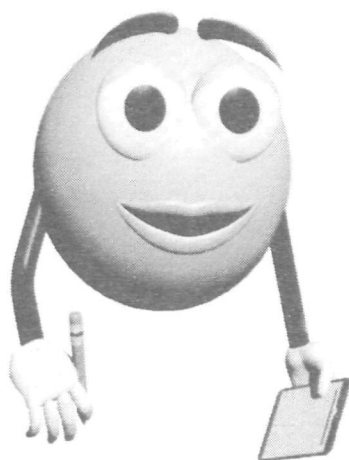


# Supplemental Guide to Video on Superfund Site Assessment Screening: A National Priority





# Supplemental Guide to Video on Superfund Site Assessment Screening: A National Priority



Hazardous Site Evaluation Division  
Office of Emergency and Remedial Response  
Office of Solid Waste and Emergency Response  
U.S. Environmental Protection Agency  
Washington, D.C. 20460

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# Chapter I: Introduction

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EPA's Superfund program uses a systematic site assessment screening process to determine which hazardous waste sites should be considered a national priority. The site assessment screening process is an objective, methodical process that follows established procedures and uses a uniform set of decision-making criteria.

This video is intended for state, EPA, or contractor personnel who perform site assessment screening for Superfund. The level of detail of the video is directed at staff who are new to the Superfund program. The video gives an overview of the Superfund site assessment screening process and provides those performing the tasks an overall understanding of their work. It does not provide specific instruction on the details of any tasks (e.g., collecting samples, scoring a site).

The video also may be informative for state staff and EPA regional and headquarters staff who oversee or are peripherally involved with site assessment work.

The importance of the individual investigator and a thorough investigation are key lessons in the video and this guide. Other components of the video and this guide will help you understand:

- Objectives of the Superfund site assessment screening process;
- Resources available to help you do your job;
- Steps which lead to a thorough site assessment; and
- How your job fits into the Superfund program.

The site assessment screening process and how it fits into the Superfund program are introduced in general terms in the first part of the video. The focus is on the

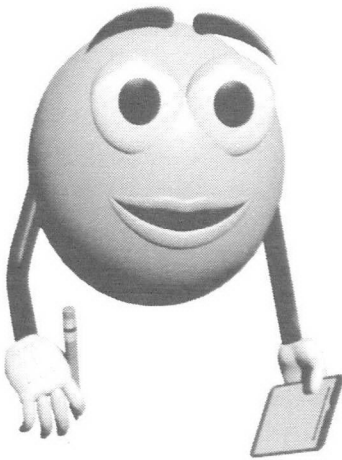
current site assessment screening process, which includes the Preliminary Assessment (PA), Site Inspection (SI), and Hazard Ranking System (HRS) scoring. In April 1992, the Office of Solid Waste and Emergency Response, Office of Emergency and Remedial Response, presented the Superfund Accelerated Cleanup Model (SACM), a new approach for streamlining and accelerating the Superfund program. The overall goal of SACM is to accelerate cleanups and increase efficiency in the Superfund process within the framework of the existing statutory and regulatory structure. This must be accomplished while ensuring that cleanups continue to be protective and allow for appropriate public involvement. SACM is discussed in this guide.

The second part of the video presents a hypothetical site – Roberts Solvent Reclamation – as an example to which the site assessment screening process is applied. You will go through the process with the investigator, as he illustrates what resources are available, how to obtain data, and how the process is dependent on each step. You will hear about the importance of this work from your colleagues in the Superfund site assessment program, as well as concerned citizens.

Chapter II of this guide contains a "road map" of the video with additional information on some of the topics presented. Appendix A contains scoresheets which provide additional scoring details of Roberts Solvent Reclamation site. Appendix B lists reference documents; Appendix C provides a list of contacts; and Appendix D includes a list of other site assessment tools. You can refer to these sections of the guide during or after viewing the video for more information or clarification.

Now, start the video.





## Chapter II: Reference Information

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### A. Overview of Site Assessment Screening Process

This chapter of the guide provides a "road map" of the video, reviewing the information presented. It also provides background information on topics that were briefly discussed in the video.

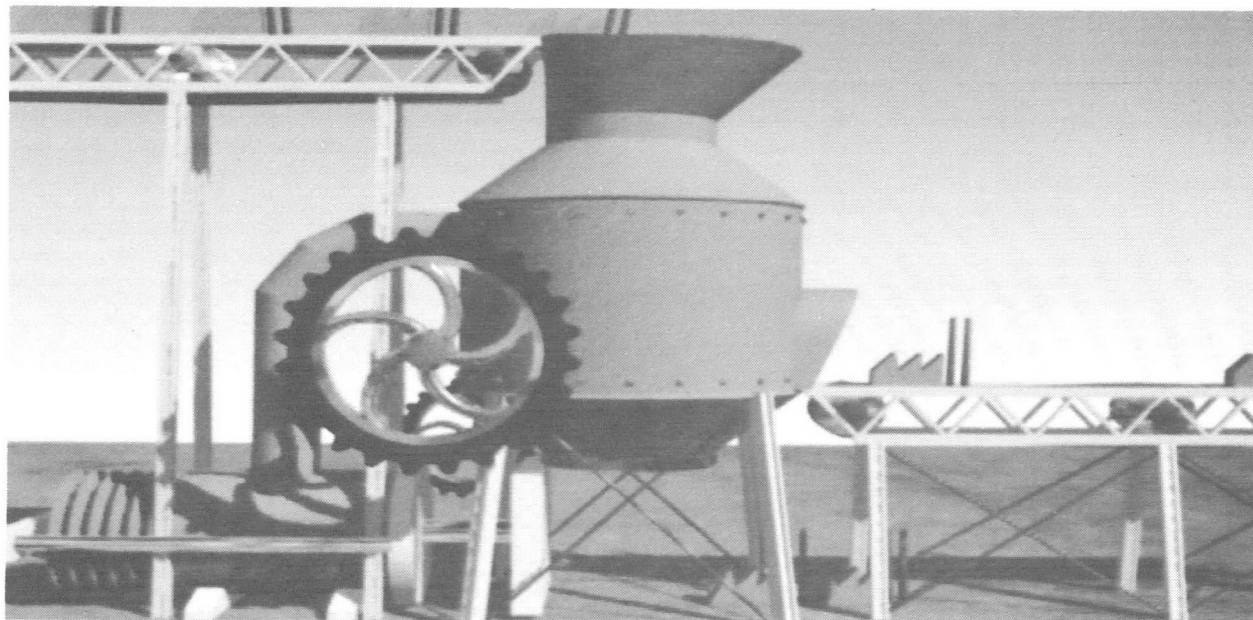
Section A presents an overview of the site assessment screening process, first introducing all components of site assessment screening. The three components that are the focus of the video – the Preliminary Assessment (PA), the Site Inspection (SI), and Hazard Ranking System (HRS) scoring – are briefly described. The rulemaking process for proposing a site for inclusion on the National Priorities List (NPL) and a Superfund model (SACM) proposed in April 1992 are also introduced.

Section B covers more details of the process using the hypothetical site presented in the video, Roberts Solvent Reclamation.

The site assessment screening process determines which hazardous waste sites should be considered a national priority. It is an objective, systematic process that follows established criteria. Site assessment screening also serves as an early warning system to identify sites needing immediate attention.

The people who perform site assessment screening and their work together as a team are two key elements in the success of the process. These elements are emphasized throughout the video and this guide.

Site assessment is a screening process, a "sifter" used to ensure that the limited Federal resources are directed toward the worst sites (i.e., sites that pose the greatest threat to human health and the environment).





## A.1. Components of the Superfund Site Assessment Screening Process

Each component of the Superfund site assessment screening process is described briefly, and additional information is provided on the three components that are of primary interest to the site investigator: the PA, the SI, and HRS scoring.

**Site Discovery** The Superfund site assessment screening process begins when sites are "discovered" and reported to EPA by state and local agencies, industries, citizens, and anonymous complaints.

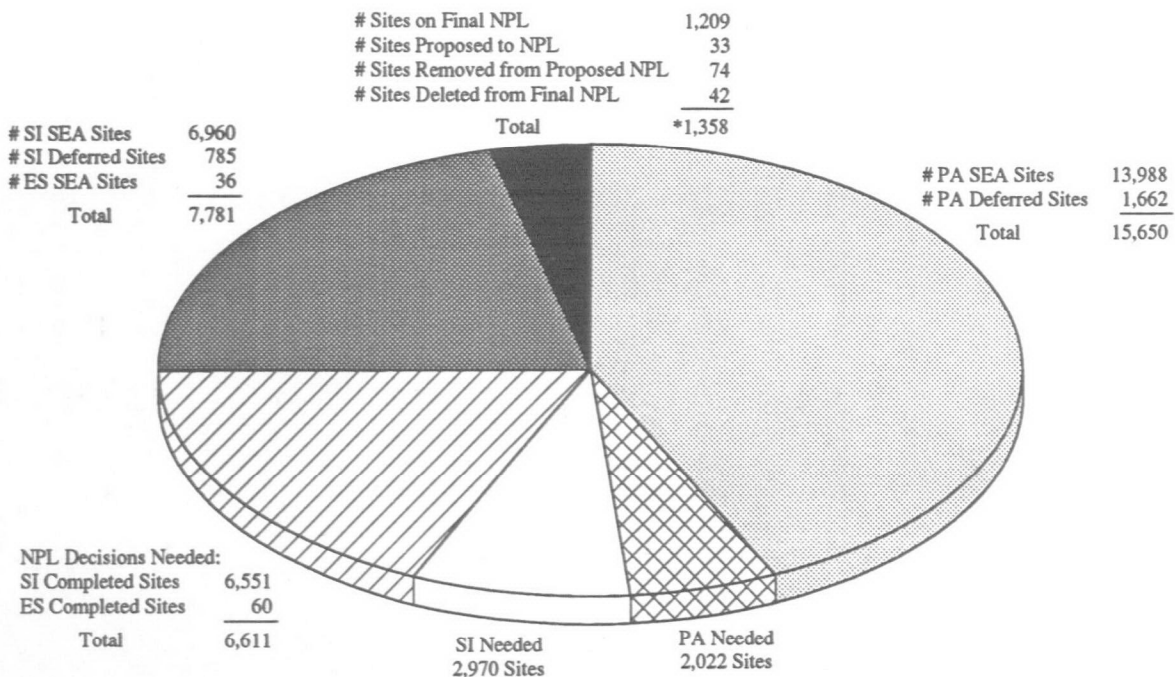
**CERCLIS Listing** Once "discovered," every site is entered into the comprehensive inventory, CERCLIS, which stands for the CERCLA Information System. CERCLA, the Comprehensive Environmental Response, Compensation, and Liability Act, is the legislation that created the Superfund program.

When a site is entered into CERCLIS, CERCLA requires that the site assessment screening process begins within one year.

**Preliminary Assessment** The first evaluation of a site is termed Preliminary Assessment. A PA is a limited-scope investigation to collect readily available information and conduct a site reconnaissance, or visit. The PA distinguishes sites that pose little or no potential threat to human health and the environment from sites that warrant further investigation. More details of the PA are described in Section A.2.

**Site Inspection** The second, more detailed evaluation of a site, the Site Inspection, follows if the PA results suggest that the site potentially poses sufficient threat to human health and the environment. This investigation includes collecting samples of waste and potentially contaminated environmental media. The SI is described in more detail in Section A.3.

### Status of CERCLIS Site Assessment Inventory Through 09/30/92 - All Regions Federal and Non-Federal Sites



Source: CERCLIS (10/23/92)

\* Includes NPL information in CERCLIS as of 10/23/92

t33005-1

**HRS Scoring** The Hazard Ranking System is a scoring system that provides a uniform, national method to evaluate all sites. The HRS also defines the data needs of the PA and SI. HRS scoring is based on data gathered during the PA and SI. HRS scoring is described in Section A.4.

**NPL Listing** Sites that pose the greatest threat to human health and the environment are considered the highest priority sites and are proposed for the National Priorities List. Sites on the NPL are eligible for Federally financed cleanup. However, cleanup costs at most sites are paid by the parties responsible for the contamination at the site. The rulemaking process to include a site on the NPL is described in Section A.5.

**Emergency Response Actions** Some sites require early action (i.e., emergency response) to reduce risk. Emergency response actions include spill responses, removal of unstable waste, and provision of alternate water supplies. An important part of site assessment is identifying sites that may require such actions. These sites will receive immediate attention from the Emergency Response Team in your region. The focus of this video and guide is on sites that require long-term response, or remedial action.

**Site Evaluation Accomplished** An important decision at the PA and SI is whether or not the site appears to pose a sufficient threat to human health or the environment to warrant further action under CERCLA. Sites that do appear to warrant further action under CERCLA are referred to the next step in the process. At sites that do not appear to warrant further action, EPA informs states and other regulatory authorities that the Site Evaluation is Accomplished (SEA) and no further action will be taken under CERCLA. SEA designation does not indicate that the site poses no threat. Further site evaluations and remedial actions may be required under applicable Federal and state environmental statutes (e.g., the Resource Conservation and Recovery Act, the National Environmental Policy Act, the Clean Water Act, and the Safe Drinking Water Act). The term previously used for SEA was No Further Remedial Action Planned (NFRAP).

As reflected in the structure of the HRS, there are three basic questions to be addressed during the site assessment process:

- Have hazardous substances been deposited at the site? If so, what and how much?
- Have hazardous substances migrated from the site? If not, are they likely to?
- Who and what are likely to be affected?

## A.2. Preliminary Assessment

The PA is a short investigation during which readily available information is collected. This information is used to develop hypotheses or questions regarding the nature of the threat posed by the site. If a state has investigated a site, the PA may begin with a great deal of information. However, sometimes very little information is available about the site when beginning a PA (e.g., nothing more than the reported address of the site may be known). Analytical data on hazardous substance releases and people or environments exposed to actual contamination are usually not available at the PA.

The PA, which takes an average of 120 hours to complete, includes a comprehensive inventory of all people and sensitive environments potentially affected by the site. During the PA the investigative team also determines how much waste is present at the site. The investigator applies professional judgment to form hypotheses regarding whether hazardous substances have been released and whether people or environments have been exposed to these substances.

Almost all PAs require an on- or off-site reconnaissance (or "recon"). Three objectives of the recon are to:

- Observe site conditions;
- Collect additional information to confirm file data on the site (such as population and environmental data) and to document the PA evaluation; and
- Evaluate the need for removal or emergency action.

When visiting a site or speaking with local residents, it is important to consider community relations protocols. Community representatives should be contacted in advance of the site visit. Superfund community relations coordinators can help identify appropriate representatives. Only designated team members should participate in discussions with local residents, remaining as factual as possible and avoiding expressing opinions or raising expectations for future action. Team members should refer questions to the Regional Site Assessment Manager. For guidance on community relations during site assessment, see *Community Relations in Superfund: A Handbook* and two fact sheets (see Appendix B).

Typical reconnaissance activities include:

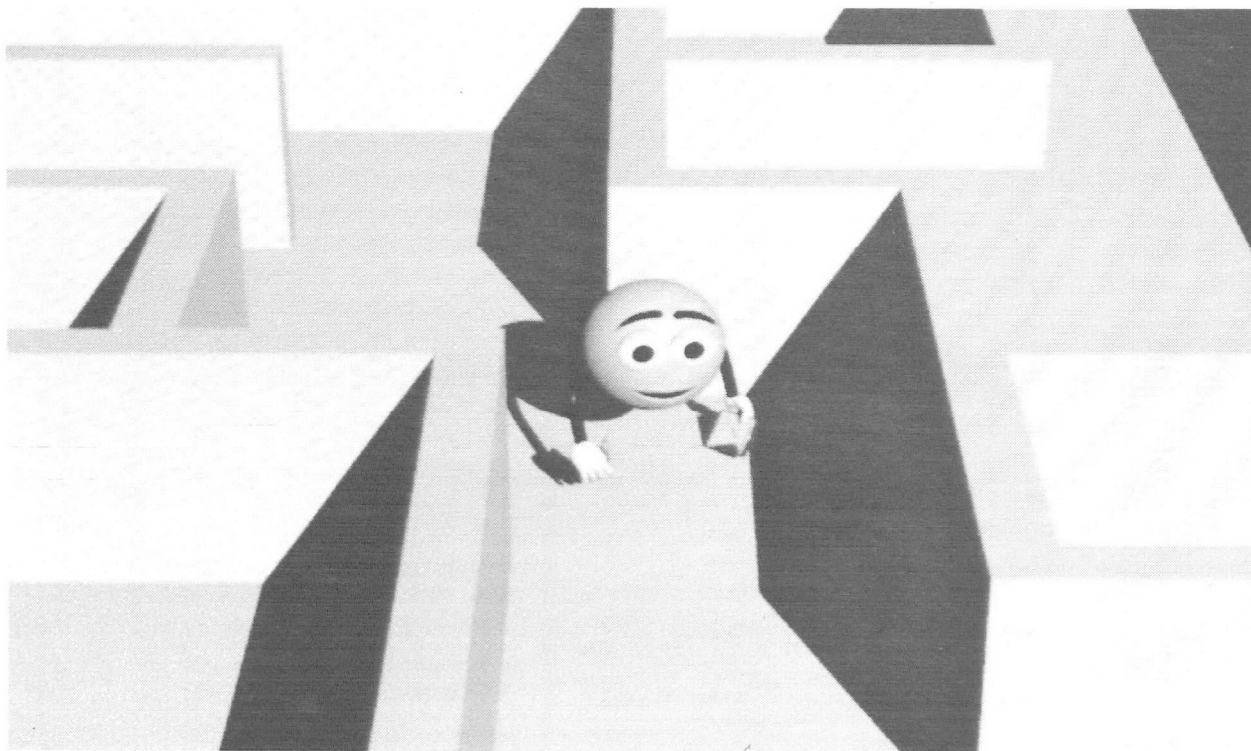
- Conducting a perimeter survey;
- Preparing a site sketch;
- Evaluating source types, sizes, and containment;

- Assessing waste disposal practices;
- Estimating waste quantity;
- Assessing areas of stained soil and potentially affected vegetation;
- Determining drainage paths;
- Identifying residences, wells, schools, day care facilities, resources, and sensitive environments on and around the site;
- Assessing nearby land uses;
- Interviewing local authorities; and
- Identifying emergency response conditions.

Once it has been determined that there were hazardous substances somewhere on site, the investigators should determine what they were and how much was deposited. The investigators must also decide whether a release is suspected and whether any people or environments are suspected of being exposed to hazardous substances. The PA scoresheets include criteria lists that guide the investigators in using professional judgment to answer these questions.

Using the information collected during the PA, a PA score is calculated. The score is used to determine if the site should continue to the SI or if site evaluation is accomplished under CERCLA, in which case the site is referred to the state for possible further action. Historically, about 60 percent of the sites investigated have continued from the PA to the SI; in other words, approximately 40 percent are designated as SEA after the PA.

Enforcement efforts during the PA begin with identifying potentially responsible parties (PRPs), those individuals or companies that may be responsible for the contamination at the site. Site owners and waste generators or transporters are PRPs that the Superfund program will investigate to recover cleanup costs.



You may feel anxious about your ability to conduct site assessment screening or to find information necessary for a good PA, especially if you are new on the job. There are many excellent resources available to you to help you with your search. These are listed in the appendices of this guide and detailed in Appendix B of the PA guidance.

### **A.3. Site Inspection**

The SI is a limited, purposely biased investigation of contaminants at and near the site. The purpose of the SI is to identify the specific hazardous substances at the site, determine whether these substances have migrated into the environment, and determine whether contamination has reached people or sensitive environments. A critical part of the SI is testing the hypotheses developed at the PA regarding suspected releases and suspected contamination.

The SI generally involves a greater level of effort and considerably more planning than the PA. Analytical

(sampling) data required for HRS scoring are obtained during the SI. The SI also is more tailored to site conditions than the PA; types of releases and types of threats that must be investigated differ widely among sites and may require different sampling strategies.

To gather information for HRS scoring and test the hypotheses formed at the PA, SI data collection activities include collecting a limited number of samples of soil, water, air, and the waste at the site. Because sampling is limited, it is important that each sample be carefully planned and purposeful – the site investigators must use the limited number of samples wisely, i.e., "sample smart."

The SI data collection activities also include investigation of records, land use, and geology. Information is gathered on certain features of the site (e.g., aquifers, fisheries, and previous uses of the site) that either was not available at the PA or could not be obtained within the scope of the PA.

Just as the SI relies on the PA information, the PA and SI results may be the basis for later characterization and risk assessment if the site goes on to become an NPL site. The analytical data collected during the SI and the other data collected during the PA and SI form the basis of the HRS score. Once the data collection is complete, HRS scoring is performed.

## A.4. HRS Scoring

The HRS is a regulation and a scoring system originally adopted in 1982 to evaluate the relative priority of hazardous substance release sites. The scoring system allows EPA to determine whether a site should be placed on the NPL. The scoring system is a comprehensive tool to provide objective, uniform criteria for evaluating sites.

CERCLA section 105(c)(1) states " ... to the maximum extent feasible, that the Hazard Ranking System accurately assess the relative degree of risk to human health and the environment posed by sites and facilities subject to review."

The HRS was revised in 1990 in response to the Superfund Amendments and Reauthorization Act of 1986 (SARA). The revised HRS retains the same basic structure as the original, while incorporating SARA requirements, as well as improvements identified by EPA and the public. The revisions made the HRS more comprehensive and more accurate.

The HRS evaluates a site by examining three "factor categories," which are Likelihood of Release (LR), Waste Characteristics (WC), and Targets (T). (Targets are defined as physical human or environmental resources that are threatened, or potentially threatened, by a release, or potential release, of hazardous substances from the site.) A value is calculated for each factor category based on many individual variables, called "factors." Some factors are assigned values from charts listed in the HRS (see Appendix B). For example, based on observations and documentation of the physical characteristics of a source, a containment factor value is assigned from HRS Table 3-2, which is used in the calculation of Likelihood of Release. The

factor categories are evaluated for each of four environmental media or pathways – ground water, surface water, soil exposure, and air.

For the ground water, air, and soil pathways, potentially contaminated targets are evaluated according to distance categories, which are concentric around sources. The values assigned to targets are multiplied by a weighting factor, which declines as distance increases to reflect expected lower concentrations. Potentially contaminated targets for the surface water pathway calculation are similarly evaluated according to dilution categories related to the flow and depth characteristics of the surface water body. This is referred to as distance- and dilution-weighting of targets.

For each pathway, a score ( $S_x$ , with x representing the pathway) is calculated using the equation:  $LR \times WC \times T / 82,500$ . The constant (82,500) is used to calibrate each pathway score, so that maximum values for likelihood of release and waste characteristics, multiplied by a value of 150 for targets, result in the maximum pathway score of 100.

Pathway score:

$$S_x = \frac{LR \times WC \times T}{82,500}$$

The four pathway scores are then combined into one equation which generates the site score.

Site score:

$$\sqrt{\frac{(S_{GW})^2 + (S_{SW})^2 + (S_S)^2 + (S_A)^2}{4}}$$

The site score equation uses a root mean square algorithm to emphasize higher scoring pathways. A site will score high even if only one of the four pathways scores high.

Any site scoring 28.5 or greater is eligible for inclusion on the NPL. For the original HRS, EPA chose a cutoff of 28.5 because it yielded an initial NPL of at least 400 sites, as suggested by CERCLA; 28.5 does not represent a threshold of unacceptable risk. For the revised HRS, EPA decided not to change the cutoff score because analysis did not point to a single number as the appropriate cutoff. EPA believes that the range of scores between 25 and 30 represents a true breakpoint in the distribution of site scores and that the sites scoring above the range of 25 to 30 are clearly the types of sites that should be captured with a screening tool. Therefore, if a score is close to 28.5, the investigators must be certain to carefully document the score.

EPA has developed computer software entitled PREscore to assist site assessment investigators by automating HRS site scoring. PREscore performs HRS calculations from raw data entered by the scorer, using HRS-related hazardous substance information. PREscore allows site investigators to easily test different scoring scenarios and can be used to generate HRS documentation and other decisional records. A preliminary HRS score calculated during the SI may be modified as data is gathered and refined during the HRS package preparation.

The HRS is a thread through the entire site assessment screening process – the data collection objectives of the PA and the SI are determined by the HRS data input requirements. Information from each step is carried to the next. It is important to document all data and scoring decisions accurately and completely. At many sites, different teams of site investigators conduct the different steps of the assessment; that is one team may perform the PA and another the SI. At sites that go on to be proposed for the NPL, PA and SI data must be legally defensible.

## A.5. National Priorities List

An HRS package is prepared for every site that is proposed for the NPL. It contains the legal and technical information compiled during the site assessment screening process and is used to propose sites for the NPL. Historically, only about 8 percent of the sites listed in CERCLIS have been placed on the NPL. When a site goes on the NPL, EPA investigates further to determine a long-term cleanup strategy for the site.

To include a site on the NPL, EPA follows a rulemaking process.

- EPA proposes sites for the NPL by publishing a list of sites in the *Federal Register*. This is referred to as a proposed rule.
- HRS packages for proposed sites contain data from the PA, SI, and HRS scoring and are available for viewing during a period of public comment, which is generally 8 to 10 weeks.
- The public (including PRPs) can submit comments on any site in the proposed rule; the HRS score presented in the NPL proposed rulemaking may be modified in response to public comments.
- After considering all comments, EPA adds sites to the NPL if they meet program requirements and any applicable listing policies. EPA publishes the list of sites as a final rule in the *Federal Register*.

## A.6. The Superfund Accelerated Cleanup Model

In April 1992, the Office of Solid Waste and Emergency Response, Office of Emergency and Remedial Response proposed SACM, a new approach for streamlining and accelerating the Superfund program. The model seeks to accomplish four objectives:

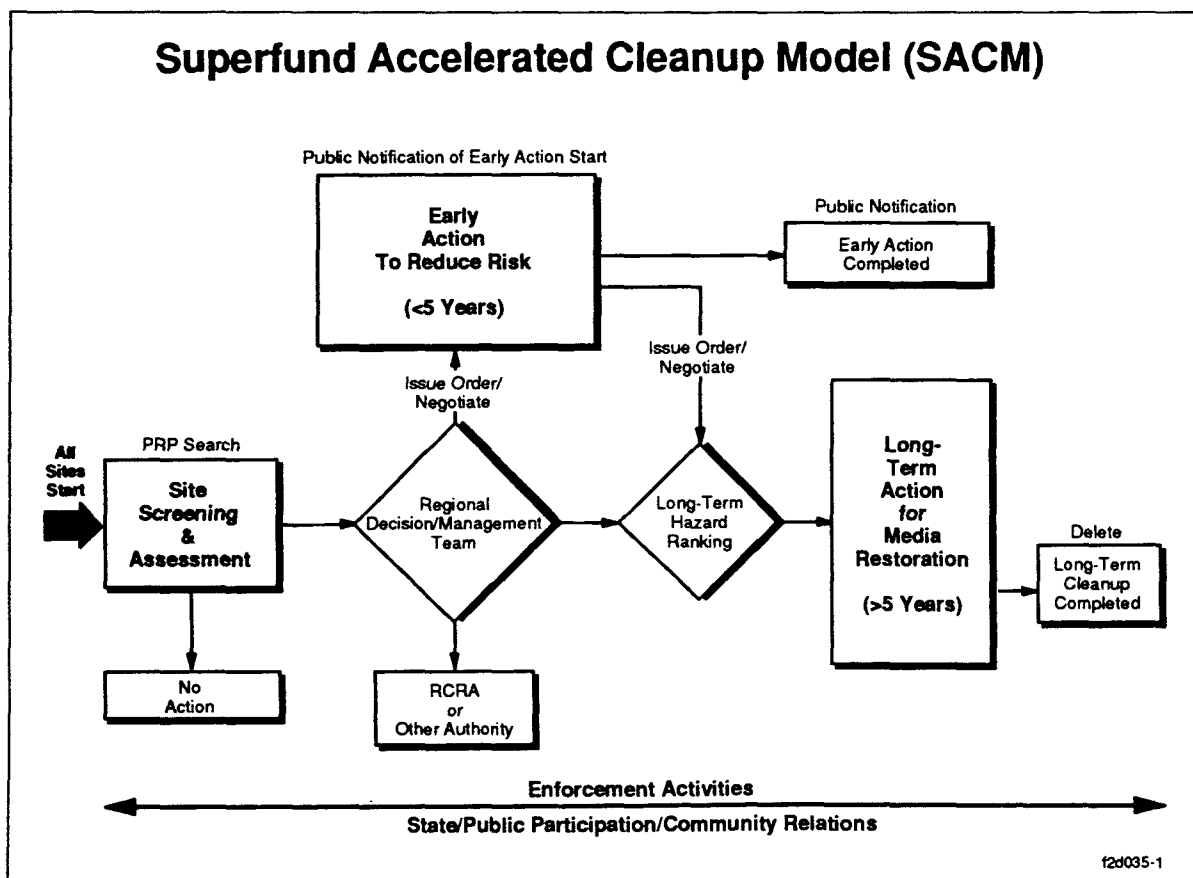


- Establish a continuous process for the assessment of site-specific conditions and the need for action;
- Create cross-program Regional Decision/Management Teams responsible for initiating appropriate actions as information is developed about a site;
- Achieve prompt risk reduction through early actions; and
- Ensure the appropriate cleanup of long-term environmental problems.

The process integrates traditional site assessment functions to support both removal and remedial assessments. This ensures that data collected in one phase of site assessment supports other assessment, enforcement, and response activities. After the initial screening and risk assessment, the

Regional Decision team can initiate an early response action to eliminate or reduce human health or environmental threats where quick response is necessary. These actions can include cleanup activities generally taking no more than three or, at the most, five years. For additional information and guidance on the SACM initiative, please refer to the five short sheets, dated December 1992. These cover key program management issues, early action and long-term action, enforcement, assessing sites, and Regional Decision Teams.

The Regional Decision Team will also determine if and when long-term remediation (e.g., ground water restoration) is appropriate. Sites will then be placed on the Long-Term Remediation List and be cleaned up over many years. It will be clear to the public that sites placed on this list would require many years, if not decades, to clean up, but would pose no immediate threat to existing populations.



## B. Roberts Solvent Reclamation Site – An Applied Example

A hypothetical site was created for this video in order to walk through the process and provide details about where information is obtained and, generally, how scores are calculated. Elements of the site scoring procedures are outlined in data sheets contained in Appendix A.

### B.1. Preliminary Assessment at Roberts Solvent Reclamation

PA activities include collecting information, a site reconnaissance, scoring, and reporting.

#### Data Collection

Most of the PA investigation is usually spent collecting readily available data. When the Roberts Solvent Reclamation site was referred to Superfund, all the investigator had was a file containing a location and a brief description of drums at the site.

The first thing the investigator did was to locate the site on a topographic map. The map indicated that a creek near the site flowed into a wetland and a major river.

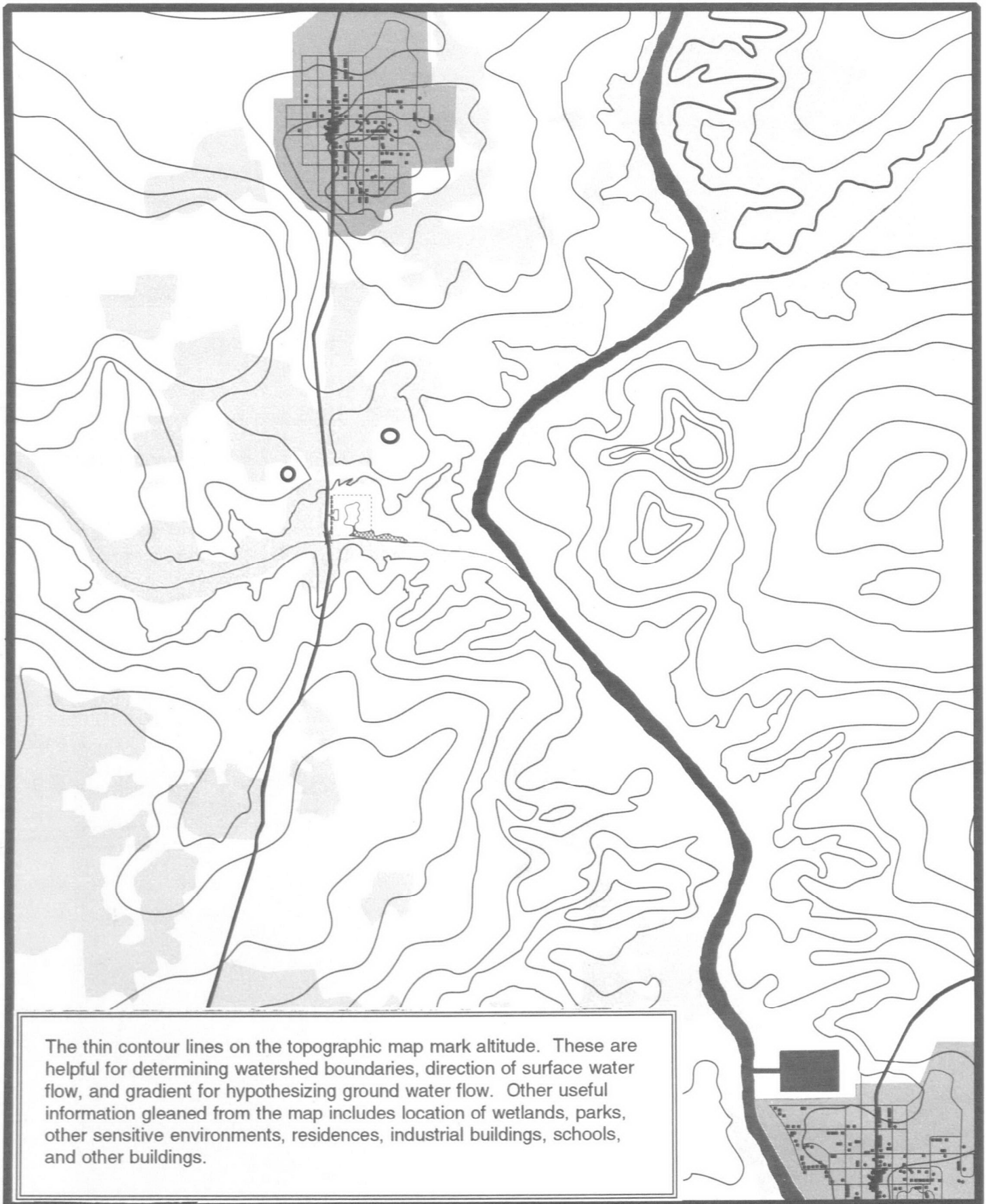
The investigator received permission from EPA to visit the site and planned a site recon. While in the office, he gathered more information using the Site Assessment Information Directory (SAID – see Appendix D). The investigator contacted the local water authority and the tax assessor.

From the local water authority, he found that there is a drinking water intake on the river below the confluence of the creek. He found out that the tax assessor would provide plat maps which could define the property boundaries of Roberts Reclamation. The tax office also had information on the duration of operations at the site.

PA site assessors should consult the PA Guidance (see Appendix B) when structuring their data search. They should refer to the checklist of PA information needs that must be addressed during the PA process.



## Topographic Map for Roberts Solvent Reclamation



## Site Reconnaissance

During the site recon, the investigative team viewed the site from the periphery. They noted drums, stained soil, a drainage ditch, fisheries, and homes nearby. While in the area, the investigators visited the tax assessor and obtained the property boundaries and names of owners of the nearby homes. A visit to the water authority confirmed the intake on the river as the sole source of drinking water for Springfield, a town of 5,000. The investigators also found out that Westwood gets its water from two municipal wells northwest of the site.

The investigators also called one of the neighbors, who had been a foreman at Roberts Solvent Reclamation. Based on information the foreman had on the production of the company, the investigators could better estimate the number and contents of the drums. The foreman confirmed that private wells are the neighborhood's source of drinking water.

## Scoring and Reporting

At this site, there was a moderate amount of waste present, a strong likelihood that it is being released, and a strong likelihood that the creek and wetland are contaminated – therefore, the site received a PA score of 53.49 and moved on to the Site Inspection. The scoring procedure for the PA is derived from the HRS scoring algorithms, which are explained in greater detail in Section B.3. The PA scoring for this site is outlined in Appendix A.

Hypotheses were formed at the PA regarding the nature of the threat posed by the site. At Roberts Solvent Reclamation, the investigators hypothesized that hazardous substances were present. They hypothesized that the drinking water intake on the river was not contaminated because of its distance down river from the site, but that the creek and the fish in the wetland were contaminated. They did not suspect a release to ground water, so no contamination of nearby drinking water wells was suspected.

Accurate data collection and thorough reporting are important at the PA because a different person will most likely investigate the site in the next site

assessment steps and will rely on the information gathered at the PA.

## B.2. Site Inspection at Roberts Solvent Reclamation Site

Sampling at Roberts Solvent Reclamation included testing hypotheses made during the PA and determining background levels of contaminants in soils, sediments, and ground water. The investigative team sampled the two sources of waste at the site (the drum area and the stained soil) in order to identify hazardous substances present at the site. They sampled nearby environments (the wetland and Little Creek) to determine whether they were contaminated. The investigators also collected samples at the nearby municipal and private wells, and the town of Springfield's drinking water intake, in order to ensure that drinking water supplies were not contaminated.

With sampling results, the investigators documented the presence of PCBs, chlorinated solvents, and VOCs, and delineated an area of surficial soil contamination. PCB contamination was documented in the wetland and Little Creek and therefore, it can be assumed that the fishery is also contaminated. The absence of contamination in drinking water supplies was also documented.

At the SI, data collection activities often include resource intensive investigations that could not be performed within the scope of the PA. Record searches at Roberts Solvent Reclamation refined the estimate of drums and indicated the presence of PCB waste.

It is important to note that the investigators followed EPA standard health and safety procedures, which vary according to the threats at a site. At Roberts Solvent Reclamation, health and safety procedures included wearing respirators and protective clothing during sampling, and working with a buddy.

After collecting the SI data, the investigator scored the site using the HRS scoring procedures.

### B.3. HRS Scoring for Roberts Solvent Reclamation

For details on scoring Roberts Solvent Reclamation, refer to Appendix A.

In scoring the ground water pathway for Roberts Solvent Reclamation, the likelihood of release received a value of 240 because the aquifer used for drinking water was moderately deep and the ground beneath the site was not very permeable to water. Because of the moderate volume of waste present and the moderate toxicity of chlorinated solvents, waste characteristics in the ground water pathway received a value of 10. Because the nearby private wells and the municipal wells serving Westwood were found not to be contaminated, the targets value of 194 reflects the dilution that contaminated ground water would experience as it moved toward the wells. Putting these numbers in the pathway equation, the ground water pathway received a score of 5.64.

Ground water pathway score:

$$S_{GW} = \frac{240 \times 10 \times 194}{82,500} = 5.64$$

Because sediments in the wetland were contaminated with PCBs, which pose a threat to both the human food chain and environmental targets, the surface water pathway received a maximum pathway score of 100. At Roberts Solvent Reclamation, the soil exposure and air pathways pose very little threat and received low pathway scores. The soil exposure pathway score of zero and the air pathway score of 0.71 reflect no on-site population and a small nearby population. To summarize, the ground water pathway scored 5.64, the surface water pathway scored 100, the soil exposure pathway scored zero, and the air pathway scored 0.71.

Roberts Solvent Reclamation Site Score:

$$\sqrt{\frac{(5.64)^2 + (100)^2 + (0)^2 + (0.71)^2}{4}} = 50.08$$

Roberts Solvent Reclamation scored 50.08, which means that it is eligible for the NPL. If this were a real site, an HRS package containing all technical documentation would be prepared to support the proposal of including this site on the NPL.

### B.4. Summary and Wrap Up

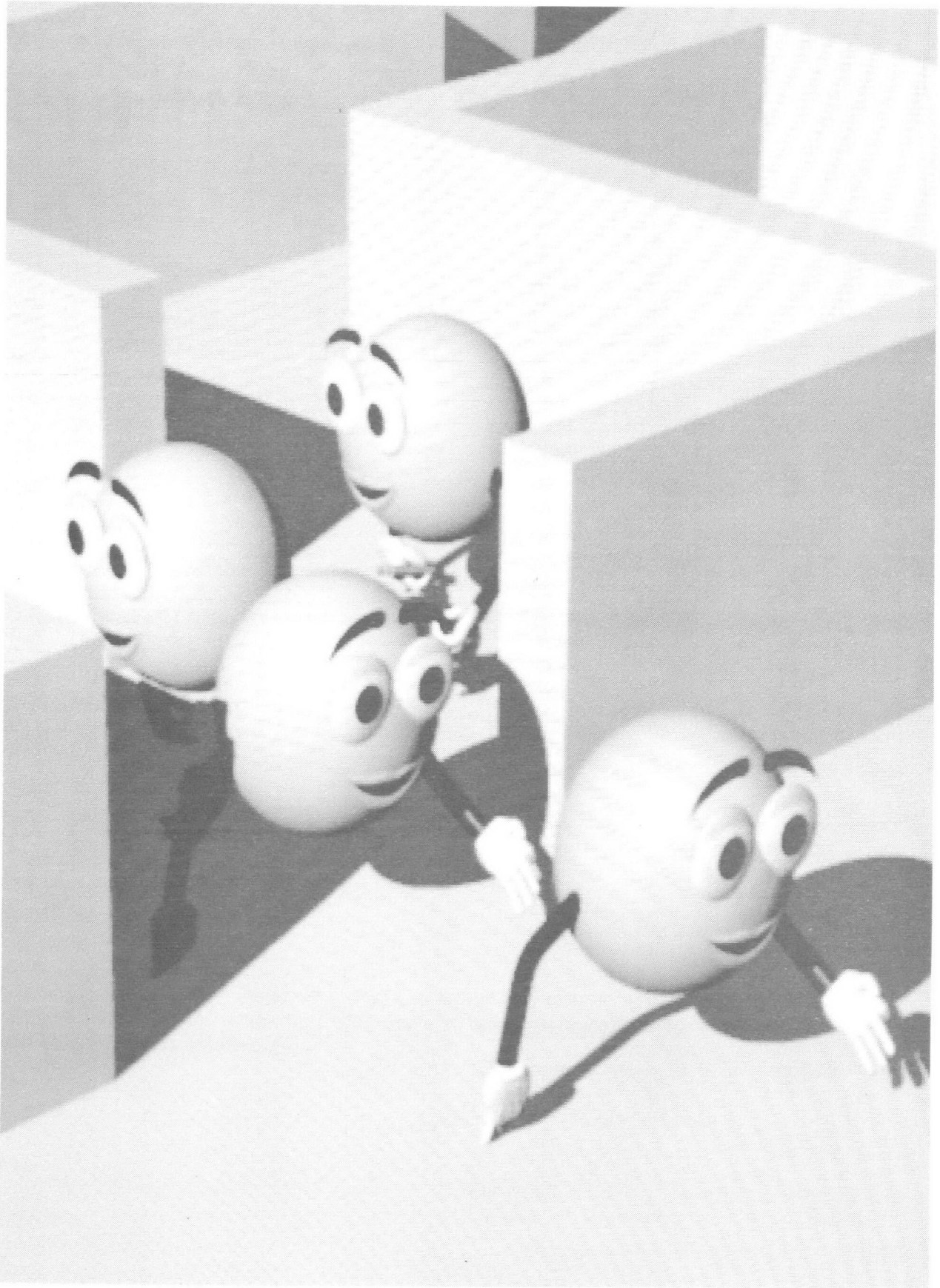
Three important points:

- Your involvement in each step is important in achieving the overall goals of the Superfund program – to direct limited Federal funds to the sites that pose the greatest threat to human health and the environment.
- Only a small percentage of sites make it to the NPL, but all assessments are important. Site assessment screening is not a contest to get a site on the NPL; a SEA determination is just as important as listing a site.
- You will need to rely on your professional judgment, and this will be easier as you gain more experience. Until then, rely on your colleagues, available guidance, and other resources.

There are many resources available to you including people, documents, and computer programs. Refer to the appendices in this guide for a list of these resources.

Remember, if you get lost, rely on your site assessment teammates.









# Appendix A: Scoresheets for Roberts Reclamation Site

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## 1. PA Scoring

- a. General Information
- b. Source Evaluation
- c. Ground Water Pathway
- d. Surface Water Pathway
- e. Soil Exposure Pathway
- f. Air Pathway
- g. Site Score

## 2. PREscore

- a. The PREscore Program
- b. Summary of the Site Score
- c. Ground Water Pathway – Likelihood of Release
- d. Ground Water Pathway – Waste Characteristics and Targets
- e. Additional Scoring Information

## 3. HRS Scoring

- a. Sources and Waste Characteristics
- b. Ground Water Pathway
- c. Surface Water Pathway
- d. Soil Exposure Pathway
- e. Air Pathway
- f. Site Score
- g. Contaminant Characteristics

Some of the data used in these scoresheets were derived from information about Roberts Solvent Reclamation that was given in the video. Other data were developed by the scorers to reflect conditions as they might have been at the hypothetical site.



# Appendix A.1: PA Scoring for Roberts Solvent Reclamation Site

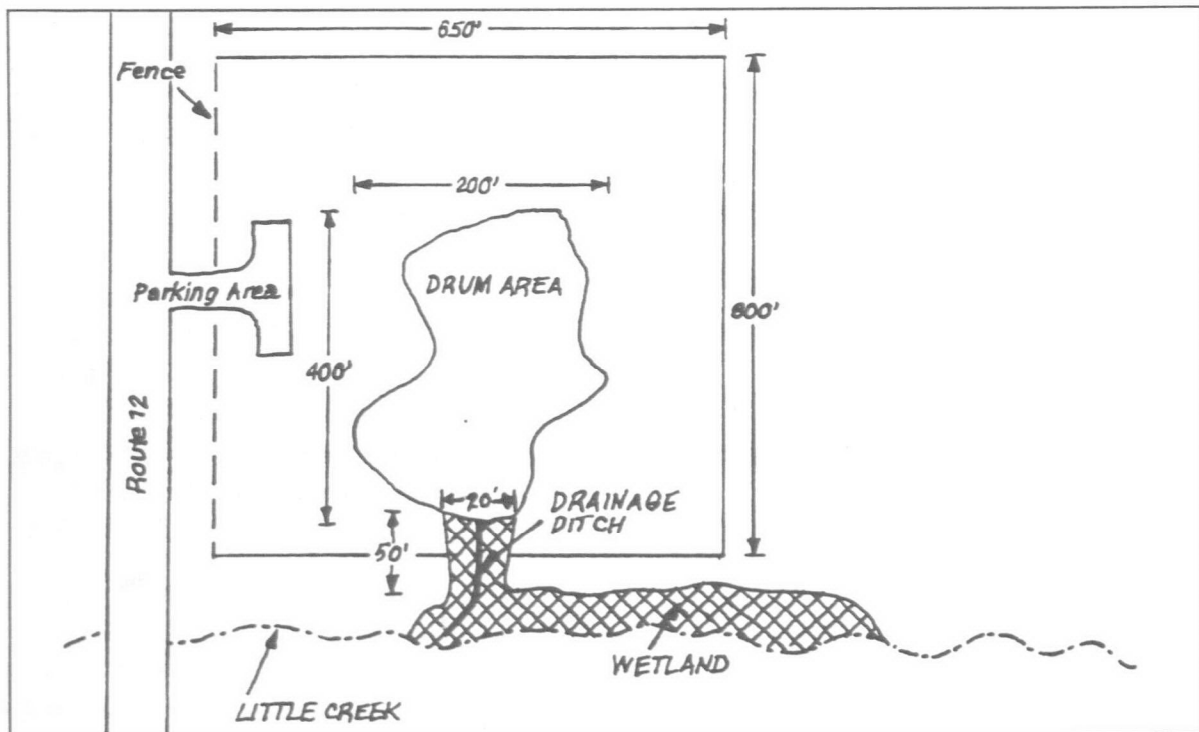
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## a. General Information

**(1) Site Description and Operational History:** Roberts Solvent Reclamation site is in a rural setting on Route 12 in Washington County, about three miles south of Westwood. The area of the site is approximately 12 acres. There have been reports of dozens of rusty drums onsite, some partially buried, rusting, and not maintained. The site is uphill from Little Creek, which flows into the Red River. There is a wetland nearby, and three miles downstream from the confluence of Little Creek and Red River there is a drinking water intake. The Roberts Solvent Reclamation owns the property and paid taxes from 1962 through 1985. The assumption is that the site remained active through 1985, and is now currently abandoned and inactive.

**(2) Probable Substances of Concern:** The drums at the site have not been maintained and have not been stored on concrete pads. There is a large area of stained soil under and adjacent to the drums. A drainage ditch leads to a wetland on the edge of Little Creek. The former foreman at the site confirmed the drums were the only containers of hazardous waste on the site and that used industrial solvents were contained in the drums. Substances usually documented at solvent reclamation sites include chlorinated solvents and other volatile organic compounds.

### (3) Site Sketch:



### b. Source Evaluation

Two sources were identified. Source 1 is a partially buried collection of drums, several hundred of which are visible at the surface. Source 2 is an area of stained soil around the drums and extending down a drainage ditch toward the wetland. All sources are uncontained and therefore have a containment factor value greater than zero for all pathways.

Source #1: The foreman at the company, who was interviewed during the PA, estimated the number of drums to be between 5,000 and 10,000. The drums are partially buried and visible at the surface. Source waste quantity calculation is based on 10,000 drums.

- Volume:  $10,000 \text{ drums} \div 10 = 1,000$  (PA Table 1)

Source #2: Based on measurements taken from plat maps at the tax assessors office, the area containing the drums and the stained soil is approximately 200 feet by 400 feet. The area of contaminated soil =  $80,000 \text{ ft}^2$ . The area of the ditch is approximately 50 feet by 20 feet, or  $1,000 \text{ ft}^2$ .

- Area:  $81,000 \text{ ft}^2 \div 34,000 = 2.38$  (PA Table 1)

$$\text{WQ} = 1,000 + 2.38 = 1002.38$$

$$\text{WQ of } 1002.38 = \text{WC of } 32 \text{ (PA Table 1b)}$$

$$\text{WC factor value} = 32 \text{ (all pathways)}$$

## SOURCE EVALUATION

Source No.: 1	Source Name: DRUMS	Source Waste Quantity (WQ) Calculations:
Source Description: PARTIALLY BURIED COLLECTION OF DRUMS;  SEVERAL HUNDRED VISIBLE AT SURFACE		$10,000 \div 10 = 1,000$

Source No.: 2	Source Name: CONTAMINATED SOIL	Source Waste Quantity (WQ) Calculations:
Source Description: AREA OF CONTAMINATED SOIL AROUND DRUMS & IN DITCH LEADING DOWN TO THE MARSH AND THE DITCH AREA		$200 \times 400 \text{ ft} = 80,000 \text{ ft}^2$ $\text{DITCH AREA} = 50 \text{ ft} \times 20 \text{ ft}$ $= 1000 \text{ ft}^2$ $\frac{81,000 \text{ ft}^2}{34,000} = 2.38$

Source No.:	Source Name:	Source Waste Quantity (WQ) Calculations:
Source Description:		

$WQ_1 + WQ_2 = WQ_{\text{TOTAL}}$   
 $1,000 + 2.38 = 1002.38$   
 CHECK PA TABLE 16

Site WC:  
 32



## c. Ground Water Pathway

**(1) Ground Water Use Within 4 miles of the Site:** Based on data from the US Geologic Survey, only one aquifer (non-karst) underlies the site. All private and municipal wells within the target distance limit (TDL) are screened in this aquifer. The screening depth of the nearest well is at 60 feet. There is no liner or essentially impervious base under any source. The depth to aquifer is 40 feet. There are five drinking water wells within the TDL. The nearest is a private well located 800 feet from the nearest source. Three private wells serving a total 14 people are located between 800 and 1,000 feet from the nearest source. Two municipal wells serving Westwood (population 4,500) are located 2,800 and 4,850 feet from the nearest source. The municipal supply is a rotational, not a blended, system and is used for watering commercial livestock. The municipal wells are not located within a wellhead protection area.

Well	Private or Municipal	Distance	Population Served
1	Private	800 feet	14
2	Private	925 feet	
3	Private	1,000 feet	
4	Municipal	2,800 feet	4500
5	Municipal	4,850 feet	

## (2) Calculations for Drinking Water Populations Served by Ground Water:

Distance Category	Number of People	Distance-weighted Population Value
0 to 1/4 mile	14	2
> 1/2 to 1 mile	4,500	167
TOTAL <sup>a/</sup>	---	169

<sup>a/</sup>values are zero for all other distance categories

Nearest Well factor value = 20 (PA Table 2a)

Distance-weighted population values: (PA Table 2a)

PA Table 2a: Non-Karst Aquifers

Distance from Site	Population	Nearest Well (choose highest)	Population Served by Wells Within Distance Category										Population Value	
			1 to 10	11 to 30	31 to 100	101 to 300	301 to 1,000	1,001 to 3,000	3,001 to 10,000	10,001 to 30,000	30,001 to 100,000	Greater than 100,000		
0 to 1/4 mile	14	20	1	2	5	16	52	163	521	1,633	5,214	16,325	2	
> 1/4 to 1/2 mile	0	18	1	1	3	10	32	101	323	1,012	3,233	10,121	0	
> 1/2 to 1 mile	4500	9	1	1	2	5	17	52	167	522	1,668	5,224	167	
> 1 to 2 miles		5	1	1	1	3	9	29	94	294	939	2,938		
> 2 to 3 miles		3	1	1	1	2	7	21	68	212	678	2,122		
> 3 to 4 miles		2	1	1	1	1	4	13	42	131	417	1,306		
Nearest Well =		20											Score =	169

**(3) Likelihood of Release:** Although sources are poorly contained and waste quantity is moderately large, a release to ground water is not suspected for the reasons outlined in the Ground Water Pathway Criteria List.

#### GROUND WATER PATHWAY CRITERIA LIST

SUSPECTED RELEASE			
Y	N	U	
e	o	n	
s		k	
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Are sources poorly contained?			
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
Is the source a type likely to contribute to ground water contamination (e.g., wet lagoon)?			
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Is waste quantity particularly large?			
<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Is precipitation heavy?			
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
Is the infiltration rate high?			
<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Is the site located in an area of karst terrain?			
<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Is the subsurface highly permeable or conductive?			
<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Is drinking water drawn from a shallow aquifer?			
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
Are suspected contaminants highly mobile in ground water?			
<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Does analytical or circumstantial evidence suggest ground water contamination?			
<input type="checkbox"/>	<input type="checkbox"/>	Other criteria? _____	
<input type="checkbox"/>	<input checked="" type="checkbox"/>	<b>SUSPECTED RELEASE?</b>	

- The precipitation levels are not heavy.
- The site is not located in an area of karst terrain.
- The ground beneath the site is not very permeable to water.
- The aquifer used for drinking water is moderately deep.
- The wells are upgradient from the site so contamination would be very unlikely.
- Contamination of the nearby private wells also is not suspected.

Likelihood of release is assigned a value of 500 because depth to aquifer is less than 70 feet.

No suspected release = 500

Likelihood of Release = 500

**(4) Targets:** No release is suspected, therefore all drinking water wells are considered secondary targets.

Secondary Target Population = 169 (PA Table 2a)

Nearest Well factor value = 20 (PA Table 2a)

Wellhead Protection Area = 0

Resources factor value = 5

Targets = 194 (169 + 20 + 0 + 5)

$$(5) \text{ Ground Water Pathway Score} = (500 \times 194 \times 32) \div 82,500 = 37.62$$

## GROUND WATER PATHWAY SCORESHEET

Pathway Characteristics	
Do you suspect a release (see Ground Water Pathway Criteria List, page 7)?	Yes <input type="checkbox"/> No <input type="checkbox"/>
Is the site located in karst terrain?	Yes <input type="checkbox"/> No <input type="checkbox"/>
Depth to aquifer:	_____ ft
Distance to the nearest drinking water well:	_____ ft

## LIKELIHOOD OF RELEASE

- SUSPECTED RELEASE:** If you suspect a release to ground water (see page 7), assign a score of 550. Use only column A for this pathway.
- NO SUSPECTED RELEASE:** If you do not suspect a release to ground water, and the site is in karst terrain or the depth to aquifer is 70 feet or less, assign a score of 500; otherwise, assign a score of 340. Use only column B for this pathway.

A	B
Suspected Release	No Suspected Release
(550)	(500 or 340)
	500
LR =	500

References

## TARGETS

- PRIMARY TARGET POPULATION:** Determine the number of people served by drinking water wells that you suspect have been exposed to a hazardous substance from the site (see Ground Water Pathway Criteria List, page 7).  
\_\_\_\_\_ people  $\times 10 =$
- SECONDARY TARGET POPULATION:** Determine the number of people served by drinking water wells that you do NOT suspect have been exposed to a hazardous substance from the site, and assign the total population score from PA Table 2.  
Are any wells part of a blended system? Yes ☐ No ☒  
If yes, attach a page to show apportionment calculations.
- NEAREST WELL:** If you have identified a primary target population for ground water, assign a score of 50; otherwise, assign the Nearest Well score from PA Table 2. If no drinking water wells exist within 4 miles, assign a score of zero.
- WELLHEAD PROTECTION AREA (WHPA):** If any source lies within or above a WHPA, or if you have identified any primary target well within a WHPA, assign a score of 20; assign 5 if neither condition holds but a WHPA is present within 4 miles; otherwise assign zero.
- RESOURCES**

T =

	169
(50, 30, 10, 5, 3, 2, = 0)	(30, 10, 5, 3, 2, = 0)
	20
(30, 5, = 0)	(30, 5, = 0)
	0
(5 = 0)	(5 = 0)
	5
T =	194

## WASTE CHARACTERISTICS

- If you have identified any primary target for ground water, assign the waste characteristics score calculated on page 4, or a score of 32, whichever is GREATER; do not evaluate part B of this factor.
- If you have NOT identified any primary target for ground water, assign the waste characteristics score calculated on page 4.

WC =

(100 = 32)	
(100, 32, = 10)	(100, 32, = 10)
	32
WC =	32

GROUND WATER PATHWAY SCORE:

$$\frac{LR \times T \times WC}{82,500}$$

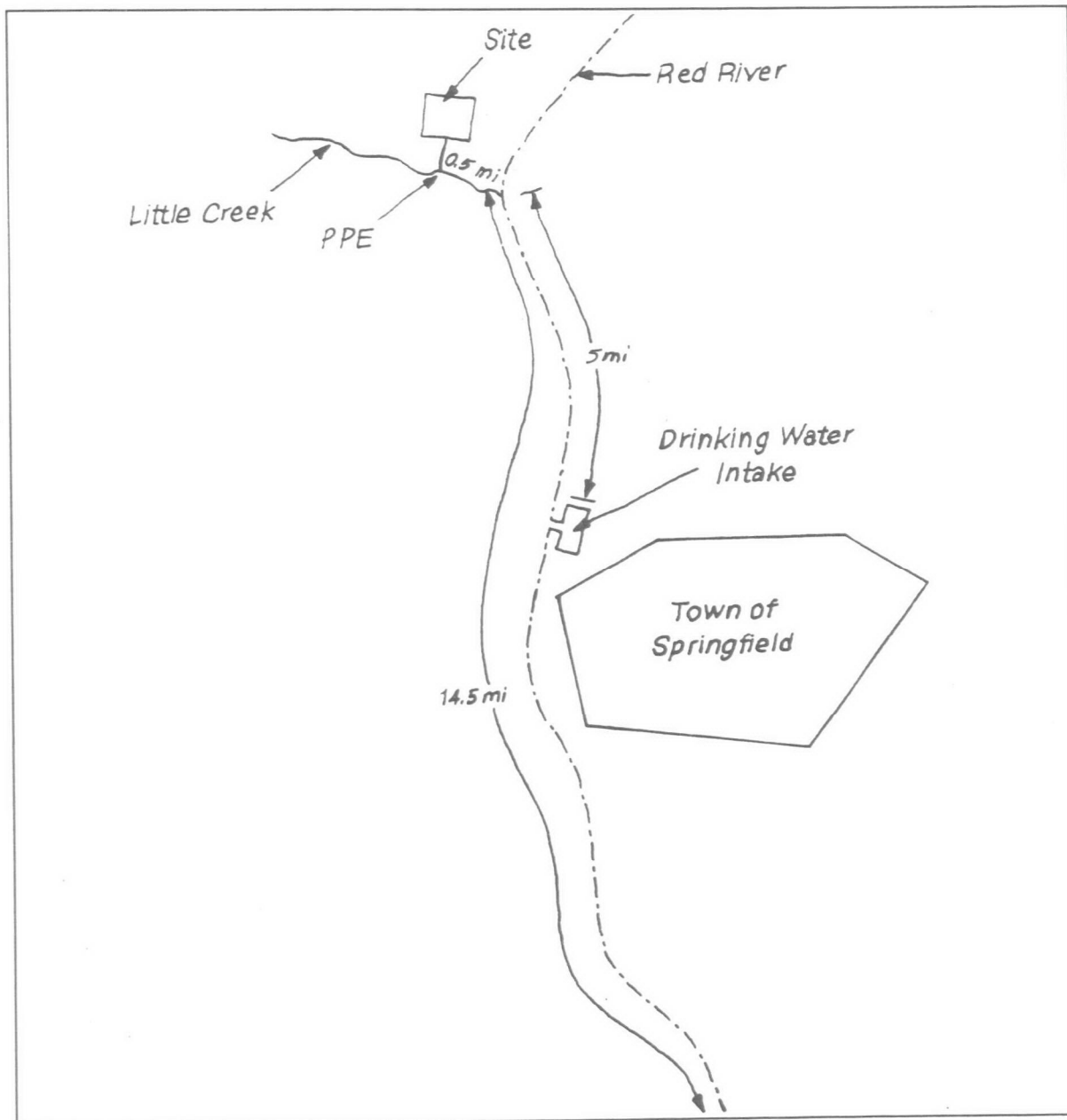
(subject to a maximum of 100)

37.62

## d. Surface Water Pathway

The probable point of entry (PPE) of contaminants to the creek is on the southern side of the site, in a wetland adjacent to Little Creek. Little Creek flows eastward for 0.5 miles until it joins the Red River. The Red River flows south to the edge of the TDL (14.5 miles from the confluence of Little Creek) with no significant tributary.

### (1) Surface Water Hazardous Substance Migration Path:



**(2) Likelihood of Release:** Surface water is nearby (the wetland and creek are just below the site), sources are poorly contained (the drums are on the ground and rusting), and a runoff route is well defined (the drainage ditch from the site clearly leads to the wetland). There is a moderately large amount of waste, and due to the stained soil and a clear drainage path to the water, there is a strong likelihood that the waste is being released into Little Creek. Based on professional judgment, Little Creek and the fish in the wetland could be contaminated. Therefore, likelihood of release is assigned maximum value (for suspected release).

Likelihood of Release = 550

#### SURFACE WATER PATHWAY

Pathway Characteristics	
Do you suspect a release (see Surface Water Pathway Criteria List, page 11)?	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
Distance to surface water:	150 ft
Flood frequency:	> 1500 yrs
What is the downstream distance to the nearest drinking water intake?	3 miles
Nearest fishery? <input checked="" type="checkbox"/> miles	Nearest sensitive environment? <input checked="" type="checkbox"/> miles

#### LIKELIHOOD OF RELEASE

- SUSPECTED RELEASE:** If you suspect a release to surface water (see page 11), assign a score of 550. Use only column A for this pathway.
- NO SUSPECTED RELEASE:** If you do not suspect a release to surface water, use the table below to assign a score based on distance to surface water and flood frequency. Use only column B for this pathway.

Distance to surface water $\leq$ 2,500 feet	500
Distance to surface water > 2,500 feet, and	
Site in annual or 10-year floodplain	500
Site in 100-year floodplain	400
Site in 500-year floodplain	300
Site outside 500-year floodplain	100

A	B	References
Suspected Release	No Suspected Release	
550 (550)	(100, 400, 300 = 100)	
LR = 550 (550)	(100, 400, 300 = 100)	

**(3) Drinking Water Threat Targets:** There is one drinking water intake within the TDL (three miles downstream from the confluence of Little Creek and Red River). The municipal intake serving Springfield is located on the Red River. The municipal supply is not blended and is used for irrigating commercial crops. Although a release to the watershed is suspected, no contamination is suspected at the Springfield intake because the intake is not especially close to the site and the Red River is rather large, so any contaminants released from the site will be diluted by the time they get that far downstream. The drinking water intake is considered a secondary target.

Intake Name	Water Body Type	Flow	People Served	Flow-weighted Population Value
Red River (municipal)	large stream to river	1857 cfs	5500	1

Nearest Intake factor value = 0 (PA Table 3)

Flow-weighted population values: (PA Table 3)

Secondary Target Population = 1 (PA Table 3)

Resources factor value = 5

Drinking Water Threat Targets = 6 (1 + 5 + 0)

PA TABLE 3: VALUES FOR SECONDARY SURFACE WATER TARGET POPULATIONS

Surface Water Body Flow (see PA Table 4)	Population	Nearest Intake (choose highest)	Population Served by Intakes Within Flow Category											Population Value
			7 to 30	31 to 100	101 to 300	301 to 1,000	1,001 to 3,000	3,001 to 10,000	10,001 to 30,000	30,001 to 100,000	100,001 to 300,000	300,001 to 1,000,000	Greater than 1,000,000	
<10 cfs	0	20	2	5	18	52	183	521	1,833	5,214	16,325	52,136	163,248	0
10 to 100 cfs	0	2	1	1	2	5	18	52	183	521	1,633	5,214	16,325	0
>100 to 1,000 cfs	0	1	0	0	1	1	2	5	16	52	183	521	1,633	0
>1,000 to 10,000 cfs	5500	0	0	0	0	0	1	1	2	5	16	52	183	1
>10,000 cfs or Great Lakes	0	0	0	0	0	0	0	0	1	1	2	5	16	0
3-mile Mixing Zone	0	10	1	3	8	26	82	261	816	2,607	8,162	26,068	81,663	0
Nearest Intake =		0												Score = 1

## DRINKING WATER THREAT TARGETS

3. Record the water body type, flow (if applicable), and number of people served by each drinking water intake within the target distance limit. If there is no drinking water intake within the target distance limit, factors 4, 5, and 6 each receive zero scores.

Intake Name	Water Body Type	Flow	People Served
RED RIVER - (MUNICIPAL - SPRINGFIELD)	RIVER	1867 cfs	5500
		cfs	
		cfs	

4. PRIMARY TARGET POPULATION: If you suspect any drinking water intake listed above has been exposed to a hazardous substance from the site (see Surface Water Pathway Criteria List, page 11), list the intake name(s) and calculate the factor score based on the total population served.

\_\_\_\_\_ people x 10 = \_\_\_\_\_

5. SECONDARY TARGET POPULATION: Determine the number of people served by drinking water intakes that you do NOT suspect have been exposed to a hazardous substance from the site, and assign the total population score from PA Table 3.

Are any intakes part of a blended system? Yes \_\_\_\_\_ No ☒   
 If yes, attach a page to show apportionment calculations.

6. NEAREST INTAKE: If you have identified a primary target population for the drinking water threat (factor 4), assign a score of 50; otherwise, assign the Nearest Intake score from PA Table 3. If no drinking water intake exists within the target distance limit, assign a score of zero.

7. RESOURCES

T =



**(4) Human Food Chain Threat Targets:** There are two fisheries within the TDL: Little Creek from the probable point of entry (PPE) to the confluence with the Red River, and the Red River from the confluence with Little Creek to the edge of the TDL. Since the wetland is considered part of the Little Creek fishery and the wetland is already suspected of being contaminated, the Little Creek fishery is considered a primary target. However, because the flow in the Red River is so much greater than that of Little Creek, the amount of hazardous substances flowing down Little Creek is not likely to contaminate the Red River fishery. The Red River fishery thus is considered a secondary target.

Fishery Name	Water Body Type	Flow
Little Creek	small to moderate stream	10-100 cfs
Red River	large stream to river	1857 cfs

Primary Fishery factor value = 300

Secondary Fishery factor value = 0

Human Food Chain Threat Targets = 300

#### HUMAN FOOD CHAIN THREAT TARGETS

8. Record the water body type and flow (if applicable) for each fishery within the target distance limit. If there is no fishery within the target distance limit, assign a Targets score of 0 at the bottom of the page.

Fishery Name	Water Body Type	Flow
LITTLE CREEK	STREAM	10-100 cfs
RED RIVER	RIVER	1857 cfs
		cfs
		cfs
		cfs

9. PRIMARY FISHERIES: If you suspect any fishery listed above has been exposed to a hazardous substance from the site (see Surface Water Criteria List, page 11), assign a score of 300 and do not evaluate Factor 10. List the primary fisheries:

LITTLE CREEK

#### 10. SECONDARY FISHERIES

- A. If you suspect a release to surface water and have identified a secondary fishery but no primary fishery, assign a score of 210.
- B. If you do not suspect a release, assign a Secondary Fisheries score from the table below using the lowest flow at any fishery within the target distance limit.

Lowest Flow	Secondary Fisheries Score
< 10 cfs	210
10 to 100 cfs	30
> 100 cfs, coastal tidal waters, oceans, or Great Lakes	12

T =

300

(210, 30, 12 = 0)



**(6) Surface Water Pathway Threat Scores**

Threat	Likelihood of Release Score	Targets Score	Waste Characteristics Score	Threat Score (LRxTxWC) ÷ 82,500
Drinking Water	550	6	32	1.28
Human Food Chain	550	300	32	64
Environmental	550	300	32	60 (capped)

**(7) Surface Water Pathway Score =  $(1.28 + 64 + 60) = 100$  (capped)**

**e. Soil Exposure Pathway**

**(1) Likelihood of Exposure:** Surficial contamination is suspected at the site. The drums are not maintained and not stored on concrete pads. There is a large area of stained soil under and adjacent to the drums. There is no cover present at the site. There is no qualitative or analytical data that would rule out suspected contamination. Therefore, contamination is suspected.

Likelihood of Exposure = 550

**(2) Resident Population Threat Targets:** There are no residents, schools, or daycare facilities within 200 feet of the area of suspected contamination. There is no residence, school, or daycare facility located on any adjacent land nor is there a migration route that could spread hazardous substances near residences, schools, or daycare facilities. There are no workers on the facility property. There are no terrestrial sensitive environments on the area of suspected contamination.

Resident Population factor value = 0

Resident Individual factor value = 0

Worker factor value = 0

Terrestrial sensitive environments factor value = 0

Resources factor value = 5

Resident Population Threat Targets = 5

**(3) Resident Population Threat Score:  $(550 \times 5 \times 32) \div 82,500 = 1.07$**

**(4) Nearby Population Threat Score: 1** (because there are < 10,000 people within 1 mile)

**(5) Soil Exposure Pathway Score =  $(1.07 + 1) = 2.07$**

## SOIL EXPOSURE PATHWAY SCORESHEET

Pathway Characteristics	
Do any people live on or within 200 ft of areas of suspected contamination?	Yes ___ No <u>✓</u>
Do any people attend school or daycare on or within 200 ft of areas of suspected contamination?	Yes ___ No <u>✓</u>
Is the facility active? Yes ___ No ___ If yes, estimate the number of workers: _____	

## LIKELIHOOD OF EXPOSURE

1. SUSPECTED CONTAMINATION: Surficial contamination can generally be assumed, and a score of 550 assigned. Assign zero only if the absence of surficial contamination can be confidently demonstrated.

LE =

Suspected  
Contamination  
(100 = 0)

550

References

## RESIDENT POPULATION THREAT TARGETS

2. RESIDENT POPULATION: Determine the number of people occupying residences or attending school or daycare on or within 200 feet of areas of suspected contamination (see Soil Exposure Pathway Criteria List, page 18).

\_\_\_\_\_ people x 10 =

3. RESIDENT INDIVIDUAL: If you have identified a resident population (factor 2), assign a score of 50; otherwise, assign a score of 0.

4. WORKERS: Use the following table to assign a score based on the total number of workers at the facility and nearby facilities with suspected contamination:

Number of Workers	Score
0	0
1 to 100	5
101 to 1,000	10
> 1,000	15

5. TERRESTRIAL SENSITIVE ENVIRONMENTS: Use PA Table 7 to assign a value for each terrestrial sensitive environment on an area of suspected contamination:

Terrestrial Sensitive Environment Type	Value
_____	_____
_____	_____
_____	_____

Sum =

6. RESOURCES

T =

## WASTE CHARACTERISTICS

7. Assign the waste characteristics score calculated on page 4.

WC =

(100, 32, or 10)

32

RESIDENT POPULATION THREAT SCORE:

$$\frac{LE \times T \times WC}{82,500}$$

Subject to a maximum of 100

1.07

NEARBY POPULATION THREAT SCORE:

(4, 2, or 1)

1

SOIL EXPOSURE PATHWAY SCORE:

Resident Population Threat + Nearby Population Threat

Subject to a maximum of 100

2.07

## f. Air Pathway

**(1) Likelihood of Release:** Poorly maintained drums are present on the site which contain solvents that could be released to the air. Although there are no odors and no release of hazardous substances to the air has been directly observed, circumstantial evidence such as surficial contamination suggests a suspected release to the air pathway.

Suspected Release = 550

Likelihood of Release = 550

**(2) Targets:** All targets are not suspected to be contaminated and thus are considered secondary targets. The nearest individual is a resident located 800 feet from the nearest source. The entire population of Westwood (4,500) is between 5,400 and 9,900 feet from the nearest source. The wetland, located just offsite, is approximately 1.1 acres in size. No resources are located within 1/2 mile of the site.

Distance Category	Number of People	Distance-weighted Population Value
>0 to 1/4 mile	1	1
>1 to 2 miles	4500	3
TOTAL <sup>a/</sup>	---	4

<sup>a/</sup>values are zero for all other distance categories

Nearest individual = 20 (PA Table 8)

Distance-weighted population values: (PA Table 8)

Secondary target population factor value = 4

Secondary sensitive environments factor value = 0.6

Resources factor value = 0

Targets = 24.6 (4 + 20 + 0 + 0.6)

PA TABLE 8: VALUES FOR SECONDARY AIR TARGET POPULATIONS

Distance from Site	Population	Nearest Individual (choose highest)	Population Within Distance Category													Population Value
			1	11	31	101	301	1,001	3,001	10,001	30,001	100,001	300,001	Greater		
			to	to	to	to	to	to	to	to	to	to	to	than		
			10	30	100	300	1,000	3,000	10,000	30,000	100,000	300,000	1,000,000	1,000,000		
Onsite	<u>0</u>	20	1	2	5	16	52	163	521	1,633	5,214	16,325	52,136	163,246	<u>0</u>	
>0 to 1/4 mile	<u>1</u>	20	1	1	1	4	13	41	130	408	1,303	4,081	13,034	40,811	<u>1</u>	
> 1/4 to 1/2 mile	<u>0</u>	2	0	0	1	1	3	9	28	88	282	882	2,815	8,815	<u>0</u>	
> 1/2 to 1 mile	<u>0</u>	1	0	0	0	1	1	3	8	26	83	261	834	2,612	<u>0</u>	
> 1 to 2 miles	<u>4500</u>	0	0	0	0	0	1	1	3	8	27	83	266	833	<u>3</u>	
> 2 to 3 miles	<u>0</u>	0	0	0	0	0	1	1	1	4	12	38	120	376	<u>0</u>	
> 3 to 4 miles	<u>0</u>	0	0	0	0	0	0	1	1	2	7	23	73	229	<u>0</u>	
Nearest Individual =		20														Score =
																4

## AIR PATHWAY SCORESHEET

Pathway Characteristics			
Do you suspect a release (see Air Pathway Criteria List, page 21)?		Yes	No
Distance to the nearest individual:		_____ ft	

LIKELIHOOD OF RELEASE	A Suspected Release (100)	B No Suspected Release (500)	References
1. SUSPECTED RELEASE: If you suspect a release to air (see page 21), assign a score of 550. Use only column A for this pathway.	550		
2. NO SUSPECTED RELEASE: If you do not suspect a release to air, assign a score of 500. Use only column B for this pathway.			
LR =	550		

TARGETS	A Suspected Release (100)	B No Suspected Release (500)	References								
3. PRIMARY TARGET POPULATION: Determine the number of people subject to exposure from a suspected release of hazardous substances to the air. _____ people x 10 =											
4. SECONDARY TARGET POPULATION: Determine the number of people not suspected to be exposed to a release to air, and assign the total population score using PA Table 8.	4										
5. NEAREST INDIVIDUAL: If you have identified any Primary Target Population for the air pathway, assign a score of 50; otherwise, assign the Nearest Individual score from PA Table 8.	20										
6. PRIMARY SENSITIVE ENVIRONMENTS: Sum the sensitive environment values (PA Table 5) and wetland acreage values (PA Table 9) for environments subject to exposure from a suspected release to the air.											
<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 80%;">Sensitive Environment Type</th> <th style="width: 20%;">Value</th> </tr> </thead> <tbody> <tr><td> </td><td> </td></tr> <tr><td> </td><td> </td></tr> <tr><td> </td><td> </td></tr> </tbody> </table>	Sensitive Environment Type	Value									
Sensitive Environment Type	Value										
Sum =											
7. SECONDARY SENSITIVE ENVIRONMENTS: Use PA Table 10 to determine the score for secondary sensitive environments.											
8. RESOURCES	0.6										
T =	24.6										

WASTE CHARACTERISTICS	A Suspected Release (100)	B No Suspected Release (500)	References
9. A. If you have identified any Primary Target for the air pathway, assign the waste characteristics score calculated on page 4, or a score of 32, whichever is GREATER; do not evaluate part B of this factor.			
B. If you have NOT identified any Primary Target for the air pathway, assign the waste characteristics score calculated on page 4.	32		
WC =	32		

AIR PATHWAY SCORE:	$\frac{LR \times T \times WC}{82,500}$	<div style="border: 1px solid black; padding: 5px; display: inline-block;">             Adjusted to a maximum of 100  <b>5.28</b> </div>
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$$(3) \text{ Air Pathway Score} = (550 \times 24.6 \times 32) \div 82,500 = 5.28$$

## g. Site Score:

Ground Water Pathway = 37.62

Surface Water Pathway = 100

Soil Exposure Pathway = 2.07

Air Pathway = 5.28

Site Score =

$$\sqrt{\frac{(37.62)^2 + (100)^2 + (2.07)^2 + (5.28)^2}{4}} = 53.50$$





# Appendix A.2: PREscore for Roberts Solvent Reclamation Site

## a. The PREscore Program

The PREscore computer program was developed by EPA to assist HRS scoring by generating a preliminary ranking evaluation score and associated documentation. From raw data, PREscore calculates HRS factor values, factor category values, pathway scores, and site scores. The PREscore software reduces time involved in developing site scores and minimizes potential math errors in scoring. The PREprint component of PREscore generates HRS scoresheets, an HRS documentation record, and EPA's NPL Characteristics Data Collection Form.

This section of the guide shows a few sample screens from the PREscore program illustrating the (hypothetical) ground water pathway scoring using data developed for the Roberts Solvent Reclamation site. It is not intended to be used as a tutorial, but rather to present an example of how the program can help facilitate scoring. For more details on using this software, refer to the *PREscore Users Manual and Tutorial* (see Appendix D) or call your EPA Regional computer contact.

## b. Summary of the Site Score

The first screen that the scorer encounters after two introductory screens is the summary screen; Exhibit 1 displays this screen for the Roberts Reclamation site. The summary screen is a matrix of cells containing factor category values within pathways, such as ground water likelihood of release or drinking water threat targets. To enter data, the scorer accesses a category and pathway through this summary screen by moving to the appropriate cell in the matrix and presses "Enter".

EXHIBIT 1: Summary Screen

Roberts Solvent Reclamation

site score 50.08

PREscore Version 1.1				
Pathway	Likelihood of Release	Waste Characteristics	Targets	Pathway Score
Ground Water	240	10	1.94E+02	5.64
Drinking Water	550	32	5.50E+00	1.17
Food Chain	550	320	4.50E+01	96.06
Environmental	550	320	2.50E+01	53.33
Surface Water	Overland Flow, F7 to Toggle			100.00
Resident	0	0	0.00E+00	0.00
Nearby	5	32	1.00E+00	0.00
Soil Exposure				0.00
Air	450	10	1.26E+01	0.71

## c. Ground Water Pathway — Likelihood of Release

When a cell is selected from the matrix, PRescore displays data entry screens for the factor selected, allows the scorer to enter information, and then calculates the factor score. The screen shown in Exhibit 2 contains information on factors to evaluate likelihood of release to ground water.

EXHIBIT 2: Ground Water Likelihood of Release Screen

Roberts Solvent Reclamation

Ground Water -> Likelihood of Release -> aquifer-1		
Factor Category and Factors	Max	Value
Observed Release	550	0
a. Containment	10	10
Net Precipitation (inches)		22.0
b. Precipitation Factor	10	6
c. Depth to Aquifer	5	3
d. Travel Time	35	15
Potential to Release = $a * (b + c + d)$	500	240
Likelihood of Release	550	240

In PRescore, the scorer enters information for the values in the highlighted cells on this screen. For some cells, data are entered directly on the screen. For example at the Roberts Reclamation site, the scorer moved the cursor to net precipitation and entered the inches of precipitation for the site (22 inches) directly into that cell. PRescore interpreted that number and assigned a value of 6 for the precipitation factor.

Other data, for example, depth to aquifer, are entered by selecting the cell on this screen and accessing a secondary data entry screen. Exhibit 3 shows the data entry screen for depth to aquifer for the Roberts Reclamation site.

EXHIBIT 3: Ground Water Likelihood of Release, Depth to Aquifer Screen

Roberts Solvent Reclamation

Ground Water -> Potential to Release -> Depth to Aquifer/Hydr. Conduct.	
Factors	Value
Depth of Contamination (feet)	20.00
Depth to Aquifer from Surface (feet)	60.00
Are All Layers Karst?	NO
Total Thickness of Layer(s) With Lowest Conductivity (ft)	10.00
Hydraulic Conductivity of Layer(s) (cm/sec)	1.E-06

The scorer entered information on the depth of contamination, depth to aquifer, presence of karst, thickness of the conductive layer, and hydraulic conductivity. PRescore interpreted these data and assigned a depth to aquifer factor value of 3, which was carried forward to the appropriate cell in the ground water likelihood of release data entry screen (Exhibit 2).

At the likelihood of release data entry screen, the scorer entered data for the other factors to be evaluated — observed release and containment. Travel time was calculated by PRescore based on the information entered in the depth to aquifer data entry screen. With these data, PRescore calculated a value of 240 for ground water likelihood of release. This value is displayed on the ground water likelihood of release data entry screen and then carried to the summary screen.

## d. Ground Water Pathway — Waste Characteristics and Targets

For the Roberts Reclamation site, the scorer entered data on waste characteristics and targets for the ground water pathway in a similar manner, accessing a series of data entry screens. Exhibits 4 and 5 contain data on factors to evaluate waste characteristics and targets, respectively, at the Roberts Reclamation site.

### EXHIBIT 4: Waste Characteristics Data Entry Screen

Roberts Solvent Reclamation

Waste Characteristics -> Sources				
Source Name	Migration Pathways	Vol/Area Value	Wastestream Value	HWQ Value
1 drums	GW-SW-SE-A	6.50E+02	6.50E+02	6.50E+02
2 stained soil	GW-SW-SE-A	2.35E+00	0.00E+00	2.35E+00

Each factor in the waste characteristics data entry was evaluated by entering data in a series of data entry screens. When evaluating waste volume/area and wastestream, the scorer identified substances in each source in a master list of contaminants that contains values for toxicity, mobility, health and ecological benchmarks, and other substance-specific HRS factors. Based on the identified substances, PRescore determined contaminant characteristics values, and combined these with hazardous waste quantity values, to yield a waste characteristics value for each pathway.

## EXHIBIT 5: Targets Data Entry Screen

Roberts Solvent Reclamation

Ground Water -> Targets ->		
Factor Category and Factors	Max	Value
Distance to Nearest Well (miles)	50	20 / 0.150
Population Potential Contamination	**	1.69E+02
Population Level I Concentrations	**	0.00E+00
Population Level II Concentrations	**	0.00E+00
Population	**	1.69E+02
Resources	5	5.00E+00
Wellhead Protection Area (WHPA)	20	0.00E+00
Ground Water Targets Total (this aquifer only)	**	1.94E+02
Ground Water Targets Total (incl. overlying aquifers)	**	1.94E+02

As with the sample screens for likelihood of release and waste characteristics, the data entry screen for targets accesses reference tables for values contained in the HRS tables for entry of populations, resources, and wellhead protection areas (WHPA). The scorer selected each cell in the data entry screen and, in the case of population data, accessed a secondary data entry screen for entering population by distance category, as shown in Exhibit 6.

## EXHIBIT 6: Ground Water Pathway Population Data Entry Screen

Roberts Solvent Reclamation

Ground Water -> Targets -> Population -> aquifer-1				
Potential Population by Distance (Exclude wells listed below)	Population	Data Type	Population Incls.Pot.Wells	Score
0 to 1/4 mile	14.0		14.0	1.70E+00
Greater than 1/4 to 1/2 mile	0.0		0.0	0.00E+00
Greater than 1/2 to 1 mile	4500.0		4500.0	1.67E+02
Greater than 1 to 2 miles	0.0		0.0	0.00E+00
Greater than 2 to 3 miles	0.0		0.0	0.00E+00
Greater than 3 to 4 miles	0.0		0.0	0.00E+00

For data entry of resources and WHPA data entry, the scorer selected a response from a table of acceptable responses. PRescore assigned the corresponding value. Distance to nearest well was entered directly on the data entry screen.

## e. Additional Scoring Information

After data entry was completed for all pathways at the Roberts Reclamation site, a pathway score of 5.64 was calculated by PRescore and displayed on the summary screen. Then the scorer accessed the factor categories for the other three pathways. When data for factor categories for all pathways had been entered, PRescore calculated and displayed the final site score of 50.08 on the summary screen, as shown in Exhibit 1.

# Appendix A.3: HRS Scoring for Roberts Solvent Reclamation Site

## a. Sources and Waste Characteristics

Source Descriptions: Two sources were identified in the PA and SI. Source 1 is a partially buried collection of drums, several hundred of which are visible at the surface. Source 2 is an area of stained soil around the drums and extending down a drainage ditch toward the wetland. Both sources are uncontained and have a containment factor value greater than zero for all pathways.

### (1) Hazardous Waste Quantity (HWQ) Calculations:

Source 1: Former foreman at company interviewed during PA estimated number of drums to be between 5,000 and 10,000. Waste manifests obtained during SI documented approximately 6,500 drums. HWQ calculation based on 6,500 drums.

- Wastestream:  $6,500 \text{ drums} \times 2,000 \text{ lbs/4 drums} = 3,250,000 \text{ lbs}$  (Table 2-5 of HRS rule)  
 $3,250,000 \text{ lbs} \div 5,000 = 650$  (Table 2-5 of HRS rule)
- Volume:  $6,500 \text{ drums} \times 50 \text{ gallons/drum} = 325,000 \text{ gallons}$  (Table 2-5 of HRS rule)  
 $325,000 \text{ gallons} \div 500 = 650$  (Table 2-5 of HRS rule)

Source 2: Area of contaminated soil delineated by samples = 80,000 ft<sup>2</sup>  
 Area of contaminated soil in drainage ditch = 1,000 ft<sup>2</sup>

- Area:  $81,000 \text{ ft}^2 \div 34,000 = 2.37$  (Table 2-5 of HRS rule)

$$WQ = 650 + 2.37 = 652.37$$

WQ of 652.37 = HWQ of 100 (Table 2-6 of HRS rule)

HWQ factor value = 100 (all pathways)

(2) **Source Hazardous Substance Summary:** All hazardous substances are associated with all sources; all sources have a containment factor greater than zero for all pathways. See Section f for more details on the contaminant characteristics

Hazardous Substance	Toxicity	GW Toxicity/ Mobility	SW-DWT Toxicity/ Persistence	SW-HFCT Toxicity/ Persistence/ Bioaccumulation	SW-ET Ecotoxicity/ Persistence/ Bioaccumulation	Air Toxicity/ Mobility
PCBs	10,000	0.00002	10,000	500,000,000	500,000,000	2
Benzene	100	100	40	200,000	2,000,000	100
Tetrachloroethane (PCE)	100	0.1	40	2,000	2,000	100
Trichloroethylene (TCE)	10	1	4	200	200	10

## b. Ground Water Pathway

**(1) Likelihood of Release:** Only one aquifer (non-karst) underlies the site. All private and municipal wells within the target distance limit (TDL) are screened in this aquifer. The screening depth of the nearest well is at 60 feet, 40 feet below the deepest source. There is no liner or essentially impervious base under any source. The lowest conductivity layer beneath the site is a loess deposit 10 feet thick. No contamination was found above background in any well sampled. Therefore, no observed release is established, and potential to release is evaluated.

Containment = 10 (Table 3-2 of HRS rule)

Net Precipitation = 6 (Figure 3-2 of HRS rule)

Depth to Aquifer = 3 (Table 3-5 of HRS rule)

Travel Time = 15 (Table 3-7 of HRS rule)

Potential to Release =  $10 \times (6 + 3 + 15) = 240$

Likelihood of Release = 240

**(2) Waste Characteristics:** No observed release is established, therefore mobility is based solely on contaminant characteristics. All substances were deposited as liquids.

Toxicity/Mobility = 100 (Benzene, see a.(2) above)

Hazardous Waste Quantity = 100 (see a.(1) above)

Waste Characteristics Product =  $100 \times 100 = 10,000$

Waste Characteristics = 10 (Table 2-7 of HRS Rule)

**(3) Targets:** No observed release is established, therefore all targets are considered subject to potential contamination. The nearest well is a private well located 800 feet from the nearest source. There are five drinking water wells within the TDL. Three private wells serving 14 people are located between 800 and 1,000 feet from the nearest source. Two municipal wells serving Westwood (population 4,500) are located 2,800 and 4,850 feet from the nearest source. The municipal supply is not blended, but is used for watering commercial livestock. The municipal wells are not located within a wellhead protection area.

Nearest Well factor value = 20 (Table 3-11 of HRS rule)

Distance-weighted population values: (Table 3-12 of HRS rule)

Distance Category	Number of People	Distance-weighted Population Value
0 to 1/4 mile	14	17
> 1/2 to 1 mile	4,500	1,669
TOTAL <sup>a/</sup>	---	1,686

<sup>a/</sup>values are zero for all other distance categories

Population/potential contamination factor value =  $1,686 \div 10 = 168.6$  (rounds to 169)

Resources factor value = 5

Wellhead Protection Area factor value = 0

Targets = 194 ( $20 + 169 + 5 + 0$ )

**(4) Ground Water Pathway Score =  $(240 \times 10 \times 194) \div 82,500 = 5.64$**

## c. Surface Water Pathway

### *Hazardous Substance Migration Path*

The probable point of entry (PPE) is on the southern side of the site, in a wetland adjacent to Little Creek. Little Creek flows eastward for 0.5 miles until it joins the Red River. The Red River flows south to the TDL (14.5 miles from the confluence of Little Creek) with no significant tributary.

### *Drinking Water Threat*

**(1) Likelihood of Release:** An observed release to surface water is established based on elevated levels of PCBs in sediment samples from the wetland adjacent to Little Creek. Therefore, likelihood of release is assigned maximum value (for observed release).

Likelihood of Release = 550

**(2) Waste Characteristics:** Toxicity/persistence is based on contaminant characteristics.

Toxicity/Persistence = 10,000 (PCBs, see a.(2) above)

Hazardous Waste Quantity = 100 (see a.(1) above)

Waste Characteristics Product =  $10,000 \times 100 = 1,000,000$

Waste Characteristics = 32 (Table 2-7 of HRS Rule)

**(3) Targets:** There is one drinking water intake within the TDL. The municipal intake serving Springfield (population 5,500) is located on the Red River. The municipal supply is not blended, but is used for irrigating commercial crops. Although an observed release to the watershed is established, no contamination was found above background in sediment samples taken at the Springfield intake. Therefore, all drinking water targets are considered subject to potential contamination. The average annual flow for the Red River at Springfield is 1,857 cfs.

Dilution weight for Springfield intake = 0.001 (Table 4-13 of HRS rule)

Nearest Intake factor value =  $(20 \times 0.001) = 0.02$ ; rounds to 0 (Section 4.1.2.3.1 of HRS rule)

Distance-weighted population values: (Table 4-14 of HRS rule)

Dilution Category	Number of People	Dilution-weighted Population Value
0.001	5,500	5
TOTAL <sup>a/</sup>	---	5

<sup>a/</sup>values are zero for all other dilution categories, Table 4-13 of HRS rule

Population/potential contamination factor value =  $5 \div 10 = 0.5$

Resources factor value = 5

Drinking Water Threat Targets = 5.5 ( $0 + 0.5 + 5$ )

**(4) Drinking Water Threat Score =  $(550 \times 32 \times 5.5) \div 82,500 = 1.17$**

**Human Food Chain Threat**

**(1) Likelihood of Release:** Likelihood of release is assigned the same value as in the Drinking Water Threat.

Likelihood of Release = 550

**(2) Waste Characteristics:** Toxicity/persistence/bioaccumulation is based on contaminant characteristics.

Toxicity/Persistence/Bioaccumulation = 500,000,000 (PCBs, see a.(2) above)

Hazardous Waste Quantity = 100 (see a.(1) above)

Waste Characteristics Product = 500,000,000 x 100 = 50,000,000,000

Waste Characteristics = 320 (Table 2-7 of HRS Rule)

**(3) Targets:** There are two fisheries within the TDL: Little Creek from the probable point of entry (PPE) to the confluence with the Red River, and the Red River from the confluence with Little Creek to the TDL. Sediment samples in the wetland adjacent to Little Creek established an observed release for PCBs. Because PCBs have a bioaccumulation factor value of 500 or greater, a portion of the fishery in Little Creek is subject to actual contamination (Level II). The remainder of the Little Creek fishery, and the Red River fishery, are considered subject to potential contamination. The average annual flow for Little Creek is estimated to be between 10 and 100 cfs. No human food chain production data are available for either fishery, so the default value for fishery productivity is assigned (Section 4.1.3.3.2.3 of HRS rule).

Nearest Fishery factor value = 45 (Level II concentrations; Section 4.1.3.3.2.3 of HRS rule)

Level II population value = 0.03 (Table 4-18 of HRS rule)

Dilution-weighted population values: (Table 4-18 of HRS rule)

Fishery	Dilution Category	Human Food Chain Population Value	Dilution-weighted Population Value
Little Creek	0.1	0.03 <sup>a/</sup>	0.003
Red River	0.001	0.03 <sup>a/</sup>	0.00003
TOTAL	---	---	0.00303

<sup>a/</sup>minimum value assigned to fishery in absence of production data

Potential contamination factor value = 0.00303 ÷ 10 = 0.0003

Human Food Chain Threat Targets = 45.0303 (45 + 0.03 + 0.0003)

**(4) Human Food Chain Threat Score = (550 x 320 x 45.0303) ÷ 82,500 = 96.06**



**Environmental Threat**

**(1) Likelihood of Release:** Likelihood of release is assigned the same value as in the Drinking Water Threat.

$$\text{Likelihood of Release} = 550$$

**(2) Waste Characteristics:** Ecotoxicity/persistence/bioaccumulation is based on contaminant characteristics.

Ecotoxicity/Persistence/Bioaccumulation = 500,000,000 (PCBs, see a.(2) above)

Hazardous Waste Quantity = 100 (see a.(1) above)

Waste Characteristics Product = 500,000,000 x 100 = 50,000,000,000

Waste Characteristics = 320 (Table 2-7 of HRS Rule)

**(3) Targets:** The wetland adjacent to Little Creek meets the HRS definitional criteria for a sensitive environment within the TDL. Sediment samples in the wetland established an observed release for PCBs at the PPE and a point approximately 800 feet from the PPE. The entire length of the wetland between these two points (approximately 825 feet of linear frontage) is subject to actual contamination (Level II). The remainder of the wetland (approximately 225 feet of linear frontage) is considered subject to potential contamination.

Wetlands rating values:

- Portion of wetland subject to Level II concentrations = 25 (Table 4-24 of HRS Rule)
- Portion of wetland subject to potential contamination is less than 0.1 mile, therefore a value of 0 is assigned (Table 4-24 of HRS Rule)

Level II concentrations factor value = 25

Potential contamination factor value = 0

Environmental Threat Targets = 25 (25 + 0)

**(4) Environmental Threat Score =  $(550 \times 320 \times 25) \div 82,500 = 53.33$**

**Surface Water Pathway Score =  $(1.17 + 96.06 + 53.33) = 100$  (capped)**

## d. Soil Exposure Pathway

### *Resident Population Threat*

There are no residents or workers on sources. Therefore, the resident population threat receives a score of zero.

### *Nearby Population Threat*

Two areas of actual contamination are established based on samples around the drum area and the drainage ditch. Therefore, the Nearby Population Threat is evaluated.

**(1) Likelihood of Exposure:** Likelihood of exposure is evaluated based on attractiveness/accessibility and area of contamination. Although there is a fence on the western side of the site (along the road), the rest of the site is unfenced and easily accessible. However, there is no documented recreational use of the site (e.g., no one appears to walk through or stand on the site when fishing in the wetland or Little Creek, there are no bike trails on the site).

Attractiveness/Accessibility = 10 (Accessible, no public recreation use; Table 5-6 of HRS rule)

Area of Contamination =  $80,550 \text{ ft}^2 = 20$  (Table 5-7 of HRS rule)

Likelihood of Exposure = 5 (Table 5-8 of HRS rule)

**(2) Waste Characteristics:** Waste characteristics is evaluated based on toxicity and hazardous waste quantity.

Toxicity = 10,000 (PCBs, see a.(2) above)

Hazardous Waste Quantity = 100 (see a.(1) above)

Waste Characteristics Product =  $10,000 \times 100 = 1,000,000$

Waste Characteristics = 32 (Table 2-7 of HRS Rule)

**(3) Targets:** The only targets within the TDL are the residents living in the three houses across the street from the site. All residents of Westwood (population 4,500) live more than 1 mile travel distance from the site.

Nearby individual factor value = 1 (Table 5-9 of HRS rule)

Distance-weighted population values: (Table 5-10 of HRS rule)

Distance Category	Number of People	Distance-weighted Population Value
> 0 to 1/4 mile	14	0.4
TOTAL <sup>a/</sup>	---	0.4

<sup>a/</sup>values are zero for all other distance categories

Population within 1 mile factor value =  $0.4 \div 10 = 0.04$

Nearby Threat Targets = 1.04 ( $1 + 0.04$ )

**(4) Nearby Threat Score =  $(5 \times 32 \times 1.04) \div 82,500 = 0.002$  (rounds to 0)**

## e. Air Pathway

**(1) Likelihood of Release:** No air sampling was conducted, and no observed release by direct observation was established. Therefore, potential to release is evaluated.

Gas Potential to Release:

Source 1 (drums):

Gas Containment Factor Value = 10 (Table 6-3 of HRS rule)

Source Type Factor Value = 28 (Table 6-4 of HRS rule)

Gas Migration Potential = 17 (average of benzene, PCE, TCE; Table 6-7 of HRS Rule)

Gas Potential to Release =  $10 \times (28 + 17) = 450$

Source 2 (contaminated soil around drums):

Gas Containment Factor Value = 10 (Table 6-3 of HRS rule)

Source Type Factor Value = 19 (Table 6-4 of HRS rule)

Gas Migration Potential = 17 (average of benzene, PCE, TCE; Table 6-7 of HRS Rule)

Gas Potential to Release =  $10 \times (19 + 17) = 360$

**Gas Potential to Release = 450 (Source 1)**

Particulate Potential to Release:

Source 1 (drums):

Particulate Containment Factor Value = 10 (Table 6-9 of HRS rule)

Source Type Factor Value = 14 (Table 6-4 of HRS rule)

Particulate Migration Potential = 6 (Figure 6-2 of HRS Rule)

Particulate Potential to Release =  $10 \times (14 + 6) = 200$

Source 2 (contaminated soil around drums):

Particulate Containment Factor Value = 10 (Table 6-9 of HRS rule)

Source Type Factor Value = 22 (Table 6-4 of HRS rule)

Particulate Migration Potential = 6 (Figure 6-2 of HRS Rule)

Particulate Potential to Release =  $10 \times (22 + 6) = 280$

**Particulate Potential to Release = 280 (Source 2)**

Likelihood of Release = 450

**(2) Waste Characteristics:** No observed release is established, therefore mobility is based solely on contaminant characteristics.

Toxicity/Mobility = 100 (benzene, PCE; see a.(2) above)

Hazardous Waste Quantity = 100 (see a.(1) above)

Waste Characteristics Product =  $100 \times 100 = 10,000$

Waste Characteristics = 10 (Table 2-7 of HRS Rule)

**(3) Targets:** No observed release is established, therefore all targets are considered subject to potential contamination. The nearest individual is a resident located 800 feet from the nearest source. The entire population of Westwood (4,500) is between 5,400 and 9,900 feet from the nearest source. The wetland, located just offsite, is approximately 1.1 acres in size. No HRS resources are located within 1/2 mile of the site.

Nearest Individual factor value = 7 (Table 6-16 of HRS rule)

Distance-weighted population values: (Table 6-17 of HRS rule)

Distance Category	Number of People	Distance-weighted Population Value
0 to 1/4 mile	14	4
> 1 to 2 miles	4,500	27
TOTAL <sup>a/</sup>	---	31

<sup>a/</sup>values are zero for all other distance categories

Potential contamination factor value =  $31 \div 10 = 3.1$

Resources factor value = 0

Sensitive Environments factor value =  $2.5$  ( $25 \div 10$ )

Targets = 12.6 ( $7 + 3.1 + 0 + 2.5$ )

**(4) Air Pathway Score =  $(450 \times 10 \times 12.6) \div 82,500 = 0.71$**

## f. Site Score:

Ground Water Pathway = 5.64

Surface Water Pathway = 100

Soil Exposure Pathway = 0

Air Pathway = 0.71

**Site Score =**

$$\sqrt{\frac{(5.64)^2 + (100)^2 + (0)^2 + (0.71)^2}{4}} = 50.08$$

## g. Contaminant Characteristics

### Ground Water Pathway

Hazardous Substance	Toxicity	Mobility (Liquid)	Toxicity/Mobility
PCBs	10,000	0.0001	1
Benzene	100	1	100
Tetrachloroethane (PCE)	100	0.01	1
Trichloroethylene (TCE)	10	0.01	0.1

### Surface Water Pathway

Hazardous Substance	Drinking Water Threat			Human Food Chain Threat	
	Toxicity	Persistence (River)	Toxicity/Persistence	Bioaccumulation (Freshwater)	Toxicity/Persistence/Bioaccumulation
PCBs	10,000	1.0	10,000	50,000	500,000,000
Benzene	100	0.4	40	5,000	200,000
Tetrachloroethane (PCE)	100	0.4	40	50	2,000
Trichloroethylene (TCE)	10	0.4	4	50	200

Hazardous Substance	Environmental Threat		
	Ecotoxicity	Bioaccumulation (Freshwater)	Ecotoxicity/Persistence Bioaccumulation
PCBs	10,000	50,000	500,000,000
Benzene	10,000	500	200,000
Tetrachloroethane (PCE)	100	50	2,000
Trichloroethylene (TCE)	10	50	200

### Air Pathway

Hazardous Substance	Toxicity	Mobility	Gas	Particulate	Air Gas Migration	Toxicity/Mobility
PCBs	10,000	0.0002	No	Yes	0	2
Benzene	100	1.0	Yes	No	17	100
Tetrachloroethane (PCE)	100	1.0	Yes	No	17	100
Trichloroethylene (TCE)	10	1.0	Yes	No	17	10



# Appendix B: Reference Documents

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√ = Required reading

## 1. Superfund Documents

Ordering information: US EPA Headquarters and Regional staff should order documents through the Superfund Document Center (SDC) using control numbers. All others should order documents through the National Technical Information Services (NTIS) using the NTIS order numbers. Addresses and phone numbers for these centers are listed in Appendix C.

### a. Guidance Documents

- √ • ***Guidance for Performing Preliminary Assessments Under CERCLA***, September 1991 (EPA/540/G-91/013, Control No. 9345.0-01A, NTIS Order No. PB92-963303). This document provides instructions for conducting a PA and reporting results. It discusses the information required to evaluate a site, how to obtain it, and how to use it in scoring a site. This document also provides guidelines and instructions on PA evaluation, scoring, and the use of standard PA criteria lists and scoresheets. Its goal is to assist PA investigators in conducting high-quality assessments that result in correct site screening or further action recommendations on a nationally consistent basis.
- √ • ***Guidance for Performing Site Inspections Under CERCLA***, Interim Final, September 1992 (EPA/540/R-92/021, Control No. 9345.1-05, NTIS Order No. PB 92-963375). This document presents EPA's Site Inspection strategy. The strategy discusses procedural guidelines to investigate potential Superfund sites for evaluation pursuant to the HRS. It covers SI approaches and planning, sampling strategies, evaluation, and reporting requirements.
- √ • ***Hazard Ranking System (HRS) Guidance Manual***, Interim Final, November 1992 (EPA/540/R-92/026, Control No. 9345.1-07, NTIS Order No. PB 92-963377). This document provides general and technical guidance for individuals involved in determining HRS scores and preparing HRS scoring packages. It clarifies terms and concepts in the HRS rule, provides strategies and specific guidance for scoring selected HRS factors, and can assist in the collection and organization of relevant data and information.
- ***Community Relations in Superfund: A Handbook***, Section 4.1, January 1992 (Control No. 9230.0-03, NTIS Order No. PB 92-963341).
- ***Management of Investigation Derived Wastes During Site Inspections***, May 1991 (Control No. 9345.3-02, NTIS Order No. PB91-921331).

- √ • ***Guidance on Implementation of the Superfund Accelerated Cleanup Model (SACM) under CERCLA and the NCP***, July 7, 1992 (Control No. 9203.1-03).
- b. Fact Sheets and Bulletins**
- ***The Revised Hazard Ranking System: An Improved Tool for Screening Superfund Sites***, November 1990 (Control No. 9320.7-01FS, NTIS Order No. PB91-921307).
- ***The Revised Hazard Ranking System: Qs and As***, November 1990 (Control No. 9320.7-02FS, NTIS Order No. PB91-921305).
- ***The Revised Hazard Ranking System: Background Information***, November 1990 (Control No. 9320.7-03FS, NTIS Order No. PB91-921303).
- ***Closing the NPL Book Under the Original HRS***, November 1990 (Control No. 9320.7-04FS, NTIS Order No. PB91-921302).
- ***The Revised Hazard Ranking System: Evaluating Sites After Waste Removals***, October 1991 (Control No. 9345.1-03FS).
- ***Community Involvement During Site Assessment***, 1993 (Control No. 9345.4-02FS, NTIS Order No. to be determined, expected April 1993).
- ***Superfund Site Assessment – the Road to Cleanup (A Community Relations Fact Sheet)***, 1993, (Control No. 9345.4-03FS, NTIS Order No. to be determined, expected April 1993).
- ***Data Useability for Site Assessment***, work in progress – not published yet (Control No. 9345.1-06, NTIS Order No. To be determined).
- √ • ***The Superfund Accelerated Cleanup Model (SACM!)***, April 7, 1992 (Control No. 9203.1-01, NTIS Order No. PB92-963263).
- √ • Five SACM short sheets: ***Interim Guidance on Key SACM Program Management Issues, Early Action and Long Term Action Under SACM, Enforcement Under SACM, Assessing Sites Under SACM, and Regional Decision Teams***, December 1992 (Control No. 9203.1-05I, NTIS Order Nos. PB93-963262 – PB93-963266).
- ***Regional Pilots and Applications of the SACM***, June 1992 (Control No. 9202.1-03FS, NTIS Order No. PB92-963273).
- ***Superfund Accelerated Cleanup Bulletin: Presumptive Remedies for Municipal Landfill Sites***, Volume 1, Number 1, May 1992 (Control No. 9203.1-02I, NTIS Order No. PB92-963367).
- ***Superfund Accelerated Cleanup Bulletin: Presumptive Remedies for Wood Treatment Facilities***, Volume 1, Number 2, May 1992 (Control No. 9203.1-02I, NTIS Order No. PB92-963361).



- **Superfund Accelerated Cleanup Bulletin: Presumptive Remedies**, Volume 1, Number 3, August 1992 (Control No. 9203.1-021, NTIS Order No. PB92-963371).
- **Superfund Removal Procedures Manual Bulletin**, July 1991 (Control No. 9360.3-111).

## 2. Laws and Regulations

- **Hazard Ranking System** (*Federal Register*, December 14, 1990 or 40 *CFR* 300, Appendix A, Stock #869-017-00148-1). Ordering information: *Federal Register* publications are available from the Superfund Document Center and copies of the *Code of Federal Regulations* can be purchased from the Government Printing Office; addresses and phone numbers are listed in Appendix C.
- **National Contingency Plan** (*Federal Register*, March 8, 1990, or 40 *CFR* 300, Stock #869-017-00148-1). Ordering information: *Federal Register* publications are available from the Superfund Document Center and copies of the *Code of Federal Regulations* can be purchased from the Government Printing Office; addresses and phone number are listed in Appendix C.
- **CERCLA** (Public Law 96-510) and **SARA** (Public Law 99-499).  
Ordering information: Copies of public laws can be purchased from the Government Printing Office's *Statutes at Large* publication; address and phone number is listed in Appendix C.

Some selected citations of CERCLA, as amended by SARA:

§101 Contains definitions of terms.

§104(e) Specifies procedures for gathering information and obtaining site access.

§105(a) Requires establishing the National Contingency Plan (NCP) and criteria for setting priorities for site selection; EPA developed the HRS to establish these criteria (the HRS is Appendix A to the NCP).

§105(d) Specifies that EPA must conduct a preliminary assessment of the hazards associated with releases or threatened releases.

§120 Covers the application of the Act to Federal facilities and establishes the Federal Agency Hazardous Waste Compliance Docket.

## 3. Supplementary and Background Materials

- Supplementary Materials: **National Priorities List**, **Background Information: National Priorities List**, and **Descriptions of Sites Proposed or Finalized on the National Priorities List** (Control No. Series 9320.7). Ordering information: Contact the US EPA Public Information Center, listed in Appendix C.

Ordering information for the remaining documents: US EPA Headquarters and Regional staff should order documents through the Superfund Document Center (SDC) using control numbers. All others should order documents through the National Technical Information Services (NTIS)

using the NTIS order numbers. Addresses and phone numbers for these centers are listed in Appendix C.

- **National Priorities List Sites**, Volume for each State and a national overview volume: **Superfund: Focusing on the Nation at Large**, September 1990 (Control No. 9200.5-700 series, NTIS Order No. PB91-921209 series).
- **Superfund CERCLIS Characterization Project**, Volume for each State and national results, November 1991 (Control No. 9345.1-10-0 series, NTIS Order No. PB92-963315 series).
- **Superfund NPL Characterization Project**, Volume for each State and national results, November 1991 (Control No. 9345.1-09-0 series, NTIS Order No. PB92-963304 series).

# Appendix C: List of Contacts

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## 1. Information on Site Assessment Screening Video

For information on the Superfund Site Assessment Video or to obtain materials that accompany the video, contact:

US EPA Site Assessment Branch  
Mail Code: OS-5204G  
401 M Street, S.W.  
Washington, DC 20460  
(703) 603-8845

## 2. EPA Regional NPL Coordinators/Site Assessment Managers

		<u>DDD</u>	<u>FTS</u>
Region 1	Nancy Smith	(617) 573-9697	573-9697
Region 2	Ben Conetta	(212) 264-6696	264-6696
Region 3	Margret Jennis	(215) 597-8229	597-8229
Region 4	Deborah Vaughn-Wright	(404) 347-5065	347-5065
Region 5	Bill Messenger	(312) 353-1057	353-1057
Region 6	Bart Canellas	(214) 655-6740	655-6740
Region 7	Susan Lackey	(913) 551-7062	551-7062
Region 8	Greg Oberley	(303) 294-7598	294-7598
Region 9	Lisa Nelson	(415) 744-2347	744-2347
Region 10	David Bennett	(206) 553-2103	553-2103

## 3. Superfund Document Center (to order a document using the EPA control number or copies of the *Federal Register*)

401 M Street, S.W. OS-245  
Washington, D.C. 20460  
(202) 260-9760

## 4. National Technical Information Service (to order a document using the NTIS order number)

US Department of Commerce  
5285 Port Royal Road  
Springfield, VA 22161  
(703) 487-4600 or (800) 336-4700

**5. EPA Public Information Center** (to order supplemental materials)

401 M Street, S.W., PM-211B  
Washington, DC 20460  
(202) 260-2080

**6. Government Printing Office** (to order public laws or copies of the *Code of Federal Regulations*)

Superintendent of Documents  
US Government Printing Office  
Washington, DC 20402-9325  
(202) 783-3238

# Appendix D: Other Tools

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## 1. Computer Tools

- ***PA-Score Software: User's Manual and Tutorial:*** Version 1.0, September 1991 (Control No. 9345.1-11, NTIS Order No. PB92-500032).
- ***PREscore Software and User's Manual:*** Version 1.1, July 1992 (Control No. 9345.1-04, NTIS Order No. To be Determined).

Ordering information: US EPA Headquarters and Regional staff should order documents through the Superfund Document Center (SDC) using control numbers. All others should order documents through the National Technical Information Services (NTIS) using the NTIS order numbers. Addresses and phone numbers for these centers are listed in Appendix C.

## 2. Hotline Numbers

- RCRA/Superfund/UST Hotline: (800) 424-9346  
(703) 412-9810 (Northern Virginia)  
(800) 553-7672 (TDD)
- National Response Center: (800) 424-8802 (serviced 24 hours a day)

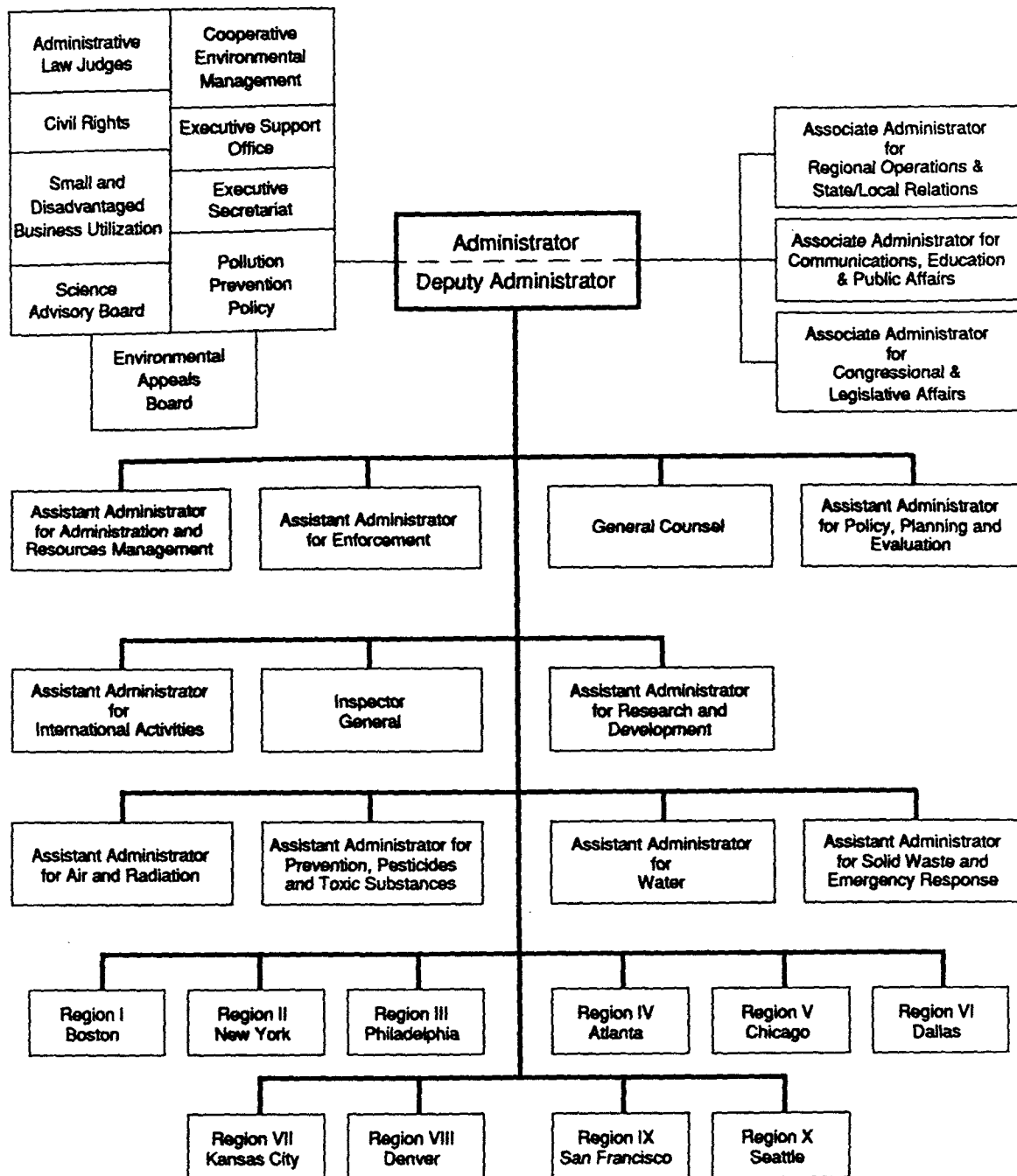
The National Response Center is operated by the US Coast Guard and receives and evaluates reports of oil and hazardous substance releases into the environment. The Center notifies the appropriate agencies.

## 3. ***Site Assessment Information Directory (SAID) Regions I-X***

(hard copy and disk distributed to Regions), October 1991. This comprehensive directory gives the appropriate organizations to contact to obtain site information on a variety of issues. Organizations include federal, regional, state, and local government offices and business contacts, such as private labs, associations, and investigators. The electronic version can focus organizational searches by specific topic areas (e.g., population, air quality, location, land use, agriculture, soil, and a number of other areas).

Ordering information: Contact the NPL Coordinator in your Region, as listed in Appendix C.

## 4. EPA Organizational Chart



# Appendix E:

## Glossary of Terms and Acronyms Related to Superfund Site Assessment

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**AA** (Assistant Administrator): Assistant Administrator for the Office of Solid Waste and Emergency Response (OSWER).

**ANPRM** (Advance Notice of Proposed Rulemaking): An announcement appearing in the Federal Register that notifies the public of EPA's intent to publish a specific proposed rule.

**AOC** (Area of Contamination): A continuous (significant) extent of contamination at a Superfund site.

**ARARs** (Applicable or Relevant and Appropriate Requirements): Those cleanup standards, standards of control, and other substantive environmental protection requirements, criteria, or limitations promulgated under Federal or State law that specifically address a hazardous substance, pollutant, contaminant, remedial action, location, or other circumstance at a CERCLA site, or that address problems or situations sufficiently similar to those encountered at the CERCLA site that their use is well-suited to the particular site.

**ATSDR** (Agency for Toxic Substances & Disease Registry): An Agency within the Department of Health and Human Services that conducts health assessments at Superfund sites.

**Background Level:** Non-site-related levels of chemicals in the environment. Background levels of chemicals can be either naturally occurring (i.e., ambient concentrations of chemicals that have not been influenced by humans) or anthropogenic (i.e., concentrations of chemicals that are present due to human-made, non-site sources, such as other industries).

**CDC** (Centers for Disease Control): An operating health agency within the Public Health Service of the U.S. Department of Health and Human Services that develops and implements programs to deal with environmental health problems, including responding to environmental, chemical, and radiation emergencies.

**CEPP** (Chemical Emergency Preparedness Program): As part of EPA's Air Toxics Strategy, provides guidance, training, and technical assistance to States and local communities to help them in preparing for and responding to chemical accidents.

**CERCLA** (Comprehensive Environmental Response, Compensation, and Liability Act): A Federal law passed in 1980 and modified in 1986 by the Superfund Amendments and Reauthorization Act. The Acts created a special tax that goes into a Trust Fund, commonly known as Superfund, to investigate and clean up abandoned or uncontrolled hazardous waste sites. Under the program, EPA can either pay for site cleanup when parties responsible for the contamination cannot be located or are unwilling or unable to perform the work; or take legal action to force parties responsible for site contamination to clean up the site or pay back the Federal government for the cost of the cleanup.

**CERCLIS** (Comprehensive Environmental Response, Compensation, and Liability Information System): EPA's comprehensive data base and management system that inventories and tracks releases addressed or needing to be addressed by the Superfund program.

**CFR** (Code of Federal Regulations): All Federal regulations in force are published annually in codified form in the Code of Federal Regulations.

**CLP** (Contract Lab Program): Laboratories under contract to EPA that analyze soil, water, and waste samples taken from areas at or near Superfund sites.

**CWA** (Clean Water Act): A statute under which EPA promulgates Water Quality Criteria and administers the National Pollutant Discharge Elimination System (NPDES) permit program, as well as regulates discharges to or dredging of wetlands.

**ERCS** (Emergency Response Cleanup Services): Contracts that provide the technical assistance and cleanup service that EPA needs to implement an effective removal program.

**ERNS** (Emergency Response Notification System): A central data base that provides EPA with a more comprehensive perspective on release notifications nationwide.

**ERT** (Environmental Response Team): EPA hazardous waste experts who provide 24-hour technical assistance to EPA Regional offices and States during all types of emergencies involving releases at hazardous waste sites and spills of hazardous substances.

**ESAT** (Environmental Services Assistance Teams): Provide laboratory, analytical, and review services to all areas of the Superfund program.

**Factor Categories:** Three categories used to assess risk from HRS pathways: (1) Likelihood of Release (LR); (2) Waste Characteristics (WC); and (3) Targets (T).

**FIT** (Field Investigation Team): Provides support for site assessment activities.

**FR** (Federal Register): Each Federal working day, publishes current Presidential proclamations and Executive Orders, Federal agency regulations having general applicability and legal effect, proposed agency rules, and documents that are required by statute to be published.

**FS** (Feasibility Study): A study to develop and evaluate options for remedial action. The feasibility study emphasizes data analysis and is generally performed concurrently and in an interactive fashion with the remedial investigation.

**FY** (Fiscal Year): For the U.S. government, begins on October 1 and ends on September 30. For example, FY88 begins on October 1, 1987 and ends on September 30, 1988.

**Hazardous Substance:** Section 101(14) of CERCLA, as amended, defines "hazardous substance" chiefly by reference to other environmental statutes, such as the Solid Waste Disposal Act, Federal Water Pollution Control Act, Clean Air Act, and Toxic Substances Control Act. The term does not include petroleum, crude oil or any fraction thereof, natural gas, natural gas liquids, or synthetic gas usable for fuel.

**HRS** (Hazard Ranking System): A scoring system used to evaluate potential relative risks to public health and the environment from releases or threatened releases of hazardous substances. EPA and States use the HRS to calculate a site score, from 0 to 100, based on the actual or potential release of hazardous substances from a site to affect people or the environment through air, surface water, or ground water. This score is the primary factor used to determine if a hazardous waste site is eligible to be placed on the National Priorities List (NPL).



**IDW** (Investigation Derived Wastes): Wastes generated during the process of collecting samples during CERCLA investigations which must be handled according to all applicable or relevant and appropriate requirements.

**LR** (Likelihood of Release): Factor category used to assess the likelihood that a hazardous substance will be released to the environment.

**LTRA** (Long Term Response Actions): Actions such as ground water pump and treat operations that require extensive timeframes to achieve remedial cleanup objectives.

**MCLs** (Maximum Contaminant Levels): Under the Safe Drinking Water Act, the maximum permissible level of a contaminant in water which is delivered to any user of a public water system.

**MCLG** (Maximum Contaminant Level Goals): Non-enforceable goals established under the Safe Drinking Water Act for drinking water that consider only health-based factors.

**NCP** (National Oil and Hazardous Substances Pollution Contingency Plan): The Federal regulation (40 CFR 300) that guides the Superfund program. The NCP established the Hazard Ranking System as the principal mechanism for placing sites on the National Priorities List.

**NFRAP** (No Further Remedial Action Planned): No response planned under the remedial authority of Superfund, not that no response is planned. This designation has been replaced by SEA – Site Evaluation Accomplished.

**NPL** (National Priorities List): EPA's list of the most serious uncontrolled or abandoned hazardous waste sites identified for possible long term remedial response using Federal dollars. The list is based primarily on the score a site receives on the Hazard Ranking System (HRS). EPA is required to update the NPL at least once a year.

**NPRM** (Notice of Proposed Rulemaking): A document published in the Federal Register that sets forth proposed regulatory language, provides notice of issues to be commented on, and presents other supplementary and background information about the rulemaking.

**NRC** (National Response Center): The center operated by the U.S. Coast Guard that receives and evaluates reports of oil and hazardous substance releases into the environment and notifies the appropriate agency(s). The NRC can be contacted 24-hours a day, toll-free at (800) 424-8802.

**NRT** (National Response Team): Representatives of 12 Federal agencies that coordinate Federal responses to nationally significant pollution incidents and provide advice and technical assistance to the responding agency(s).

**NSF** (National Strike Force): Consists of the Strike Teams established by the U.S. Coast Guard on the Pacific and Gulf Coasts. These teams can provide a variety of response support services including communications, technical advice and assistance, specialized equipment, training, and contingency planning.

**O&M** (Operation and Maintenance): Activities conducted at a site after a response action occurs, to ensure that the cleanup or containment system is functioning properly.

**Observed Release:** The evaluation of a release of a hazardous substance to the environment based on analytical data of the migration pathway or direct observation of the release into the migration pathway media.

**OHMTADS** (Oil and Hazardous Material Technical Assistance Data System): An automated informational repository data base containing 126 fields of information on physical, chemical, biological, toxicological, and

commercial data on approximately 1400 oil and hazardous materials that are potentially harmful to human health and welfare and/or the environment.

**OSC (On-Scene Coordinator):** The Federal official who coordinates and directs Superfund removal actions.

**PA (Preliminary Assessment):** The process of collecting and reviewing available information about a known or suspected hazardous waste site or release. EPA or States use this information to determine if the site requires further study. If further study is needed, a Site Inspection (SI) is undertaken.

**Pathway (also Exposure Pathway):** The environmental medium through which a hazardous substances may threaten humans and the environment. Risks are transmitted to targets via exposure pathways. These pathways include ground water, surface water, soil, and air.

**Pathway Score:**  $S_x = \frac{LR \times WC \times T}{82,500}$  Computes a score for each pathway using information on the Likelihood of

Release (LR), Waste Characteristics (WC), and Targets (T). 82,500 is based on a score of 150 for T, with LR and WC receiving a maximum pathway score of 100.

**PIAT (Public Information Assist Team):** A U.S. Coast Guard organization available through the NRC to assist On-Scene Coordinators (OSCs) and Regional offices in meeting demands for public information and participation.

**Primary Target:** At the Preliminary Assessment, those targets suspected of being exposed to hazardous substances.

**PREscore:** A computer program that automates site scoring with the HRS.

**PRP (Potentially Responsible Party):** Any individual or company (such as an owner, operator, transporter, or generator) potentially responsible for, or contributing to, the contamination problems at a Superfund site. Whenever possible, EPA requires PRPs, through administrative and legal actions, to clean up sites contaminated by hazardous substances.

**QA/QC (Quality Assurance/Quality Control):** A system of procedures, checks, audits, and corrective actions used to ensure that field work and laboratory analysis during the investigation and cleanup of Superfund sites meet established standards.

**RA (Remedial Action):** The actual construction or implementation phase that follows the remedial design of the selected cleanup alternative at a site on the National Priorities List (NPL).

**RAC (Response Action Contractor):** Any person who agrees, by contract, to provide a removal or remedial action at a facility listed on the NPL, or to provide evaluation, planning, engineering, surveying and mapping, design, construction, equipment, or any ancillary services related to a removal or remedial action.

**RCRA (Resource Conservation and Recovery Act of 1976):** A Federal law that established a regulatory system to track hazardous wastes from the time of generation to disposal. The law requires safe and secure procedures to be used in treating, transporting, storing, and disposing of hazardous substances. RCRA is designed to prevent new, uncontrolled hazardous waste sites.

**RD (Remedial Design):** An engineering phase that follows the Record of Decision (ROD) when technical drawings and specifications are developed for the subsequent remedial action (RA) at a site on the National Priorities List (NPL).

**Remedial Response:** A long term action that stops or substantially reduces a release or threatened release of hazardous substances that is serious, but does not pose an immediate threat to public health and/or the environment.

**Removal Action:** An immediate action taken over the short term to address a release or threatened release of hazardous substances.

**Response Action:** A CERCLA-authorized action at a Superfund site involving either a short term removal action or a long term remedial response.

**RI (Remedial Investigation):** A process to determine the nature and extent of the problem presented at a Superfund site. The remedial investigation emphasizes data collection and site characterization, and is generally performed concurrently and in an interactive fashion with the feasibility study (FS).

**Risk Assessment:** An evaluation performed as part of the remedial investigation to assess baseline conditions at a Superfund site and determine the risk posed to public health and/or the environment.

**ROD (Record of Decision):** A public document that explains which cleanup alternative(s) will be used at National Priorities List (NPL) sites where Federal funds pay for the cleanup.

**RP (Responsible Party):** A party that admits to or that EPA or the Department of Justice prove was responsible for contamination at a Superfund site.

**RPM (Remedial Project Manager):** The official designated by the lead agency to coordinate, monitor, or direct remedial or other response activities.

**RQs (Reportable Quantities):** Established under CERCLA section 102 as triggers for notification to the Federal government when hazardous substances are released. The release of a hazardous substance that equals or exceeds its RQ must be reported immediately to the National Response Center (NRC).

**RRC (Regional Response Center):** Provides facilities and personnel for communications, information storage, and other requirements for coordinating response.

**RRT (Regional Response Team):** Representatives of Federal, State, and local agencies who may assist in coordination of activities at the request of the On-Scene Coordinator (OSC) or Remedial Project Manager (RPM) before and during response actions.

**SACM (Superfund Accelerated Cleanup Model):** The model for streamlining and accelerating the Superfund program, proposed in April 1992. It combines the emergency response (removal) and remedial components of the program and all site assessment will take place in one program. After a one-step site screening and risk assessment, a Regional Decision Team will institute short term activities that address all threats to the health and safety of the existing population. These short term activities will be published in the Federal Register (for public information purposes only, not as a rulemaking) on an Early Action List. The Regional Decision Team will also determine if and when long term remediation (e.g., ground water restoration) is appropriate. Sites would then be placed on the Long Term Remediation List and be cleaned up over many years.

**SARA** (Superfund Amendments and Reauthorization Act): Modifications to CERCLA enacted on October 17, 1986.

**SEA** (Site Evaluation Accomplished): No further response under the authority of Superfund is necessary.

**Secondary Target:** At the Preliminary Assessment, those targets not suspected of being exposed to hazardous substances.

**Sensitive Environment:** A terrestrial or aquatic resource, fragile natural setting, or other area with unique or highly-valued environmental or cultural features.

**SERA** (Superfund Emergency Response Actions): A two-volume compilation of Fund-financed removal descriptions. Each description provides basic facts about the site, the nature of the problem, and mitigative actions taken.

**SI** (Site Inspection): A technical phase of site assessment that follows a Preliminary Assessment (PA), designed to collect more extensive information on a hazardous waste site. The information is used to score the site with the Hazard Ranking System (HRS) to determine whether further response action under CERCLA is needed.

**Site Score**  $\sqrt{\frac{(S_{GW})^2 + (S_{SW})^2 + (S_S)^2 + (S_A)^2}{4}}$  Using this root mean square equation, a score is computed

for a site using the data of the pathway scores – ground water pathway ( $S_{GW}$ ), surface water pathway ( $S_{SW}$ ), soil exposure pathway ( $S_S$ ), and air pathway ( $S_A$ ).

**SMOA** (Superfund Memorandum of Agreement): A written document executed by an EPA Regional Administrator and the head of a State agency establishing the nature and extent of EPA and State interaction during the pre-remedial, remedial, and enforcement response process.

**Source:** Any area where a hazardous substance has been deposited, stored, disposed, or placed, plus those soils that have become contaminated through migration of a hazardous substance. Air, water, or sediments that are contaminated are not considered sources, except in certain special cases applicable only to ground water and surface water sediments.

**SOW** (Statement of Work): A document that specifies the scope of work and procedures that will be used to undertake a discrete step of a Superfund investigation or action.

**Superfund:** The common name used for the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), also referred to as the Trust Fund.

**T** (Targets): Physical human or environmental resources that are threatened (or potentially threatened) by a release (or potential release) of hazardous substances from a site; HRS targets include human populations using ground or surface water for drinking water; populations residing, working, or attending school within four miles of the site; fisheries; land and water used for commercial agriculture, food preparation, or other resource uses; and sensitive environments.

**TAGs** (Technical Assistance Grants): Designed to provide funds to communities for the purpose of hiring advisors to interpret technical information related to cleanup of Superfund sites listed on the NPL.

**TAT** (Technical Assistance Team): Provides initial site response support, determinations of the size and nature of the site, and support for OSCs during actual cleanup.

**TDL** (Target Distance Limit): Maximum distance over which targets for the site are evaluated. The target distance limit varies by HRS pathway.

**TES** (Technical Enforcement Services): Contracts that provide EPA Headquarters or Regions with assistance during enforcement-related activities, such as PRP searches or oversight of PRP-conducted investigations or actions.

**Threats:** Three components of the surface water pathway: (1) drinking water threat (DWT); (2) human food chain threat (HFCT); and (3) environmental threat (ET).

**Tier:** The HRS has four methods for evaluating hazardous waste quantity: (1) hazardous constituent; (2) hazardous wastestream quantity; (3) volume; and (4) area.

**TSCA** (Toxic Substances Control Act): Provides authorities to control the manufacture and sale of certain chemical substances, including polychlorinated biphenyls (PCBs).

**TSDF** (Treatment, Storage, and Disposal Facility): A facility regulated under RCRA that manages RCRA hazardous wastes in one of the ways mentioned.

**USCG** (U.S. Coast Guard): An agency in the U.S. Department of Transportation that is the predesignated On-Scene Coordinator (OSC) in the Coastal Zone and has the authority under CERCLA to respond to any release or threatened release of hazardous substances involving the Coastal Zone, Great Lakes waters, ports, and harbors. The USCG shares with EPA responsibility for the emergency response activities under the NCP.

**WC** (Waste Characteristics): Factor category used to assess the properties of hazardous substances and how much is available to migrate.

# Site Assessment Branch Training Curriculum for 1993

	<u>Date</u>	<u>Location</u>	<u>Open to</u>
<b>HRS Training Course</b>			
Session 2:	March 2-5	Cincinnati, OH	Regions: 5-10
Session 3:	April 20-23	Edison, NJ	Regions: 1-4
Session 4:	May 18-21	Cincinnati, OH	Regions: 5-10
Session 5:	July 13-16	Denver, CO	Regions: 1-10
<b>PA&amp;SI Training Course</b>			
Session 1:	March 16-18	Cincinnati, NJ	Regions: 5-10
Session 2:	April 6-8	Edison, NJ	Regions: 1-4
Session 3:	May 4-6	Edison, NJ	Regions: 1-4
Session 4:	May 25-27	Cincinnati, OH	Regions: 5-10
Session 5:	August 10-12	Denver, CO	Regions: 1-10
<b>HRS Documentation Record Workshop</b>			
Session 1:	June	Washington, DC	Regions: 1-4
Session 2:	July	San Francisco, CA	Regions: 8-10
Session 3:	August 9-13	Cincinnati, OH	Regions: 5-7
<b>Federal Facilities Training Course</b>			
Session 3:	March 9-11	Seattle, WA	

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\* Sessions 1-4 will be half the size of Session 5 because of the training facilities.

## Ordering Information

*Site Assessment Screening: A National Priority* was produced by the Environmental Media Center under a grant from the U.S. Environmental Protection Agency's (EPA) Office of Emergency and Remedial Response.

Copies of the video and guide have been distributed to all U.S. EPA Regional site assessment programs, U.S. EPA Regional libraries, State site assessment programs, and other federal agencies.

To order additional copies of the video:

Call toll free (800) 522-0362 or (301) 229-1944 or send \$80.00 (prepaid) to:

Environmental Media Center  
P.O. Box 30212  
Bethesda, MD 20814

To order additional copies of this guide (control or publication number 9345.1-14):

Call the National Technical Information Service (NTIS) toll free (800) 553-6847 or (703) 487-4600.