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Improving Site Assessment: Integrating Removal and Remedial Site Evaluations

Office of Emergency and Remedial Response
Site Assessment Team

Quick Reference Guidance Series

ABSTRACT

Superfund site assessment events are designed to quickly and accurately describe the potential for human and environmental exposure to uncontrolled hazardous substances. Where appropriate, integrating assessment activities for the removal and remedial programs should realize additional savings in time and resources. This document updates the existing guidance on integrating events performed for the different Superfund programs to reflect organizational changes, incorporate new technologies, and publicize successful pilot studies that have led to improved site evaluation methods. The primary audience for this document is the site assessment community, which includes EPA On-Scene Coordinators (OSCs), Site Assessment Managers (SAMs), Remedial Project Managers (RPMs), their counterparts in States or other Federal Agencies, and site assessment contractors.

INTRODUCTION

Integrated site evaluations are a means of speeding the site evaluation process and saving resources by meeting the requirements and goals of multiple programs. It is important to distinguish integrated site evaluations from combined site assessments. Integrated site evaluations may merge features of the removal and the remedial programs to reduce duplication of effort. An example of integration is collecting data that will meet the needs of both a removal assessment and a remedial site inspection (SI), producing a single document. Combined assessments, on the other hand, consolidate specific steps within either the removal or the remedial program. For example, you might combine a remedial preliminary assessment (PA) with a remedial SI to form a PA/SI combined assessment. In summary, integrated evaluations simultaneously fulfill the requirements of different programs, whereas combined assessments are within one program.

Integration is not merely the consideration of the requirements of one program while performing evaluations under the other program. An integrated assessment meets the standards of multiple uses. Integrated assessments are not limited to the removal and remedial programs, but can be broadened to include other site assessment activities under EPA programs other than Superfund, as well as assessments performed for other Federal and State programs. This fact sheet is intended to supplement existing guidance, and to supersede the existing fact sheet for integrating removal and remedial site evaluations.

TRADITIONAL REMOVAL AND REMEDIAL SITE EVALUATIONS

Initially, the Superfund program pursued site assessment activities for the removal and remedial programs separately. This division was due partly to the separate definitions and descriptions given to these activities in the National Oil and Hazardous Substances Pollution Contingency Plan (the NCP), and the statute that created and defined Superfund.[1] The removal and remedial programs developed distinct views regarding the nature of risks and appropriate responses for their respective sites.

EPA Regions evaluated new sites to determine if the potential risks at the site warranted emergency response, or longer-term remedial action. The original site

assessment processes described for each program were similar. However, the remedial program was tailored toward scoring a site under the Hazard Ranking System (HRS), and placing appropriate sites on the National Priorities List (NPL). Unlike the removal program, remedial program policies for documentation and data quality have been subject to a process that has increased the complexity, time, and resources needed to complete remedial site assessment.

Removal Site Evaluation

Removal site assessment activities focus on demonstrating whether the conditions at the site meet the NCP criteria for a removal action. The removal assessment is designed to show if, and how, the site poses a threat to human health or the environment.

Calls and reports of pollution events come to the removal program from a variety of formal and informal sources. The removal program screens these reports for emergency response, removal or remedial action, or no further action. The removal assessment includes elements similar to both the remedial PA and SI, and is usually a one-step process. The scope of the removal assessment can vary widely depending on the characteristics of the site. Instead of following a formal checklist or format, the removal assessment documents specific information regarding imminent and substantial endangerment to public health, welfare, and/or the environment.

Further removal site assessment may be performed as part of an engineering evaluation/cost analysis (EE/CA). The EE/CA analyzes removal alternatives for sites where the removal planning period is expected to exceed six months.

Another significant difference between the programs lies in the procedures associated with data acquisition and use. Both programs produce high-quality data which is tailored to the specific intended uses of the data. However, each program may use its own distinct methods to plan, collect, and analyze samples of environmental contamination.

The removal program often considers large numbers of samples from a site, and employs field screening methods to minimize the time and costs of sampling and analysis, while still producing data of acceptable quality. Most of the resultant data has either associated quality assurance data or confirmation data from an EPA approved method (i.e., EPA 600 series, SW 846 methods, or Contract Laboratory Program (CLP) methods.) These screening methods are often developed, reviewed, approved and documented by EPA chemists on a site-by-site basis, to allow more rapid and sensitive detection of specific analytes of interest. This allows OSCs to "screen" thousands of samples in short time frames.

Remedial Site Evaluation

The original remedial site evaluation process included a series of screening events to determine the likelihood of relative risk. As a site progressed through screening events, greater time and resources were spent to characterize site conditions and to generate the HRS factors that determined whether the Agency considered the site a priority for future remedial action. If not, EPA "screened out" the site with a No Further Remedial Action Planned (NFRAP) decision. If EPA did not NFRAP the site, the end result would likely be further site characterization in a Remedial Investigation and Feasibility Study.

The remedial assessment process begins when the site is discovered and entered into the Comprehensive Environmental Response, Compensation, and Liability Information System (CERCLIS) (for further guidance on CERCLIS screening, see *Improving Site Assessment: Pre-CERCLIS Screening Assessments*).[2] The SAM then orders a PA for the site, to gather basic site information which does not require sample collection or analysis, and generally includes a cursory site visit (PA reconnaissance, or "recon."). For the purposes of this document, "PA" includes innovative approaches to remedial site assessment, such as abbreviated PAs and combined PA/SIs.

If the PA does not screen the site out of the process, the SAM generally orders an SI. The SI gathers additional evidence, including environmental samples, to determine a preliminary site HRS score. In some cases, additional information is needed, and the Agency performs an expanded site inspection (ESI) to gather the additional data needed to complete the site assessment.

While the removal program rapidly analyzes large numbers of samples using field screening methods, the remedial program generally relies on the formal and resource-intensive Contract Laboratory Program (CLP), which manages a core set of certified labs. These labs use prescribed sample handling and analysis techniques to meet the need for exhaustive documentation for remedial site investigation. The high costs associated with this approach mean that remedial investigations usually involve a limited number of samples, with meticulous documentation.

Remedial site assessment activities which do not result in a NFRAP generally culminate in an HRS package,

documenting the EPA's evaluation activities and describing the rationale for placing the site on the NPL. EPA publishes proposals to place a release on the NPL in the Federal Register, and provides an opportunity for public comment. As a result, the data quality and level of documentation have become increasingly rigorous in the remedial program. The corresponding time frame to perform remedial site assessment activities has grown in proportion to the complexity and frequency of legal challenges to the Agency's listing decisions.

INTEGRATING ASSESSMENT ACTIVITIES

With time, removal and remedial personnel came to recognize a class of sites that straddle the boundaries of their programs, sometimes requiring assessment and response work from both programs. As part of the Superfund Accelerated Cleanup Model (SACM), EPA encouraged site assessment personnel to design field activities to meet the goals and needs of the two programs, conserving time and resources. SACM was intended to increase efficiency and shorten response times. The concept was elaborated in *Assessing Sites Under SACM - Interim Guidance*.[3] Pilot tests in seven EPA regions revealed that integrated site assessments can improve and streamline the process by reducing sampling, duplication of effort, and inactive periods between steps in the process.[4]

In spite of the different objectives of removal and remedial assessments, the two programs share many goals. Both evaluate the potential for human exposure through the same media (ground water, surface water, soil and air); account for sensitive environments; and include file investigations, site visits, and (in some cases) site sampling events. These overlapping objectives offer many opportunities to consolidate site assessment activities.

One of the most interesting possibilities for integration is in sample analysis. Remedial site assessment could be greatly improved by incorporating screening methods which are routinely used by the removal program. This could result in more efficient placement of sampling points, and better confidence that the CLP samples reflect the points of greatest contamination at the site. In addition, remedial assessment would provide a more accurate picture of site conditions, if it incorporated more than just a handful of samples. New approaches to data production, such as Performance-based measurement systems, hold great promise for integrated assessment.

Site Discovery/Screening
Integrating removal and remedial site evaluations may not be appropriate at all sites. EPA regions have begun to evaluate new sites after discovery using a "one-door" screening process to determine whether the site should be addressed by purely removal or purely remedial authorities, or by a hybrid of the two. In addition, EPA has begun cooperating with State and other Federal Agencies in joint efforts and voluntary cleanup programs that may create faster and easier ways to meet the objectives and requirements of the NCP (see **Exhibit 1** attached).

Emergency Responses
This guidance is intended to provide the EPA regions and those who perform Superfund site evaluations with flexibility in meeting the goals of the removal and remedial programs. This should be accomplished in a manner that preserves the Regions' ability to respond to environmental emergencies. In the event of a "classic" emergency, the region should implement response actions immediately. Sample collection and removal actions precede administrative investigation activities in these cases.

File Search
Integrated file search activities should include all of the elements of the removal assessment file search. However, the removal assessment need only include information pertinent to documenting an imminent and substantial endangerment. Refer to the list of elements displayed in **Exhibit 2.** Thorough documentation of these elements can be critical to meeting the needs of both programs.

EXHIBIT 2
FILE SEARCH AND PERSONAL INTERVIEW

Elements Common to Both Programs

- Regulatory program file search (e.g., RCRA, water, state)
- Site access information and property ownership
- Site history, industrial processes, and management practices
- Substances used at site
- Past releases (substances, locations, impacts)
- Latitude and longitude
- Topographic maps, aerial photographs

Generally Removal Assessment Only

- Potentially responsible party (PRP) search
- Treatment technology review

Site Visits - Field Investigation/ PA Recon
Generally, site visit activities and documentation needs are similar for the removal and remedial programs. Integrated assessments can easily meet the needs of both programs, without significant increases in time and resources.

Currently, some regions occasionally perform remedial PA recons from the site perimeter. The assessment team must gain site access approval for an integrated site visit. Refer to **Exhibit 3** for additional details on common elements.

Complete the Removal Assessment/Remedial PA
Based on site conditions and the information already gathered for the file search, the Region identifies and collects any information required to complete removal and remedial assessments.[5] For example, the remedial PA requires specific information about potential or actually exposed targets, to produce a preliminary HRS score. Therefore, an integrated assessment must include this information (see **Exhibit 4**). Based on the results, the Region should either assign the site the No Further Remedial Action Planned (NFRAP) designation, or complete the integrated assessment. Remember, the information needed for the removal assessment alone may only include some of the elements shown in Exhibit 3.

EXHIBIT 3
DATA GATHERED IN THE SITE VISIT

Elements Common to both Programs

- Current human exposure identification
- Source identification (locations, types, sizes)
- Information on substances present (labels on drums and containers)
- Containment evaluation
- Evidence of releases (e.g., stained soils, stressed vegetation)
- Locations of wells (on site/immediate vicinity)
- Runoff channels or pathways (PPEs)
- Location of surface water bodies
- Identification of nearby wetlands
- Nearby land uses (e.g., residential, schools, parks)
- Distance measurements or estimates for possible targets (e.g., wells, residences, wetlands)
- Public accessibility (e.g., fences, posted signs)
- Blowing soils and air contaminants
- Photo documentation
- Site sketch

Generally Removal Assessment Only

- Eligible petroleum releases
- Fire and explosion threat
- Urgency of need for response
- Response and treatment alternatives evaluation
- Greater emphasis on specific pathways
- Sampling

Generally Remedial Assessment Only

- Perimeter survey
- Number of people within 200 feet
- Sensitive environments (e.g., endangered species habitats)
- Review all pathways

Integrated assessments are often appropriate at sites where work beyond a remedial PA will clearly be needed. They enable you to plan a single sampling event and prepare a single assessment document. You may choose to write a combined PA/SI as part of the integrated assessment document, or you may perform an abbreviated PA prior to initiating the integrated assessment (for further guidance, see *Improving Site Assessment: Abbreviated Preliminary Assessments*).[6] Determine the additional information needs based on the appropriate Agency guidance.

EXHIBIT 4
ADDITIONAL DATA NEEDS
TO COMPLETE THE REMEDIAL PA

- Population within 1 and 4 miles
- All private and municipal wells within 4 miles
- Depth to ground water
- Local or regional geology and climate
- Distance to surface water measured
- Fisheries along 15-mile TDL for surface water migration pathway
- Size of wetlands
- Previous cleanup or sampling activities
- Oversight authority
- Preliminary HRS score

Integrated Sampling Plans
When a site will require a remedial SI, producing an integrated sampling plan can further conserve time and resources. At this stage, the Remedial Project Manager (RPM) should join the OSC and the SAM in designing the sampling and analysis plan to ensure that it addresses the goals of both programs, if possible (see **Exhibit 5**). This is especially important at sites where the Region intends to initiate the Remedial Investigation prior to NPL

listing, or where an EE/CA might be needed for subsequent non-time critical removal actions.

Complete the Removal Assessment/Remedial SI
The remedial SI seeks to confirm assumptions made at the remedial PA stage, and to gather more detailed information about the site. Based on the integrated sampling plan, the Region should collect any analytical data required to satisfy the goals of both programs.[7]

FLEXIBILITY IN APPROACH

The approach taken to integration will vary depending on the site situation and regional dynamics. Successful integrated evaluations begin with a strong working relationship between the two programs. This could be achieved in several ways. Cross-training the personnel from each program to recognize the needs of the other would facilitate integration. The two programs could be merged into a single program channeling all sites. Implementation strategies must be appropriate to the structure and dynamics of each Region to ensure success.

EXHIBIT 5
DIFFERENCES IN SAMPLING EMPHASIS

Removal Assessment Emphasis

- Sampling from containers
- Physical characteristics of wastes
- Treatability and other engineering concerns
- On-site contaminated soils
- Composite and grid sampling
- Rapid turnaround on analytical services
- Screening data with definitive confirmation
- PRP-lead removal actions
- Goal of characterizing site (e.g., defining extent of contamination)
- Focus on NCP removal action criteria

Remedial Assessment Emphasis

- Attribution to the site
- Background and observed release samples
- Ground water samples
- Grab samples from residential soils
- Surface water sediment samples
- HRS targets related to sample locations
- Average of 10 - 30 samples
- Strategic sampling for HRS factors and level of contamination
- Analysis via CLP labs
- Full screening organic and inorganic analysis
- Definitive data
- Documentation of targets and receptors
- Computing HRS scores
- Standardized reports

OTHER CONSIDERATIONS

Removal actions often involve screening decisions and quick response to reduce or eliminate threats. Regions may ensure that the integrated sampling plan meets remedial program needs by completing a PA, abbreviated PA, or the PA portion of a combined PA/SI before producing the sampling and analysis plan. This should be accomplished in a manner which does not delay a removal response.

Sample analysis has traditionally been a point of departure between the removal and remedial programs. Analytical services must be designed to include documentation and reporting that support appropriate data validation. If the removal assessment requires analyses which might not support HRS uses, you should consider separate analysis using "split" samples, or find an appropriate mechanism that will satisfy HRS documentation requirements without delaying removal response.

The HRS data requirements of the remedial site assessment program must form the basis for common data elements. In instances where samples can be analyzed consistent with both programs, Regions are encouraged to integrate their actions. When this proves impracticable, other methods should be applied to dovetail the work of removal and remedial personnel and ensure appropriate programmatic collaboration. Once an integrated evaluation has been completed, the achievements should be reported in CERCLIS according to guidance for both programs.

REFERENCES

1. U.S. Environmental Protection Agency, Office of Emergency and Remedial Response, January 1992. *National Oil and Hazardous Substances Pollution Contingency Plan (NCP),* Publication 9200.2-14.

2. U.S. Environmental Protection Agency, October 1999. Quick Reference Guidance Series - *Improving Site Assessment: Pre-CERCLIS Screening Assessments.* Publication 9375.2-11FS.

3. U.S. Environmental Protection Agency, Office of Solid Waste and Emergency Response, December 1992. *Assessing Sites Under SACM - Interim Guidance*, Publication 9203.1-05I.

4. U.S. General Accounting Office, July 1997. *SUPERFUND: Integrated Site Assessments May Expedite Cleanups,* Publication GAO/RCED-97-181.

5. U.S. Environmental Protection Agency, Office of Emergency and Remedial Response, September 1991. *Guidance for Performing Preliminary Assessments Under CERCLA,* Publication 9345.0-01A.

6. U.S. Environmental Protection Agency, October 1999. Quick Reference Guidance Series - *Improving Site Assessment: Abbreviated Preliminary Assessments.* Publication 9375.2-09FS.

7. U.S. Environmental Protection Agency, Office of Emergency and Remedial Response, September 1992. *Guidance for Performing Site Inspections Under CERCLA,* Directive 9345.1-05.

FOR MORE INFORMATION

For more information on Integrated Site Assessments, please contact Daniel Thornton at EPA Headquarters, phone (703) 603-8811, or email thornton.dan@epa.gov.

Exhibit 1
Site Assessment
Flow Chart