The hazardous substances present at the site;
- The concentrations of these substances;
- Whether the substances are being released or there is potential for their release; and

- Whether the identified hazardous substances are attributable to the site.

As illustrated in Exhibit 3.1-3, the Agency completed more than 1,300 SIs during FY92 for a total of approximately 15,700 SIs conducted under the Superfund program. Most SIs conducted have resulted in NFRAP decisions and more than 1,200 have resulted in decisions to propose sites to the NPL. As of the close of the fiscal year, EPA has not yet completed SIs at approximately 3,000 sites at which data from the PA determined that an SI was necessary.

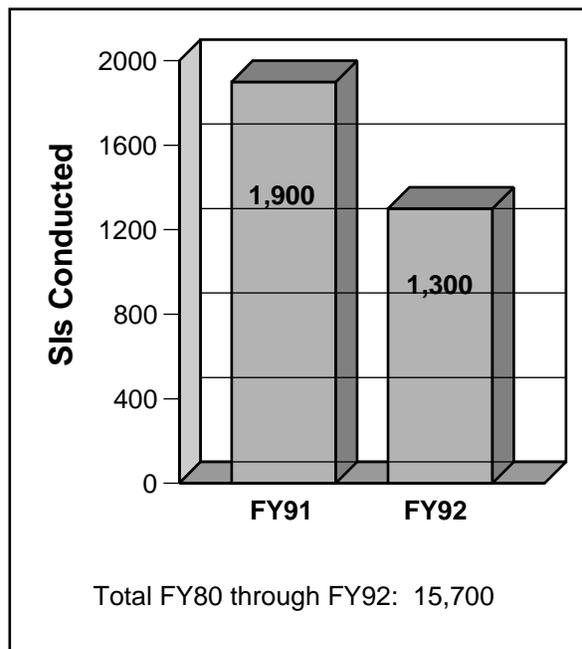
During the SI, data is gathered through increasingly focused collection efforts. At any time during the SI, EPA may make a NFRAP decision based on this data. For other sites deemed candidates for the NPL, the data will be used to calculate a score using the Hazard Ranking System (HRS). The HRS serves as a screening device to evaluate and measure

**Exhibit 3.1-2
Preliminary Assessments
Fiscal Year Comparison**



Source: CERCLIS; Office of Emergency and Remedial Response. 51-013-45J

**Exhibit 3.1-3
Site Inspections
Fiscal Year Comparison**



Source: CERCLIS; Office of Emergency and Remedial Response. 51-013-46G

the relative hazard a site poses to human health, welfare, and the environment and to determine whether placement on the NPL is warranted. The HRS evaluates four pathways for potential human exposure to contaminants from a site: ground water, surface water, soil, and air.

3.2 NATIONAL PRIORITIES LIST

The NPL is the list of sites to which EPA gives highest priority for remediation. EPA ranks the potential hazard of sites using the HRS to identify candidate NPL sites. If a site scores 28.50 or higher, the Agency proposes the site for listing on the NPL, solicits public comments for consideration, and then either announces the final listing of the site on the NPL or removes the site from consideration for listing (classified as NFRAP). A site on the NPL remains listed until all clean-up goals are attained and no further response action is appropriate, at which point, EPA will delete the site from the NPL.

3.2.1 National Priorities List Update

As of the end of FY92, there were 1,275 NPL sites, consisting of 1,183 final sites, 52 proposed sites, and 40 deleted sites. These sites included 30 sites proposed and 2 sites deleted during FY92; no additional proposed sites were listed as final. Exhibit 3.2-1 illustrates the historical number of final sites on the NPL since SARA was promulgated in 1986.

NPL Update 12, published in February 1992, was the first NPL update to distinguish non-federal, or general, Superfund sites from federal facility sites. Of the 1,275 proposed, final, and deleted NPL sites,

- 1,150 NPL sites were non-federal sites (1,067 final sites, 43 proposed sites, and 40 deleted sites); and
- 125 NPL sites were federal facility sites (116 final sites and 9 proposed sites).

Of the 30 sites that were proposed during FY92, 28 were non-federal sites and 2 were federal sites.

3.2.2 Relationship between CERCLIS and NPL Data

CERCLIS is used to track the discovery of and actions taken at all potentially threatening hazardous waste sites, including those that are listed on the NPL. Of the over 36,400 sites in CERCLIS at the end of FY92, 1,275 were either proposed to or listed on the NPL. Sites deleted from the NPL reflect an activity required to be reported. Although the sites on the NPL are a relatively small subset of the inventory in CERCLIS, they generally consist of the most complex and environmentally compelling cases. Under CERCLA, EPA can only use the Trust Fund for long-term remedial action cleanups at NPL sites; although Fund money can be used to undertake removal actions whether or not a site is on the NPL.

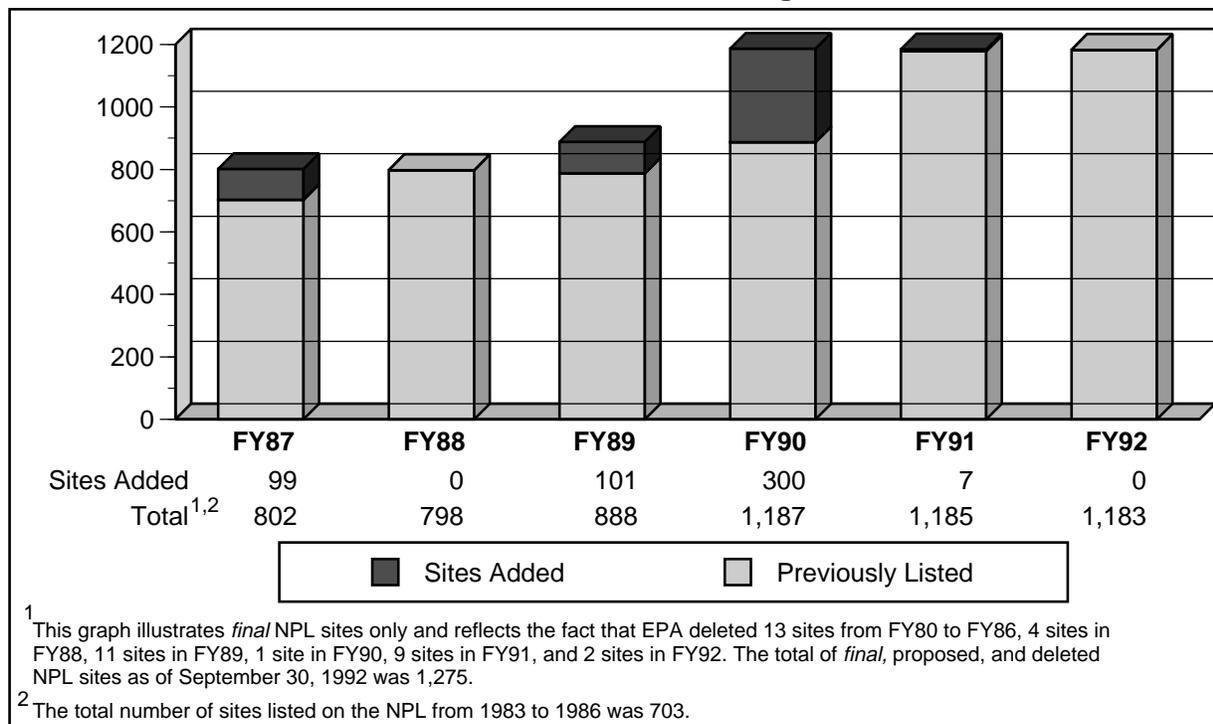
3.3 THE LEAD PROGRAM

Lead is one of the most frequently found toxic substances at Superfund sites. Also, lead is generally a major contaminant and health threat to children in urban areas that are not associated with Superfund sites. EPA has undertaken two initiatives in an effort to better assess the effects of lead contamination: developing the Integrated Exposure Uptake Biokinetic (IEUBK) Model and conducting the Three City Lead Study.

3.3.1 The Integrated Exposure Uptake Biokinetic Model

To aid Regional risk managers in establishing permanent lead clean-up levels for soil, EPA's Toxics Integration Branch (TIB) is developing risk assessment procedures and tools such as the IEUBK Model. This model predicts blood-lead levels in children who may be exposed to lead through air, soil, dust, drinking water, diet, and paint. The IEUBK Model uses site-specific data or, if no such data are available, default values that are typically based on national averages. Until a permanent lead clean-up

**Exhibit 3.2-1
Final NPL Sites for Fiscal Year 1987 Through Fiscal Year 1992**



Source: Federal Register notices through September 30, 1992.

51-013-5E

level is developed, EPA recommends an interim soil clean-up level for lead of 500 to 1,000 parts per million (ppm) for Superfund sites characterized as residential.

During FY92, EPA continued work on a site-specific IEUBK guidance manual that will assist risk assessors and managers in deciding when to use site-specific data in the IEUBK model, and in identifying the most appropriate method for collecting data. EPA continued its efforts to validate the IEUBK model by studying data from Superfund sites contaminated with lead from mining and smelting activities. Other validation studies will be conducted using urban and battery recycling sites.

During FY92, EPA's Science Advisory Board reviewed the appropriateness of using the IEUBK model to assess total lead exposure at Superfund sites. The board concluded that, although refinements in the detailed specifications of the IEUBK model are recommended, the approach used to develop the model was sound. The board stated that the model

can be applied effectively for many current needs even as it continues to undergo refinement for other applications, based upon experience gained in its use. At the end of FY92, EPA was working to complete the IEUBK model, the site-specific guidance manual on the IEUBK model, and the interim *Soil Lead Directive* to establish a permanent clean-up level for lead.

3.3.2 Three City Lead Study

During the fiscal year, EPA, with the support of the Centers for Disease Control and the Department of Agriculture, completed the Three City Lead Study, a project to determine whether a reduction of lead in residential soil and dust (interior house dust and exterior soil dust) would result in a decrease of blood-lead levels of children exposed to the contaminant. The project examined groups of children in Baltimore, Boston, and Cincinnati in carefully

chosen, non-randomly selected areas within each city. Each area was chosen on the basis of several factors, including the age of housing, the reported incidence of lead poisoning, the expected turnover rate in residents, and the potential for neighborhood involvement in the project. Biological and environmental sampling results reflect this “targeting.”

For all three cities, EPA conducted baseline sampling of blood, hand dust, soil, interior house dust, paint, and water. EPA also sampled exterior street dust in Cincinnati. Soil removal activities and post-removal sampling of lead contamination were completed in all three cities. An interim report entitled the *Three City Lead Study* was released July 26, 1991, containing descriptions of project designs, protocols for sampling and analyses, removal methods, problems encountered, and baseline data. During FY92, the Agency compiled specific study findings into individual city reports. In addition to the individual city study reports, EPA’s Office of Emergency and Remedial Response (OERR) and Office of Research and Development (ORD) were preparing an integrated, technical, peer-reviewed report that will include information from the analyses of the combined Three City Lead Study data set.

3.4 THE RADIATION PROGRAM

During the fiscal year, EPA made progress in addressing technical complexities associated with site assessments, risk assessments, and clean-up technology evaluations for sites contaminated with radionuclides. Activities included developing Superfund guidance, conducting technology demonstrations and evaluations, and providing assistance to Regions.

3.4.1 Superfund Program Guidance

EPA continued its efforts to address radiation issues by contributing to several Superfund guidance documents in FY92.

Health Effects Assessment Summary Tables

(HEAST): TIB cooperated with the Office of Radiation and Indoor Air (ORIA) to update information on radionuclides for HEAST. The updates improve risk assessment capabilities through the continued application of sound scientific principles. ORIA added more than 200 radionuclides to the March 1992, HEAST. Additionally, ORIA included and refined cancer-risk slope factors for radioactive decay chains and modified slope factors for external exposure.

- *Radiation Exposure and Risk Assessment Manual:* ORIA had under development the *Radiation Exposure and Risk Assessment Manual* that covers environmental pathway modeling and toxicity assessment.
- *Guidance for Data Useability in Risk Assessment:* ORIA completed the radiation-specific sections of *Guidance for Data Useability in Risk Assessment*.
- *Development of Clean-Up Levels:* ORIA began developing standard clean-up levels for radioactive materials in ground water and soil. ORIA also began developing guidance to establish criteria and standards for the cleanup of radioactive materials at federal facilities. The clean-up guidance will be developed to be consistent with the SACM process.
- *Guidance for Performing Site Inspections Under CERCLA:* ORIA and the Science Advisory Board continued work on HRS radiation issues. ORIA completed the radiation-specific section of *Guidance for Performing Site Inspections Under CERCLA* and a draft report addressing radiation site scoring under the revised HRS.

3.4.2 Technology Demonstration and Evaluation

Under the volume reduction and chemical extraction (VORCE) program, ORIA conducted a successful technology demonstration to reduce radioactivity in soils. Using soil from the NPL site at Montclair/Glen Ridge, New Jersey, the VORCE

pilot plant achieved a 56 percent volume reduction, with the concentration of radioactivity reduced by 73 percent in the cleaned soil fraction.

In May 1992, the Office of Solid Waste and Emergency Response (OSWER) published *Characterization Protocol for Radioactive Contaminated Soils* developed by ORIA as Directive 9380.1-10FS. An interagency task group consisting of representatives from EPA's OSWER and ORIA, the Department of Energy (DOE), and NRC began drafting five reports on environmental transport modeling for radionuclides.

3.4.3 Regional Assistance

EPA Headquarters provided the Regional offices with assistance to address NPL sites contaminated with radioactive materials. ORIA presented three DOE-funded, two-day workshops on RQs and Occupational Safety and Health Administration rules on protection of workers exposed to radioactivity. The workshops were held in Washington, DC; Augusta, Georgia; and Albuquerque, New Mexico. ORIA also conducted seminars on radioactive site remediation technologies for Remedial Project Managers (RPMs) and On-Scene Coordinators in Seattle, Washington, and Albuquerque, New Mexico.

The Agency established the ORIA National Air and Radiation Environmental Laboratory (NAREL), assisted by the ORIA Las Vegas Facility (LVF), as a Technical Support Center (TSC). The ORIA laboratories under the TSC program provided the following radioanalytical site-specific support to Regional programs:

- ORIA completed a VORCE pilot plant for the Montclair/Glen Ridge, New Jersey, site in Region 2. ORIA also completed laboratory screening for a Region 2 treatability study at a site in Maywood, New Jersey.
- In Region 3, the ORIA scanner van, operated by LVF, assisted in locating contaminated properties in Lansdowne, Pennsylvania. NAREL/TSC provided analytical support and a comparison of measurement techniques for the site.
- ORIA continued providing technical assistance

to Region 4 for oversight of the DOE remediation efforts in Paducah, Kentucky, and Oak Ridge, Tennessee. This assistance involved reviewing CERCLA documents and providing oversight of field sampling activities. Also, Region 4 Superfund staff participated in a radiation worker safety and health pilot program sponsored by ORIA.

- In Region 5, ORIA provided risk assessment support for dealing with radionuclide contamination at the Kerr-McGee/West Chicago and DOE Mound Plant sites. NAREL/TSC provided radioanalytical support for the former DOE production facility at Fernald, Ohio, and at the Industrial Excess Landfill in Union Town, Ohio.
- In Region 8, ORIA, with assistance from NAREL/TSC, provided support to justify a no-action alternative at the Denver Radium site. ORIA and NAREL also worked with the RPM on technical issues associated with the DOE Rocky Flats site.
- ORIA and LVF assisted Region 9 in developing a site sampling and analysis plan for Norton Air Force Base. This support consisted of reviewing site survey reports and providing recommendations for characterization and remediation of alleged buried radium wastes. NAREL and LVF also assisted in the remediation activities at Hunter's Point Naval Shipyard.
- In Region 10, ORIA assisted the RPM at the Idaho National Engineering Laboratory in overseeing DOE soil treatability studies. At the Hanford site, ORIA assisted the RPM in reviewing designs for a facility to vitrify radioactive waste for permanent geologic disposal. ORIA also provided technical assistance to the RPM at the Teledyne Wah Chang site.

3.5 GUIDANCE DOCUMENTS

OERR, ORIA, and ORD published several guidance documents during FY92.

- *Guidance for Data Useability in Risk Assessment*

- (Part A), April 1992: This manual provides practical guidance on the procedures for obtaining environmental analytical data that meet the minimum level of data quality required for Superfund risk assessments. Guidance is provided for both the design and evaluation of sampling and analytical activities for risk assessments within the remedial investigation.
- *Guidance for Data Useability in Risk Assessment (Part B), May 1992:* This document supplements Part A by providing information on determining the useability of analytical data for performing a baseline risk assessment at sites, including those with radionuclide contamination.
 - *Supplemental Guidance to Risk Assessment Guidance for Superfund (RAGS): Calculating the Concentration Term, May 1992:* This guidance provides additional information on general intake equations presented in *RAGS Volume 1, Human Health Evaluation Manual, Part A*. The manual discusses basic concepts concerning the concentration term, describes how to calculate the concentration term, and identifies where to find assistance.
 - *ECO Updates (intermittent):* This series of bulletins contains updates on ecological assessment of Superfund sites. The bulletins serve as a supplemental guidance to *RAGS, Volume 2, Environmental Evaluation Manual*.
 - *Understanding Superfund Risk Assessment, July 1992:* This fact sheet explains the four steps of the risk assessment process in simple, nontechnical language. It briefly describes the differences between risk assessment and risk management and explains how the results of the baseline risk assessment are used in making decisions at Superfund sites.
 - *Guidance for Performing Site Inspections Under CERCLA, September 1992:* This document provides guidance for site inspections conducted under CERCLA. The guidance discusses how to review and evaluate available information, how to plan an effective sampling strategy for collecting analytical data to evaluate a site using the HRS, and how to prepare required reports and work products.