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MEMORANDUM

SUBJECT: Guidance on Oversight of Potentially Responsible Party Remedial Investigations and Feasibility Studies

FROM: Bruce Diamond, Director
Office of Waste Programs Enforcement

TO: Directors, Waste Management Division,
Regions I, IV, V, VII, VIII

Director, Emergency & Remedial Response Division,
Region II

Directors, Hazardous Waste Management Division,
Regions III, VI, IX

Director, Hazardous Waste Division,
Region X

Directors, Environmental Services Division,
Regions I, II, III, IV, VI, VII, VIII, IX, X

Director, Environmental Sciences Division
Region V

The purpose of this memorandum is to transmit to you the "Guidance on Oversight of Potentially Responsible Party Remedial Investigations and Feasibility Studies (RI/FS)", Volume 1, OSWER Directive No. 9835.1(c) and a companion document, Volume 2, which describes the oversight of sampling and analysis activities and of well drilling and installation activities, OSWER Directive No. 9835.1(d). These documents are in response to the 90-day Study recommendation that EPA strengthen its efforts to effectively oversee private party RI/FSs.

These guidance documents are intended to assist Regional Project Managers (RPMs) in providing and maintaining quality oversight of the remedial activities performed by potentially responsible parties (PRPs) during Enforcement-lead Remedial Investigations and Feasibility Studies (RI/FSs). The information presented here was developed, in part, through a series of visits with experienced RPMs and Regional managers. A draft of these guidance documents, dated October 18, 1990, was sent to all Regions and other Offices within Headquarters for review and comment. The Regional and Headquarters comments and suggestions have been addressed and changes incorporated into these guidances. Additional copies of these guidances will be available from CERI at the end of the third quarter of FY91.

Overall, this guidance focuses on how the RPM should oversee or perform remedial activities throughout the RI/FS process. Good oversight during the RI/FS depends on the RPM's ability to effectively and efficiently perform the following:

* consider and act in accordance with the goals, objectives, and expectations in the NCP and in other appropriate guidance documents early in the planning phase with PRPs;

* identify and access available technical expertise, both Regional and external sources, early in the process;

* communicate with the oversight assistant, technical support team, States, Natural Resource Trustees, and the community early and often;

* keep Regional management informed of major PRP activities and deliverables at specific stages throughout the process;

* set up a reasonable schedule for PRPs to perform activities and submit deliverables in a timely manner;

* keep Regional review of PRP deliverables on schedule;

* ensure that the PRP activities satisfy Regional standard operating procedures; and

* verify that the data and procedures satisfy Regional QA/QC requirements.

Each of these items is addressed, in detail, throughout the guidance documents. EPA's recent policy of not entering into an AOC (dated after June 21, 1990) under which a PRP performs the risk assessment component of the RI/FS is also discussed here.

This document supplements existing RI/FS guidance including:

* Guidance for Conducting Remedial Investigations and Feasibility Studies under CERCLA, OSWER Directive No. 9355.3-01, October 1988;

* Enforcement Project Management Handbook, OSWER Directive No. 9837.2-A, January 1991;

* Interim Guidance on Potentially Responsible Party Participation, OSWER Directive No. 9340.1-01, March 1984, May 1988, and October 1988;

* Model Statement of Work for a Remedial Investigation and Feasibility Study Conducted by Potentially Responsible Parties, OSWER Directive No. 9835.8, June 1989; and

* Administrative Order on Consent for CERCLA Remedial Investigation/Feasibility Study, OSWER Directive No. 9835.3-1A, January 1990.

In addition to distributing the oversight guidances, staff from OWPE's Guidance and Evaluation Branch will be conducting a PRP RI/FS Oversight Training program for all interested Regional staff at locations in Regions I, II, IV, V, VII, and X in the third quarter of FY91.

Thank you for your Region's cooperation and assistance in developing the attached guidances. These guidances, the NCP, and other relevant RI/FS guidance documents are valuable tools that each Region can use to improve the quality of enforcement RI/FSs. If you should have any questions on these guidances or the training program, please contact OWPE's Matthew Charsky (FTS 475-9805).

cc: Bill White, OE
Tim Fields, OERR
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Regional Superfund Branch Chiefs

Directive No. 9835.1 (c)

GUIDANCE ON OVERSIGHT OF POTENTIALLY RESPONSIBLE PARTY REMEDIAL INVESTIGATIONS AND FEASIBILITY STUDIES

Final

U.S. Environmental Protection Agency
Office of Waste Programs Enforcement
Washington, D.C. 20460

VOLUME 1

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This document was developed by the Guidance and Evaluation Branch of the CERCLA Enforcement Division in EPA's Office of Waste Programs Enforcement. Matthew Charsky served as EPA's Project Coordinator. The project was directed by Sally Mansbach, Acting Director CERCLA Enforcement Division, with the assistance of Arthur Weissman, Guidance and Evaluation Branch Chief. This handbook was produced by PRC Environmental Management, Inc., under EPA Contract No. 68-01-7331. Paul Dean served as Project Manager for PRC Environmental Management, Inc.

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NOTICE

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LIST OF ACRONYMS

AA	Assistant Administrator
AD	Air Division
AERIS	Aid for Evaluating the Redevelopment of Industrial Sites
AOC	Administrative Order on Consent
ARARs	Applicable or relevant and appropriate requirements
ARCS	Alternative Remedial Contract Strategy
ATSDR	Agency for Toxic Substances and Disease Registry
ATTIC	Alternate Treatment Technology Information Center
BBS	Bulletin Board System
BTAG	Biological Technical Assistance Group
CA	Cooperative Agreement
CD	Consent Decree
CDC	Center for Disease Control
CEAM	Center for Exposure Assessment Modeling
CEPP	Chemical Emergency Preparedness Program
CERCLA	Comprehensive Environmental Response, Compensation and Liability Act
CERCLIS	Comprehensive Environmental Response, Compensation and Liability Information System
CLP	Contract laboratory program
COLIS	Computerized On-Line Information Systems
CORA	Cost of Remedial Action
CRP	Community relations plan
DOC	Department of Commerce
DOD	Department of Defense
DOE	Department of Energy
DOI	Department of the Interior
DOJ	Department of Justice
DOL	Department of Labor
DOT	Department of Transportation
DQO	Data quality objectives
EA	Ecological/environmental assessment
ECAO	Environmental Criteria and Assessment Office
EECA	Engineering Evaluation and Cost Analysis
EEM	Environmental Evaluation Manual
EIS	Environmental impact statement
E-MAIL	Electronic mail system
EMSL	Environmental Monitoring System Laboratory
EPA or "the Agency"	U.S. Environmental Protection Agency
ERCS	Emergency Response Contracting Strategy
ERIS	Expert Resources Inventory System
ERL	Environmental Research Laboratory
ERT	Environmental Response Team
ESD	Environmental Services Division
EST	Eastern Standard Time
FEMA	Federal Emergency Management Agency
FIT	Field Investigation Team
FFA	Federal facility agreement
FMO	Financial management office
FSP	Field sampling plan
HSCD	Hazardous Site Control Division
HEAST	Health Effects Assessment Summary Tables

LIST OF ACRONYMS
(continued)

HHEM	Human Health Evaluation Manual
HHS	Health and Human Services
HRS	Hazard Ranking System
HSP	Health and safety plan
HWCD	Hazardous Waste Collection Database
IAG	Interagency agreement
IFMS	Information Management Systems
IMC	Information Management Coordinator
IRIS	Integrated Risk Information System
LDR	Land Disposal Restriction
MCL	Maximum contaminant level
MCLG	Maximum contaminant level goal
NCC	National Computer Center
NCP	National Contingency Plan
NEIC	National Enforcement Investigations Center
NOAA	National Oceanic & Atmospheric Administration
NPDES	National pollutant discharge elimination system
NPL	National Priorities List
NPTN	National Pesticides Telecommunications Network
NRC	Nuclear Regulatory Commission
OE	Office of Enforcement
O&M	Operation and maintenance
OECM	Office of Enforcement and Compliance Monitoring
OERR	Office of Emergency and Remedial Response
OFFE	Office of Federal Facilities Enforcement
OGC	Office of General Counsel
OHEA	Office of Health and Environmental Assessment
ORC	Office of Regional Counsel
ORD	Office of Research and Development
OSHA	Occupational Safety and Health Administration
OSWER	Office of Solid Waste and Emergency Response
OWPE	Office of Waste Programs Enforcement
PA	Preliminary assessment
PC	Personal computer
PRGs	Preliminary remediation goals
PRP	Potentially responsible party
PWS	Public Water Supply
QA/QC	Quality assurance/quality control
QAPjP	Quality Assurance Project Plan
RAGS	Risk Assessment Guidance for Superfund
RAS	Routine analytical sampling
RCRA	Resource Conservation and Recovery Act
RD/RA	Remedial design/remedial action
REM	Remedial Engineering Management
RFD	Reference dosage
RI/FS	Remedial investigation/feasibility study
RME	Reasonable maximum exposure
ROD	Record of decision
RPM	Remedial Project Manager
RREL	Risk Reduction Engineering Laboratory
RSKERL	Robert S. Kerr Environmental Research Laboratory
SAP	Sampling and analysis plan
SAS	Special analytical sampling

LIST OF ACRONYMS
(continued)

SCAP	Superfund Comprehensive Action Plan
SCEES	Site Cost Estimate and Evaluation Study
SEAM	Superfund Exposure Assessment Manual
SFWS	State Fish and Wildlife Service
SGS	State Geological Survey
SHPO	State Historic Preservation Office
SI	Site inspection
SIF	Site Information Form (CERCLIS)
SITE	Superfund Innovative Technology Evaluation Program
SMOA	Superfund Memorandum of Agreement
SNL	Special notice letter
SOP	Standard operating procedures
SOW	Statement of Work
SPO	State Project Officer
SRI	Superfund Remediation Information
START	Superfund Technical Assistance Response Team
TAP	Treatability Assistance Program
TAT	Technical Assistance Team
TSCA	Toxic Substances Control Act
TES	Technical Enforcement Support
TIX	Technical Information Exchange
TRIS	Toxic Release Inventory System
TS	Treatability Study
TST	Technical Support Team
UAO	Unilateral Administrative Order
UIC	Underground Injection Control
USCOE	U.S. Army Corps of Engineers
USDA	United States Department of Agriculture
USFWS	United States Fish and Wildlife Service
USGS	United States Geological Service
WD	Water Division
WMD	Waste Management Division
WP	Work Plan

CHAPTER 1

OVERSIGHT ROLES AND RESPONSIBILITIES

INTRODUCTION

Purpose

Volume 1 of this document addresses oversight of remedial investigations and feasibility studies (RI/FSs) conducted by potentially responsible parties (PRPs) at enforcement-lead sites addressed under the Comprehensive Environmental Response, Compensation and Liability Act, as amended (CERCLA). It parallels activities described in the "Guidance for Conducting Remedial Investigations and Feasibility Studies Under CERCLA" (OSWER Directive No. 9355.3-01, October, 1988, referred to here as the "RI/FS Guidance") and the "Model Statement of Work for a Remedial Investigation and Feasibility Study Conducted by Potentially Responsible Parties" (OSWER Directive No. 9835.8, June 2, 1989, referred to here as the "Model SOW for PRP-lead RI/FSs"). It provides project managers with the procedures required to organize and perform appropriate oversight duties and responsibilities. This document is guidance only; it is not a binding set of requirements and does not create rights for any party.

Volume 2 describes the oversight of sampling and analysis activities (Appendix B1) and of well drilling installation activity (Appendix C1) conducted during a PRP RI. Checklists to assist in the documentation of sampling and analysis activities and well drilling and installation activities are also found, respectively, in Appendices B and C.

For a more in-depth discussion of the entire Superfund Enforcement Program including removal and remedial actions, refer to the "Enforcement Project Management Handbook" (OSWER Directive No. 9837.2-A, January 1991). The handbook addresses the remedial planning and implementation process from the point of the baseline PRP search (generally conducted after the site is placed on the National Priorities List (NPL)), to the point of completion of remedial activity and the site's deletion from the NPL.

Intended Audience

The intended audience for this document is remedial project managers (RPMs), although it can be adapted for use by other parties such as States, PRPs, contractors and other persons involved in the RI/FS process.

Summary of Chapters and Appendices

Volume 1

Chapter 1, "Oversight of PRP RI/FS Activities" gives an overview of the oversight process and the roles and responsibilities of the different participants. This chapter also discusses standards of conduct, a schedule for oversight, and tools available to assist the RPM in performing good oversight. This chapter is intended for those in the audience with little or no background in the oversight process.

Chapter 2, "Pre-RI/FS Negotiation Scoping" discusses how an RPM performs site planning with Regional personnel and technical experts prior to negotiations with the PRP.

Chapter 3, "Post-AOC Scoping" discusses the RPM's detailed site-specific planning of activities during the RI/FS and the PRP's development of Project Plans (for example, Work Plan, Sampling and Analysis Plan, and Health and Safety Plan) prior to the initiation of field activities.

Chapter 4, "Site Characterization" discusses how the RPM oversees PRP-conducted field activities, with the help of an oversight assistant, in order to gather data that characterizes the site, defines the site risks, and helps to evaluate potential alternatives.

Chapter 5, "Baseline Risk Assessment" discusses the RPM's oversight of PRP-conducted Baseline Risk Assessments begun before June 21, 1990 and provides assistance to the RPM and oversight assistant for all EPA-conducted Baseline Risk Assessments begun after June 21, 1990.

Chapter 6, "Treatability Study Task" discusses how the RPM determines the need for treatability studies and oversees the conduct of treatability studies during the RI, which should assist in developing viable alternatives in the FS.

Chapter 7, "Development and Screening of Alternatives" discusses the process of using preliminary remediation goals (PRGs) and the data generated during the RI to establish performance standards and then develop alternatives that can satisfy those standards and EPA's nine evaluation criteria.

Chapter 8, "Detailed Analysis of Alternatives" discusses the comparison and relative performance of the alternatives against EPA's nine evaluation criteria in order to select an appropriate remedy.

Appendix A, "Technical Resources Available to RPMs and Oversight Assistants" is a mini-bibliography of technical resources at the Federal, State, and local government levels available to RPMs and oversight assistants.

In addition to Volume 1, a companion guidance document containing two appendices is being issued to address the identification and resolution of specific site problems encountered by the RPM during the site characterization task of the RI.

Volume 2

Appendix B, "Oversight and Documentation of Field Activities Including Sampling and Analysis Procedures" describes the activities that the oversight team should conduct during field activities.

Appendix C, "Oversight and Documentation of Well Drilling and Installation Activities" describes the activities that the oversight team should conduct during well drilling and construction activities.

1.1 PURPOSE OF OVERSIGHT

The purpose of oversight is to ensure that an RI/FS prepared by a PRP in an Enforcement-lead response action is equivalent to the RI/FS that EPA would have prepared if the site were Fund-lead. The RI/FS must conform to the

requirements of the National Oil and Hazardous Substances Pollution Contingency Plan (NCP), applicable Agency guidance, and any existing Administrative Order on Consent (AOC), Consent Decree (CD), or Unilateral Administrative Order (UAO). Through oversight, EPA provides direction, assures quality, and avoids and solves problems in the conduct of the RI/FS (see Figure 1-1, Phased RI/FS Process).

Note: The terms and conditions governing RI/FS activities may be specified in one of three types of settlement documents, an AOC, CD, or UAO. The AOC, however, is the preferred settlement document. This guidance will use "AOC" exclusively when referencing a settlement document with the understanding that the term encompasses AOCs, CDs, and UAOs for purposes of this guidance.

Under CERCLA Sections 104(a) and 122(a), EPA has the discretion to allow PRPs to perform an RI/FS and to conduct other response actions. A recent change in policy for the PRP RI/FS process is that EPA will not enter into AOCs under which the PRPs perform the risk assessment component of the RI/FS for new risk assessments as of June 21, 1990 (see Chapter 5.) The RI/FS, even though conducted by the PRP, must still be conducted to EPA's standards. EPA determines whether the RI/FS is acceptable, not the PRP. Based primarily upon and supported by the RI/FS, EPA determines if the site warrants remediation and, if so, selects the remedy. Overall, EPA is ultimately responsible for ensuring that the response actions taken at a site protect human health and the environment and meet statutory requirements for response actions.

EPA or an authorized State oversees the conduct of a PRP-lead RI/FS. A PRP-lead RI/FS must be as comprehensive as a Federally funded RI/FS and must be of comparable quality. However, because PRPs do not work directly for EPA, the way EPA oversees a PRP-lead RI/FS must, in some ways, differ from the RI/FS process at Federally funded NPL sites. EPA's oversight authority over PRP-lead RI/FSs includes the ability to enforce the AOC, seek penalties, and ultimately take over the project followed by cost recovery.

Good oversight minimizes EPA's need for using judicial enforcement to obtain the quality RI/FS that EPA and the PRPs agreed to in the AOC. Good planning, continuing review of PRP site activity and deliverables, and regular and effective communications between EPA and PRPs are key items for oversight.

1.2 OVERSIGHT PERSONNEL AND RESPONSIBILITIES AT ENFORCEMENT-LEAD SITES

Introduction

The RPM, with support from a contractor (usually Technical Enforcement Support (TES) or Alternative Remedial Contract Strategy (ARCS)) that is designated the oversight assistant, oversees the RI/FS. RPMs can get further assistance from within EPA, other Federal agencies, and individual State agencies. Together, the RPM, oversight assistant, and additional qualified personnel in EPA or other Federal and State agencies form the oversight team. Table 1-1 lists sources of assistance available to the RPM and the oversight assistant during specific tasks of the RI/FS process. Appendix A expands on this table, describes area(s) of expertise, and explains how to access these resources. For additional information, refer to the "Enforcement Project

Figure 1-1. Phased RI/FS Process

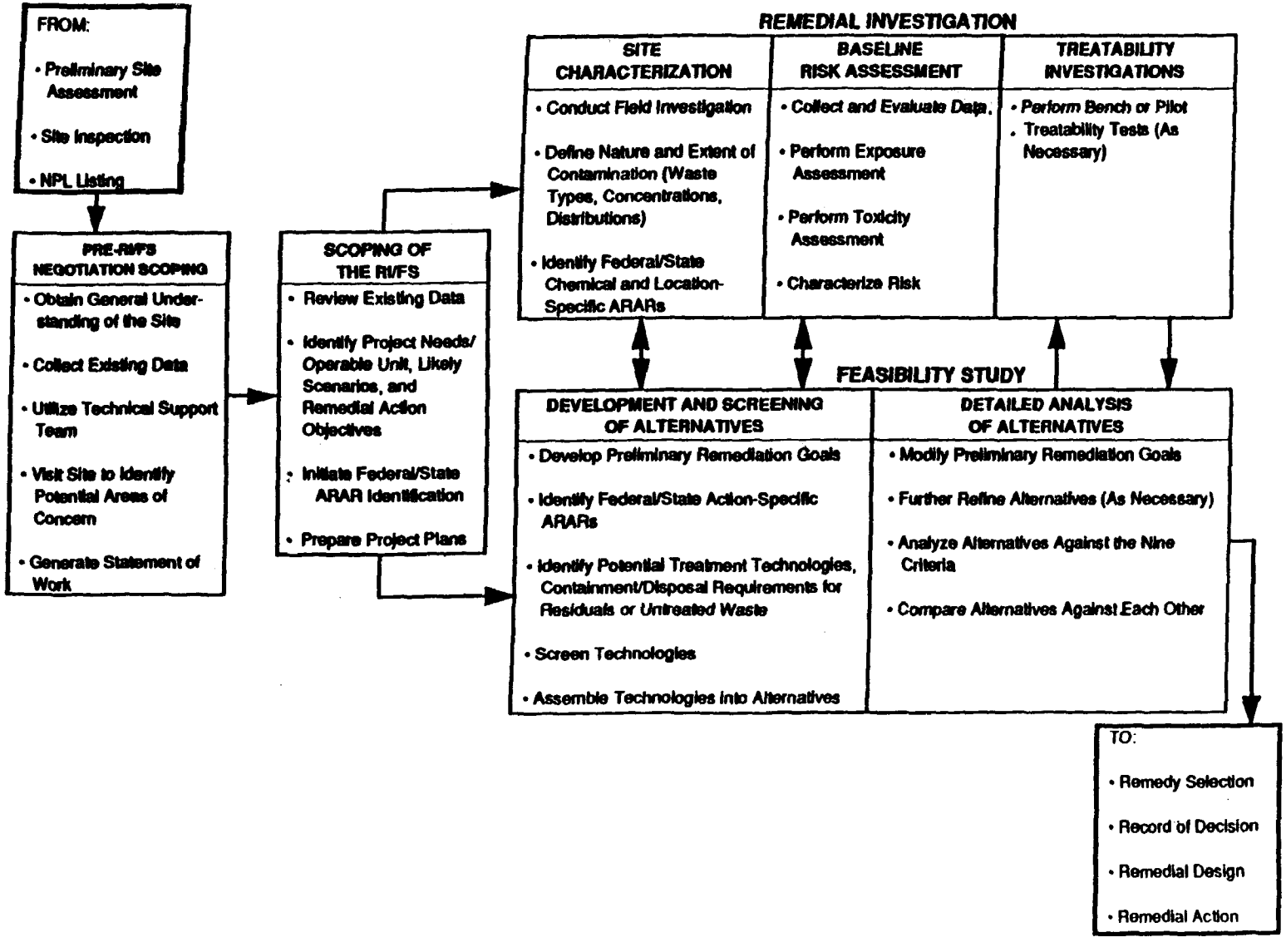


Table 1-1. Capabilities and Specialities of Various Oversight Resources (Page 1 of 4)

OVERSIGHT RESOURCES	PRP-Lead RI/FS Tasks						
	Pre-RI/FS Negotiation Scoping	Post-AOC Scoping	Site Characterization	Baseline Risk Assessment [1]	Treatability Studies	Development and Screening of Alternatives	Detailed Analysis
EPA Regional Offices and Divisions							
Technical Support Team (TST) or Regional Equivalent	●	●	●	●	●	●	●
Environmental Services Division (ESD)	●	●	●	●	●	●	●
Peer Review Group	●	●	●	●	●	●	●
Office of Regional Counsel	●	*				*	*
Pesticides and Toxics Division	○	*	*	*	*	*	
Water Division	○	*	*	*	*	*	
Air Division	○	*	*	*	*	*	
Office of Public Affairs	*	*	*	*	*	*	
Health Assessment Officer	*	*	*	●			
Risk Advisory Committee	*	*	*	●			
EPA HQ							
Office of Waste Programs Enforcement (OWPE)	○	*	*	*		*	*
Office of Emergency and Remedial Response (OERR)	○	*	*	*	*	*	*
Office of Enforcement – Superfund Division	*	*				*	*
Office of General Counsel	○	*					

Legend

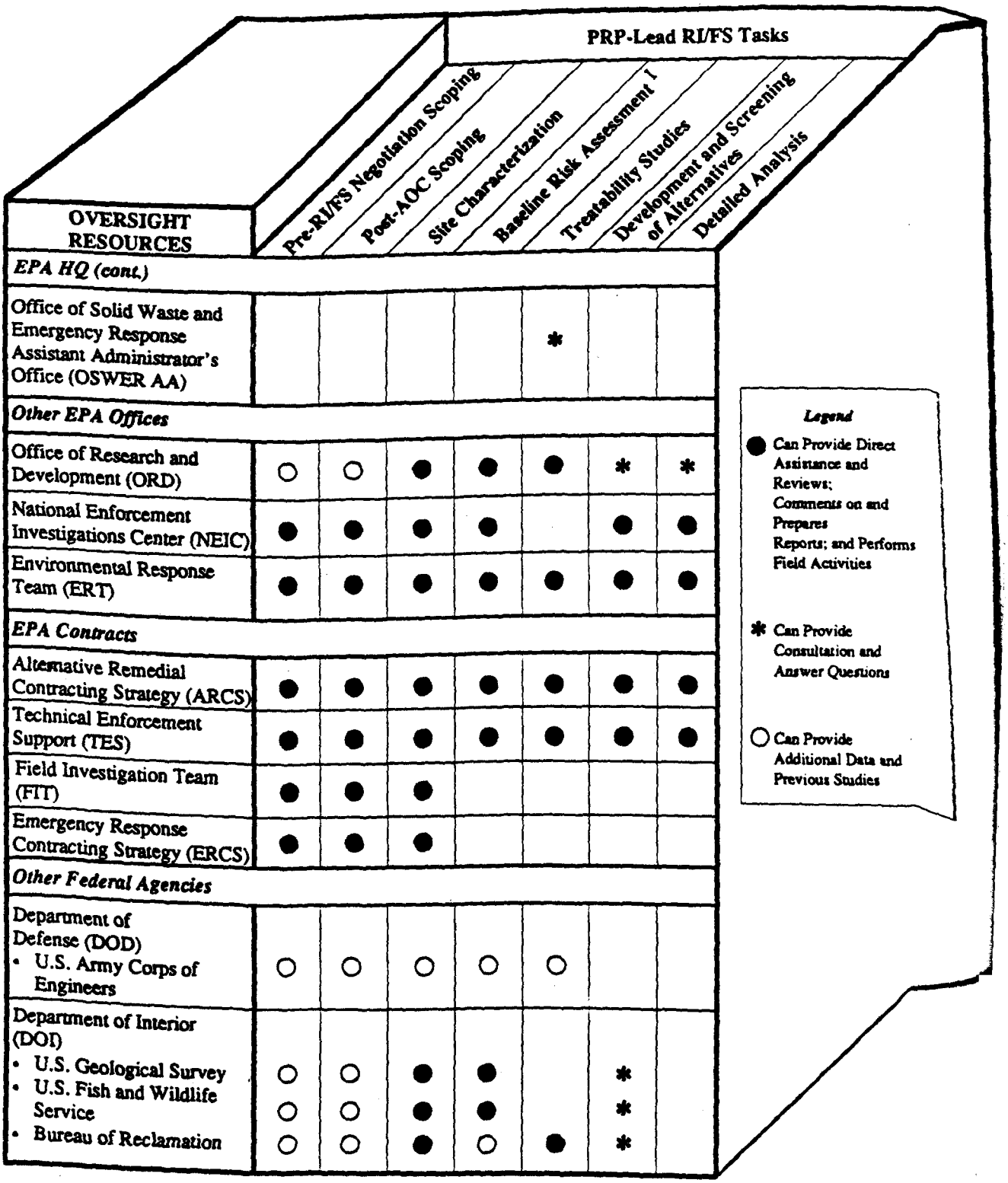
● Can Provide Direct Assistance and Reviews; Comments on and Prepares Reports; and Performs Field Activities

* Can Provide Consultation and Answer Questions

○ Can Provide Additional Data and Previous Studies

[1] As of June 21, 1990, EPA's policy is not to enter into AOCs under which PRPs perform the risk assessment component of the RI/FS as documented in a memorandum of August 28, 1990.

Table 1-1. Capabilities and Specialities of Various Oversight Resources (Page 2 of 4)



OVERSIGHT RESOURCES	Pre-RI/FS Negotiation Scoping	Post-AOC Scoping	Site Characterization	Baseline Risk Assessment [1]	Treatability Studies	Development and Screening of Alternatives	Detailed Analysis
EPA HQ (cont.)							
Office of Solid Waste and Emergency Response Assistant Administrator's Office (OSWER AA)					*		
Other EPA Offices							
Office of Research and Development (ORD)	○	○	●	●	●	*	*
National Enforcement Investigations Center (NEIC)	●	●	●	●		●	●
Environmental Response Team (ERT)	●	●	●	●	●	●	●
EPA Contracts							
Alternative Remedial Contracting Strategy (ARCS)	●	●	●	●	●	●	●
Technical Enforcement Support (TES)	●	●	●	●	●	●	●
Field Investigation Team (FIT)	●	●	●				
Emergency Response Contracting Strategy (ERCS)	●	●	●				
Other Federal Agencies							
Department of Defense (DOD) • U.S. Army Corps of Engineers	○	○	○	○	○		
Department of Interior (DOI) • U.S. Geological Survey • U.S. Fish and Wildlife Service • Bureau of Reclamation	○ ○ ○	○ ○ ○	● ● ●	● ● ○	 ●	* * *	

Legend

● Can Provide Direct Assistance and Reviews; Comments on and Prepares Reports; and Performs Field Activities

* Can Provide Consultation and Answer Questions

○ Can Provide Additional Data and Previous Studies

[1] As of June 21, 1990, EPA's policy is not to enter into AOCs under which PRPs perform the risk assessment component of the RI/FS as documented in a memorandum of August 28, 1990.

Table 1-1. Capabilities and Specialities of Various Oversight Resources (Page 3 of 4)

OVERSIGHT RESOURCES	PRP-Lead RI/FS Tasks: Pre-RI/FS Negotiation Scoping	Post-AOC Scoping	Site Characterization	Baseline Risk Assessment [1]	Treatability Studies	Development and Screening of Alternatives	Detailed Analysis
Other Federal Agencies (cont.)							
Department of Interior (cont.)							
• Bureau of Mines	○	○	●	●	●	*	
• Natural Resources Trustee	○	○	●	●		*	
Department of Agriculture (USDA)							
• Soil Conservation Service	○	○	●	●		*	
• Forest Service	○	○	●	●		*	
• Agriculture Stabilization and Conservation Services	○	○	●	●	○		
Department of Commerce							
• National Oceanic and Atmospheric Administration	○	○	●				
Department of Energy (DOE)	○	○	○	○	●	*	*
Nuclear Regulatory Commission (NRC)	○	○	○	○	●	*	*
Department of Health and Human Services (HHS)/ Agency for Toxic Substances and Disease Registry (ATSDR)	○	○		●			
Department of Justice (DOJ)	●	○				*	*
Department of Labor							
• Occupational Safety and Health Administration (OSHA)	○	○					
Federal Emergency Management Agency (FEMA)	○	○					
Department of Transportation (DOT)							
• U.S. Coast Guard	○	○	●	●	●	●	●

Legend

● Can Provide Direct Assistance and Reviews; Comments on and Prepares Reports; and Performs Field Activities

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[1] As of June 21, 1990, EPA's policy is not to enter into AOCs under which PRPs perform the risk assessment component of the RI/FS as documented in a memorandum of August 28, 1990.

Table 1-1. Capabilities and Specialities of Various Oversight Resources (Page 4 of 4)

OVERSIGHT RESOURCES	PRP-Lead RI/FS Tasks						
	Pre-RI/FS Negotiation Scoping	Post-AOC Scoping	Site Characterization	Baseline Risk Assessment [1]	Treatability Studies	Development and Screening of Alternatives	Detailed Analysis
State Assistance							
State Agency for Environmental Protection	○	○	●	●	●	●	●
Public Health Agency	○	○	*	●			
State Attorney General Office	●						
Court Records of Legal Action	○						
State Fish and Wildlife Service	○	○	●	●		*	
State Soil Conservation Service	○	○	●	●		*	
State Geological Survey	○	○	●	●		*	
State Historic Preservation Office	○	*	*			*	
State Highway Department	○	*	*				
State/Private Academic Institutions	○	○	●	●	●		
Local Assistance							
County or City Health Departments	○	○		●			
Local Planning Boards	○	○		●			
Chamber of Commerce	○						
Town Engineer	○	○	●	*	●		
Local Library	○						
Local Well Drilling Companies	○	●	●				
Local Airports	○		●				
Residential and Municipal Well Logs	○	○	○				

Legend

● Can Provide Direct Assistance and Reviews; Comments on and Prepares Reports; and Performs Field Activities

* Can Provide Consultation and Answer Questions

○ Can Provide Additional Data and Previous Studies

[1] As of June 21, 1990, EPA's policy is not to enter into AOCs under which PRPs perform the risk assessment component of the RI/FS as documented in a memorandum of August 28, 1990.

Management Handbook" (OSWER Directive No. 9837.2-A, January 1991), and "Technical Support Services for Superfund Site Remediation - Interim Directory" (Winter 1989).

Prospects for a quality PRP RI/FS are greatly enhanced when a PRP fully understands what EPA expects, frequently communicates with EPA, and submits periodic deliverables on a pre-determined schedule. PRPs need to:

- Maintain records and other project documentation;
- Keep the RPM informed of progress and problems encountered during the required activities through progress reports and meetings; and
- Submit acceptable deliverables within the timetable agreed upon with the lead agency.

The extent of oversight responsibilities should be discussed during negotiations, defined in the AOC and its attached Statement of Work (SOW), and implemented as site-specific conditions require. To further understand oversight responsibilities in their entirety, all parties involved should thoroughly review both this chapter as well as Chapters 2 through 8, Appendix A in this volume and Appendices B and C in Volume 2, and the RI/FS Guidance (October 1988).

Remedial Project Manager (RPM)

The RPM is the EPA official with primary responsibility for overseeing all remedial response actions undertaken by PRPs. The specific duties of the RPM may vary from site to site and will generally depend upon the PRP's commitment to the project and the complexity of the site. The RPM's duties are discussed, in detail, in Chapter 2 of this manual.

During oversight of a PRP RI/FS, RPMs perform both Regional and other activities throughout the process, including:

Regional Activities

- Approve an oversight assistant and manage his/her activities;
- Identify persons/agencies/extramural resources with particular expertise that will provide technical review of activities and deliverables and agree to the scheduled timeframes;
- Identify the preliminary scope of RI/FS activity;
- Identify the site-specific activities and deliverables required from the PRP;
- Prepare a project schedule for the AOC and monitor PRP adherence;
- Budget intramural and extramural resources to support the project and associated paperwork;
- Verify that the planned activities will meet NCP requirements, satisfy the RI/FS objectives, and satisfy the provisions of relevant guidances;
- Consult with counsel;

- Review all PRP and oversight assistant deliverables to assure quality and provide related technical comments;
- Obtain internal EPA input on specialized matters (for example, groundwater contamination, fractured bedrock, contaminants without toxicity values);
- Adhere to EPA schedule for reviewing deliverables or meeting other deadlines;
- Assure that any aspects of the RI/FS performed by EPA are done promptly (for example, the risk assessment or, applicable or relevant and appropriate requirements (ARAR) analysis);
- Assure EPA management and legal review at major stages (for example, Work Plan, draft RI, proposed plan, and record of decision (ROD));
- Finalize any supplements to the RI/FS and write the proposed plan and ROD; and
- Provide monthly updates of budget and project schedule data in the CERCLA Information System (CERCLIS) in coordination with Regional Information Management Coordinator (IMC).

Other Activities

- Coordinate with the State and, as appropriate, other agencies (for example, Department of Interior (DOI), National Oceanographic and Atmospheric Administration (NOAA), Agency for Toxic Substances and Disease Registry (ATSDR)) on scoping;
- Conduct scheduled and unscheduled site inspections in conjunction with the oversight assistant;
- Meet with PRPs periodically to communicate EPA's requirements and discuss work progress;
- Maintain communication with the State throughout the RI/FS process with an emphasis on understanding State perspective, the State identification of ARARs, and the coordination of community relations;
- Conduct community relations activities, with assistance of the community relations coordinator;
- Maintain the site file, including cost recovery documentation; and
- Establish and update periodically the Administrative Record File in conjunction with the Office of Regional Counsel (ORC).

Both the RPM's scope of responsibility and authority and the extent of oversight that will be required during the RI/FS will be addressed in the AOC. The AOC must include specific provisions for oversight, such as the need to address the reimbursement of Agency oversight costs.

Oversight Assistant

The oversight assistant is the qualified person, usually a contractor, required by CERCLA Section 104(a)(1) to assist EPA with oversight. Qualified persons have the professional qualifications, expertise, and experience necessary to provide EPA with the assurance that it can provide effective oversight. EPA selects the oversight assistant, and services performed by the oversight assistant are paid for by the lead agency, which receives reimbursement through the AOC from the PRP. The oversight assistant typically will be a contractor (TES or ARCS). In some cases, the oversight assistant may be provided by a State through a Cooperative Agreement or by another Federal agency, such as the U.S. Army Corps of Engineers (USCOE), through an Interagency Agreement; in both of these cases the oversight assistant can be a State or Federal contractor.

The RPM has flexibility in defining the oversight assistant's responsibilities at the site. The oversight assistant may be responsible for:

- Assisting in planning of project scope and schedule (see Chapter 2 and 3);
- Reviewing existing site information;
- Monitoring PRP field activities to verify PRP performance in accordance with the AOC, consistency with standard protocols, and use of generally accepted scientific and engineering methods;
- Reviewing deliverables submitted by the PRPs;
- Conducting quality assurance tasks;
- Conducting EPA's risk assessment;
- Drafting any necessary supplements to the RI/FS;
- Conducting contingency planning to protect human health and the environment in the event of an emergency;
- Assisting in reproducing documents for the Administrative Record File in the Regional office and at the site (decisions on what documents to include are made by the RPM in conjunction with ORC);
- Preparing and assisting in implementing community relations deliverables and tasks; and
- Providing site-specific information to the Regional IMCs for input into CERCLIS.

Limits of the Oversight Assistant's Role and Responsibilities

Figure 1-2 summarizes the limits of the oversight assistant's role. The oversight assistant may be allowed to approve minor deviations in field activities due to situations beyond the control of the contractor for which there is an obvious solution. For example, these situations may include a change in a surface water sample location due to an unanticipated decrease in the water elevation, flooding of a sample or well location, or the presence of some other physical obstruction (such as subsurface refusal). The oversight assistant should contact and obtain the advice of the RPM if the oversight assistant believes there is any question of his or her authority to approve a deviation. The oversight assistant may not approve deviations from the Work Plans. Only the RPM may approve these changes.

Figure 1-2. Limits of the Oversight Assistant's Roles

The oversight assistant may be authorized to:

- Monitor and document activities specified in the AOC, SOW, and Work Plan;
- Conduct quality assurance activities;
- Develop contingency plans for field activities; and
- Approve minor deviations that do not affect the site agreement or Work Plan.

The oversight assistant is NOT authorized to:

- Approve modifications in the AOC, SOW, or Work Plan;
- Undertake any responsibility of the PRP;
- Advise or issue directions to any PRP contractor; or
- Assume control of any aspect of the RI/FS.

Management of Site Activities

The RPM or oversight assistant may be required to manage a staff of quality assurance personnel at sites where several activities are being performed concurrently. These personnel generally will be specialists in the activities being performed and will conduct quality assurance tasks, including documenting procedures, obtaining split or duplicate samples, and providing quality assurance tests of materials or workmanship. The staff may also be responsible for providing health and safety monitoring for the community. Management of the staff will include coordination and designation of each staff member's responsibilities and daily compilation of activity logs and field notes (see Section 1.7).

Contingency Planning

The RPM or oversight assistant is also responsible for contingency planning. If there is an unexpected event or emergency, the RPM or oversight assistant should be prepared to instruct their staffs and take the precautions necessary to protect human health and the environment. Unexpected events might include accidents, temporarily denied site access, a *force majeure* event, etc. PRP events that lead to modifications to the Work Plan and disputes are the responsibility of the RPM, not the oversight assistant.

RPM's Review of Oversight Assistant's Responsibilities

Prior to the initiation of site work, and periodically through the RI/FS process, the RPM must review with the oversight assistant their respective roles and responsibilities for the project. To help ensure continued proper performance by the oversight assistant, project responsibilities should be documented in writing. Key areas to cover include:

- Review of Work Plans and quality assurance/quality control (QA/QC) plans;
- Review of existing site information;
- The frequency of site inspections;
- The method of documenting field activities;
- The extent of QA/QC (including the number of split, duplicate, and blank samples, and review of PRP laboratory work (see Section 1.7.2, and Volume 2, Appendix B));
- Reporting requirements to the RPM;
- Continuing communication between the RPM and oversight assistant; and
- Monitoring expenditures.

1.3 OVERSIGHT RESPONSIBILITIES AT STATE-LEAD SITES

Introduction

CERCLA Section 121(f) and NCP Sections 300.500 to 300.525 require EPA to provide opportunities for meaningful and substantial State involvement in the long-term planning process for all CERCLA remedial actions within a State, and in negotiations with PRPs at CERCLA facilities in that State. Federal funding may be provided to States to support a broad range of Superfund response activities. The State's role in overseeing PRP-conducted remedial activities is determined largely during an annual planning process that takes place between EPA and the State. A primary function of this planning process is to determine who will take the lead responsibility for actions at the NPL sites within the State.

State Agreements and Oversight Activities

Designation of the State as lead may be embodied in a Superfund Memorandum of Agreement (SMOA), a Cooperative Agreement (CA), or some other document entered into by EPA and the State. EPA may designate a State the lead responsibility for an enforcement response at any site within its jurisdiction, other than a Federal facility. While CAs are legally binding and often site specific, SMOAs represent a non-binding, general agreement between the State and EPA that establishes their respective roles at NPL sites within that State. Provided it has demonstrated to EPA the capability to do so, the State can have responsibility for the lead role in notifying, negotiating, and developing an enforceable settlement agreement with PRPs (under State law) and overseeing site activities.

The SMOA, generally, is program-wide, rather than requiring specific-State-involvement activities. The nature of overall EPA/State roles in oversight should be outlined in the SMOA and is based on an assessment of the State's technical and legal capabilities as well as on its experience in hazardous waste management practices.

Under CERCLA Section 104(d)(1), the CA is the assistance vehicle that transfers funds to a State and documents both EPA's and the State's responsibilities for a site. There are six different kinds of CAs that correspond to the phases of cleanup responses and support. (See Figure 1-3.) EPA will only enter into a CA with the State agency for Superfund response (usually the State's pollution control agency) as designated by the State's Governor or comparable representative of a political subdivision or Federally

Figure 1-3. Types and Uses of CERCLA Cooperative Agreements

Removal - These CAs are available to fund short-term actions taken to prevent, minimize, or mitigate damage and to stabilize a site prior to further response actions. Removals can include emergency activities, time-critical activities (actions with planning periods of less than 6 months) and actions with planning periods of more than 6 months. Under current Agency policy, the only removal actions for which States may have the lead are removals with a planning period of more than 6 months.

Pre-remedial - These CAs are available to fund Preliminary Assessments (PA) to identify a site and the seriousness of a hazardous substance release, and Site Inspections (SI) to eliminate from consideration those releases that pose no threat to human health or the environment.

Remedial - These CAs are available to fund long-term actions taken to prevent, minimize, or eliminate exposure and damage to human health and the environment.

Enforcement - These CAs are available to fund activities to recover costs for cleanup from PRPs, to oversee cleanup of a site by PRPs, or to compel a PRP to clean up a site (under State law).

Support Agency - These CAs are available to States, political subdivisions, and Federally recognized Indian Tribes to fund management activities that support a site-specific non-State-lead response.

Core Program - These CAs are available to fund CERCLA program activities that are not assignable to specific sites but are necessary to support participation by a State or Federally recognized Indian Tribe in CERCLA response.

recognized Indian Tribe. Enforcement CAs may authorize States with lead responsibilities to undertake such activities as PRP searches, notifications, negotiations, and PRP oversight. (See 40 CFR Part 35, Subpart O for a listing of all activities eligible for funding under enforcement CAs.) States, political subdivisions thereof, and Federally recognized Indian Tribes may apply for enforcement CAs and in doing so must demonstrate that they have the necessary authority, jurisdiction, and administrative capabilities to undertake enforcement actions. States (or political subdivisions or Indian Tribes) must also demonstrate, prior to receiving any Fund money through a CA for PRP oversight, that they have attempted to obtain this funding from the PRPs themselves.

Even if the State does not take the lead in entering into and overseeing an RI/FS settlement agreement, the State may, under certain circumstances, undertake various, mutually agreed upon oversight activities at PRP-lead sites. For example, States might participate in reviewing Project Plans or draft and final reports, overseeing field-related activities, or conducting community relations activities. The State may receive support agency funding under a CERCLA Section 104(d) CA for performing these activities. The State's and EPA's respective roles and responsibilities should be clearly defined in a CA.

Additional information on the States' role in PRP oversight can be obtained from the NCP (40 CFR Part 300, Subpart F), and 40 CFR Part 35, Subpart O as promulgated on June 5, 1990.

State Responsibility for Oversight

When a State assumes responsibility as the lead agency for overseeing an Enforcement-lead remedial project, the project is managed by a State Project Officer (SPO). The site-specific responsibilities of the SPO are generally the same as those previously described for the RPM. The RPM, as the representative of the support agency, may review, comment, and or approve project deliverables (depending on the terms of the AOC, SMOA, CA, or other agreements). The RPM may provide additional assistance such as applicable guidance or training if the SPO requests it.

Further Information

For further information regarding CAs (including site-specific, support, and Core Program), contact EPA's State and Local Coordination Branch in the Office of Emergency and Remedial Response (OERR) at (FTS) 308-8380. For more information on State roles in enforcement, contact EPA's Guidance and Evaluation Branch in the Office of Waste Programs Enforcement (OWPE) at (FTS) 475-6771. References for State involvement include the following:

- Subpart F of the NCP (40 CFR 300.500 through 300.525);
- The Agency's administrative rule for Cooperative Agreements and Superfund State Contracts for Superfund Response Actions (40 CFR Part 35, Subpart 0); and
- OSWER directives in the 9375.5 series, which pertain to State, political subdivision, and Federally recognized Indian Tribal involvement in the Superfund program.

1.4 OVERSIGHT RESPONSIBILITIES AT FEDERAL FACILITIES

Federal facilities are a significant, and unique, portion of the universe of facilities affected by CERCLA. Federal facilities include military bases, Department of Defense and Department of Energy (DOD and DOE) facilities, DOI facilities, and other government-owned or -operated facilities. They constitute almost 10 percent of the NPL sites. Executive Order 12580 delegates CERCLA authorities to EPA and other Federal agencies. Among the delegations contained in this order are CERCLA Section 104 responsibilities. Federal agencies are, in general, authorized to conduct response actions where the release is on, or where the sole source of the release is from, the Federal facility.

At Federal facilities on the NPL, EPA has a statutory consultative role and must both be a party to the interagency agreement under Section 120(e)(2), and approve the final remedy selection that will be contained in the Federal facility's ROD to ensure consistency with EPA's policies and regulations. CERCLA response actions at all Federal facilities must comply with the standards and procedures contained in CERCLA and the NCP. At Federal facilities not on the NPL, EPA has a more limited role. EPA has authority to consult with the other Federal agency and to participate in the final remedy selection if requested by the other agency. While oversight of Federal facilities should be to the same degree as oversight of non-Federal PRPs, it is

important to note certain distinctions that may affect the RI/FS. These distinctions are based on the unique characteristics of Federal facilities:

- The RI/FS will, generally, be conducted under Interagency Agreements (IAGs), also known as Federal Facility Agreements (FFAs), (including as parties Federal facilities, EPA, and where possible, the State -- if it chooses to join) rather than under AOCs;
- The RI/FS will usually be conducted by the other Federal agency; EPA, in general, would not conduct the RI/FS (unless requested to do so, and reimbursed for doing so, by the other Federal Agency);
- Security clearances may be needed to gain access to parts of the facility for oversight purposes;
- Exemptions from statutory requirements are possible with site-specific Presidential orders for national security concerns;
- Federal facility cleanups are sometimes very complex and may involve more than one release and concurrent multiple tenant activities may exist at each site;
- Federal funding for most remedial actions by a Federal facility does not come from the Superfund appropriation to EPA, but out of an appropriation from Congress directly to the Federal agency; and
- Qualifying Federal facilities with Resource Conservation and Recovery Act (RCRA) regulated units routinely are listed on the NPL (at private sites these facilities generally are not listed).

CERCLA Section 120

CERCLA Section 120 addresses the application of CERCLA to both NPL and non-NPL Federal facilities. EPA has developed, in conjunction with the affected agencies, model language for key provisions of CERCLA FFAs (or IAGs) for DOE (memorandum dated May 27, 1988) and for DOD (memorandum dated June 17, 1988). Other Federal agencies should also be using the model language as the basis for any IAG.

Further Information

In response to the unique considerations of Federal facility oversight, EPA created the Office of Federal Facilities Enforcement (OFFE). OFFE assists the Regional media programs in overseeing the Federal agency implementation of CERCLA Section 120 and other statutes. For further information regarding Federal agency response programs, contact the appropriate Regional coordinator in OFFE at (FTS) 475-9801.

References concerning Federal facilities include the following:

- Federal Facilities Hazardous Waste Compliance Manual, OSWER Directive 9992.4, January 18, 1990;
- Executive Order 12580, Superfund Implementation, January 23, 1987;
- Executive Order 12088, Federal Compliance with Pollution Control Standards, October 13, 1978;

- NPL Listing Policy for Federal Facilities, 40 CFR Part 300, 54 Federal Register, March 13, 1989, p. 10520;
- Federal Facilities Negotiations Policy, OSWER Directive No. 9992.3, August 10, 1989;
- Enforcement Actions Under RCRA and CERCLA at Federal Facilities, OSWER Directive No. 9992.0, January 25, 1988;
- Agreement with the Department of Defense -- Model Provisions for CERCLA Federal Facility Agreements, OSWER Directive No. 9992.1, June 7, 1988;
- Elevation Process for Achieving Federal Facilities Compliance Under RCRA, OSWER Directive No. 9992.1a, March 24, 1988;
- Agreement with the Department of Energy -- Model Provisions for CERCLA Federal Facility Agreements, OSWER Directive No. 9992.2, May 27, 1988; and
- Subpart K of the NCP (pending proposal in FY91).

1.5 STANDARDS OF CONDUCT, NONCOMPLIANCE, AND DISPUTE RESOLUTION

Standards of Conduct

The individual(s) performing oversight should be aware of certain standards of conduct in addition to their specific responsibilities for the project. Oversight personnel should perform their duties in a professional, responsible, and non-confrontational manner.

Differences of opinion between the RPM or oversight assistant and the PRPs or their contractor should be avoided. Any observations or suggestions pertaining to field activities, which the oversight assistant or his/her staff may have, generally should be discussed with the PRP field supervisor before talking to the RPM. It should be noted, however, that there may be circumstances that warrant checking with the RPM first. In discussions with the field supervisor, the oversight assistant should avoid the appearance of directing or approving work. Discussions with the PRP field supervisor should be documented and reported to the RPM. For a State-lead site, the oversight personnel should consult the SMOA, CA, or other agreement on the role of the State at the time.

Non-compliance

If, after discussions with the field supervisor, the PRPs or their contractors are found not to be in compliance with the site plans, then the RPM should orally contact the PRPs' project manager. Documentation of the conversation between the RPM and the project manager should be in the form of either a telephone log or meeting notes, whichever is appropriate. Formal notification of noncompliance follows this final attempt at informal resolution.

Disputes do not affect the PRPs' obligations to perform. PRPs must continue to meet their obligations under the AOC while the dispute is pending or risk the imposition of penalties if the resolution is unfavorable to the PRP.

Formal notification of noncompliance occurs when a written notice of disapproval is sent by the appropriate EPA official (usually a Branch Chief or Division Director) to the appropriate PRP representative. Procedures for such notification should be spelled out in the AOC.

Dispute Resolution

Dispute resolution procedures are negotiated items for each AOC. If the PRPs object to EPA's notice of disapproval, they submit their written objections to the designated EPA official (usually a Regional manager) within the period provided in the AOC (usually 14 days) requesting formal dispute resolution. Typically, the parties have 14 days from EPA's receipt of the PRPs' objections to reach agreement through negotiations. If an agreement cannot be reached through negotiations, the RPM must ensure that a written decision is prepared for signature by the appropriate EPA official (usually a Division Director). This decision is generally final, without the ability to appeal. Figure 1-4 summarizes the process for resolving disputes.

Settlement Facilitation

EPA has begun to use consensus-building techniques or settlement facilitation mechanisms in its dispute resolution processes. Due to its informal and impartial nature, settlement facilitation may help resolve disputes in a manner which restores the parties' ability to work together. This is of particular importance in PRP oversight, since the parties have already reached a settlement agreement and presumably wish to preserve it. The use of settlement facilitation is left to the discretion of the Region and does not have to be specifically provided for in the AOC (although it may be). For more information, see the "Interim Guidance on Potentially Responsible Party Participation in Remedial Investigations and Feasibility Studies" (OSWER Directive No. 9835.1a, May 16, 1988).

Remedies for Non-compliance

EPA may impose sanctions in the event that dispute resolution is unsuccessful or if EPA takes over the site. It is advisable that EPA attorneys in the ORC and OE- Superfund Division be alerted in each instance. EPA counsel should be consulted to help determine the appropriate response to noncompliance. Types of sanctions available to the Agency include:

- Injunctive relief (court order to comply)
- Stipulated penalties
- Statutory penalties
- Project takeover and subsequent recovery of costs.

Injunctive Relief

If EPA desires PRP performance of the terms of the settlement agreement instead of, or in addition to, monetary penalties, EPA may seek a court order compelling performance. Subjecting a PRP to a court order may lead to further sanctions against the PRP for failure to comply with the order.

Figure 1-4. Usual Dispute Resolution Process

Informal Discussion

- If work involved is field work, the oversight assistant discusses apparent deviation from site agreement or Project Plans with PRP field supervisor. If work involved is other than field work, RPM discusses deviation with a PRP coordinator. Where concerns are lengthy and very specific (for example, review of a Project Plan), initial communication may be in writing.
- If in the field, the oversight assistant documents decisions of the PRP field supervisor and reports it to the RPM. The RPM calls the PRP project manager regarding the apparent deviation. Conversations are documented in telephone log or memorandum.

Notice of Noncompliance

- EPA provides formal notice of noncompliance in writing.

Dispute Resolution

- PRPs request formal dispute resolution with the Division Director with support by the RPM. (Usually PRPs have 14 days to make the request.)
- Parties negotiate (usually for up to 14 days). Region, usually Division Director or Branch Chief, issues written decision.

Remedies for Noncompliance with the Decision

- If PRPs fail to comply with EPA's decision, EPA may take action, including but not limited to the following: seek stipulated or statutory penalties, enforce the decision, or take over the project and recover costs incurred in assuming responsibility for the response action and for past costs not otherwise recovered.

Stipulated Penalties

PRPs may be subject to monetary penalties, in the form of stipulated and statutory penalties, for failure to perform an activity or complete a deliverable of acceptable quality in accordance with the requirements of the AOC. The amount and schedule of stipulated penalties is agreed upon by the parties in the AOC. The obligations to which stipulated penalties adhere, such as schedule deadlines and deliverables, also are specified in the order or decree.

Additional information on the use of stipulated penalties may be found in the "Model Administrative Order on Consent for RI/FS" (OSWER Directive No. 9835.10, January 30, 1990) and the "Guidance on Use of Stipulated Penalties in Hazardous Waste Cases" (OSWER Directive No. 9835.2b, September 9, 1987).

Statutory Penalties

EPA may seek statutory civil penalties for PRP noncompliance with the AOC. CERCLA Section 106 provides for penalties and Section 107 provides for treble damages for certain violations of AOCs. In CERCLA Section 109, civil penalties range from $25,000 per violation, to $25,000 per day for each violation, to $75,000 per day for second or subsequent violations. These penalties may be assessed administratively, after a hearing, or judicially. Depending on the settlement terms, EPA can seek statutory penalties for any violation of the AOC, whether or not covered by stipulated penalties.

Project Takeover

EPA can move to take over all or a portion of the RI/FS by replacing the PRP activities with Fund-financed actions. To take over the RI/FS, EPA must notify the PRPs that it will undertake the response action, generally citing the applicable provision of the AOC, and issuing a stop-work order to the PRPs with a notification to the EPA remedial contractors.

In issuing stop-work orders, RPMs should be aware that Fund resources may not be immediately available. But, in the case of PRP actions that immediately threaten human health or the environment, there may be no other course of action than to issue a stop-work order. Once the stop-work order is issued, a Fund-financed RI/FS will be undertaken consistent with EPA funding procedures.

In the notice to PRPs and EPA remedial contractors, the effective date of project takeover should be specified and the reason for the takeover provided. In addition, EPA's reservation of rights to seek reimbursement for costs incurred by the United States (or the applicable State) should be reiterated in the notice. EPA counsel in ORC and OE-Superfund Division should be provided copies of all notices and can assist in determining whether further legal action should result from PRP noncompliance.

1.6 SCHEDULE FOR OVERSIGHT

RI/FS activities are typically complex and require a significant degree of organization, coordination, and integration to ensure the development of a product sufficient to determine an appropriate remedial action. Prior to negotiations, EPA, with support from a contractor, will determine the project scope. After the project is scoped, Work Plans will be developed by PRPs and reviewed in detail and approved by EPA. At the onset of an RI/FS, greater oversight of planning and proposed field work is necessary. The RPM should identify the oversight activities that must be performed as well as the individuals who will conduct them. The RPM must ensure that these individuals are fully qualified to oversee the necessary activities.

The specific level of oversight will vary from site to site and will depend on factors such as the complexity of the site or particular components of the RI/FS. It will also depend on the level of confidence in the technical expertise of the PRPs (or their contractors) to perform the work, and performance of PRPs on prior deliverables. Additionally, the level of oversight will vary with the specific activity or task. For example, the RPM should be on site to observe sampling activities, particularly contaminant sampling (as opposed to stratigraphic sampling), well construction, and drilling operations for at least the first several wells. The oversight assistant, however, is responsible for overseeing all site and sample collection activities. RPM oversight for the initial wells is particularly important to assure that any specified equipment is

used and decontaminated before use and to observe the diligence of the PRPs' geologist and driller. On the basis of the initial well installation, less RPM oversight might be necessary for subsequent drilling operations.

In determining the appropriate level of oversight, the RPM also should examine the Work Plan and the SAP, paying particular attention to the PRPs' work schedule. This work schedule should be converted to a timeline (see Figure 1-5 and the "Enforcement Project Management Handbook" (OSWER Directive No. 9837.2-A, January 1991 for examples of timelines)) so that the critical activities can be identified. In addition, the AOC should require the PRPs to provide advance notice of sampling events. Examples of critical activities that occur during the RI/FS include:

- The installation of sampling and monitoring devices (including the establishment of sampling grids);
- Sampling events;
- The use of on-site field analytical techniques; and
- The submittal of draft and final reports and any other major deliverables.

In addition to scheduled site visits, some unannounced inspections should be made periodically, particularly during and after adverse weather conditions when site characteristics may change (for example, drainage patterns, wind damage, temperature effects on equipment).

Day-to-day interaction between the RPM and PRPs may be needed, depending on factors such as site complexity, PRP recalcitrance, and quality of performance. Day-to-day interaction between the RPM and oversight assistant, on the other hand, may not be required but is strongly suggested.

1.7 TOOLS FOR OVERSIGHT

Good PRP oversight throughout the RI/FS process involves the use of a variety of tools available to the RPM. Some of the more important tools include the following:

- Knowing the location of and how to access various kinds of technical assistance in an efficient manner;
- Requiring the amount of PRP documentation necessary to justify (even before a court) why a decision was made, how to approve or disapprove a deliverable, why an activity should be conducted or not, and how the activity performed will generate quality data that can be used to select a remedy;
- Conducting regular meetings with the PRP (and their contractors) and, as necessary, with Regional managers, technical experts, the oversight assistant, States, Natural Resource Trustees, and the community to address site-specific concerns;
- Requiring PRPs to submit deliverables, in a timely manner, that are complete, accurate, and representative of the data obtained; and
- Assuring that the PRP activities satisfy the QA/QC requirements of EPA and the Regional standard operating procedures.

Figure 1.5a. Recommended RI/FS Process: Ideal Scenario

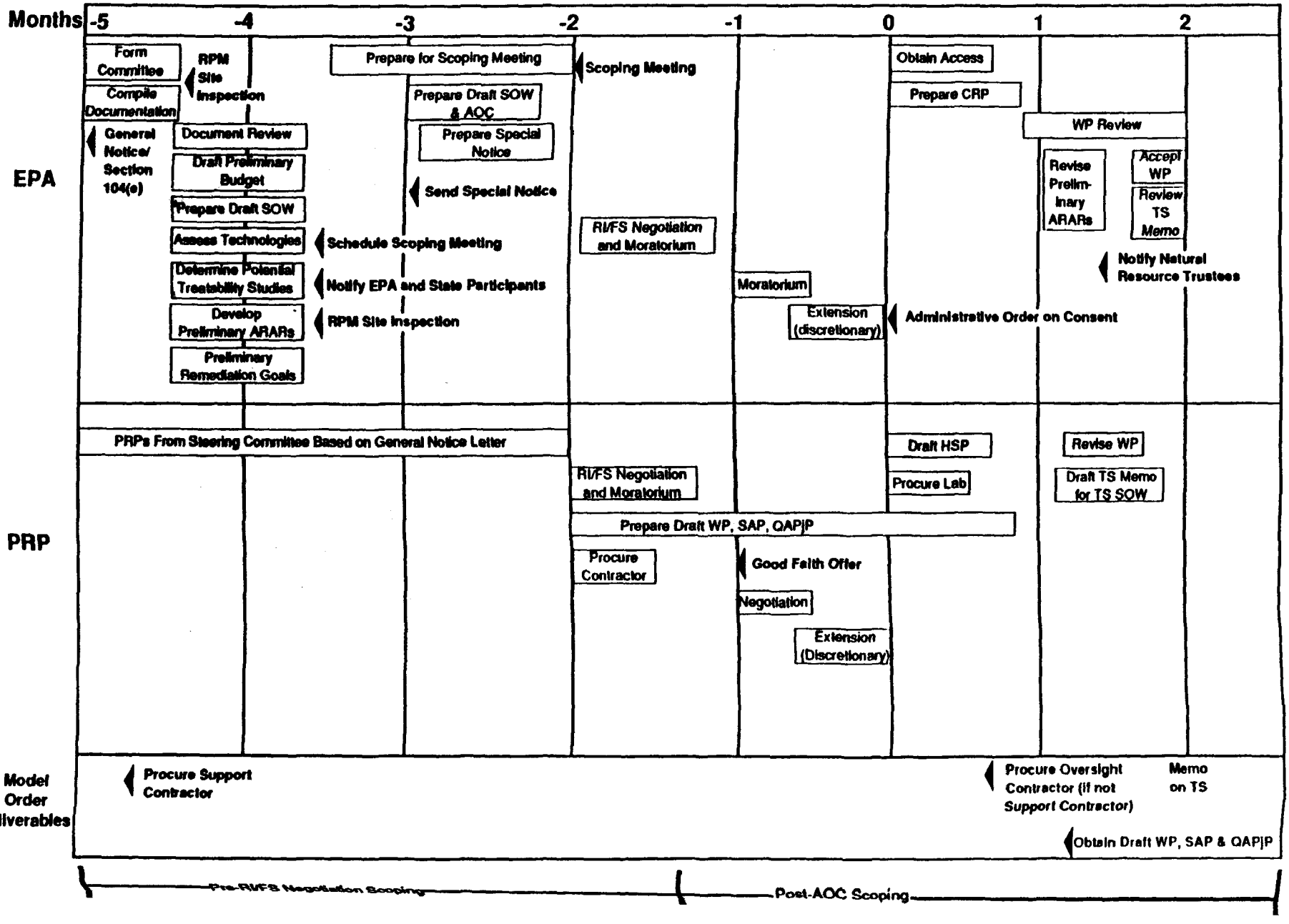


Figure 1.5b. Recommended RI/FS Process: Ideal Scenario (Continued)

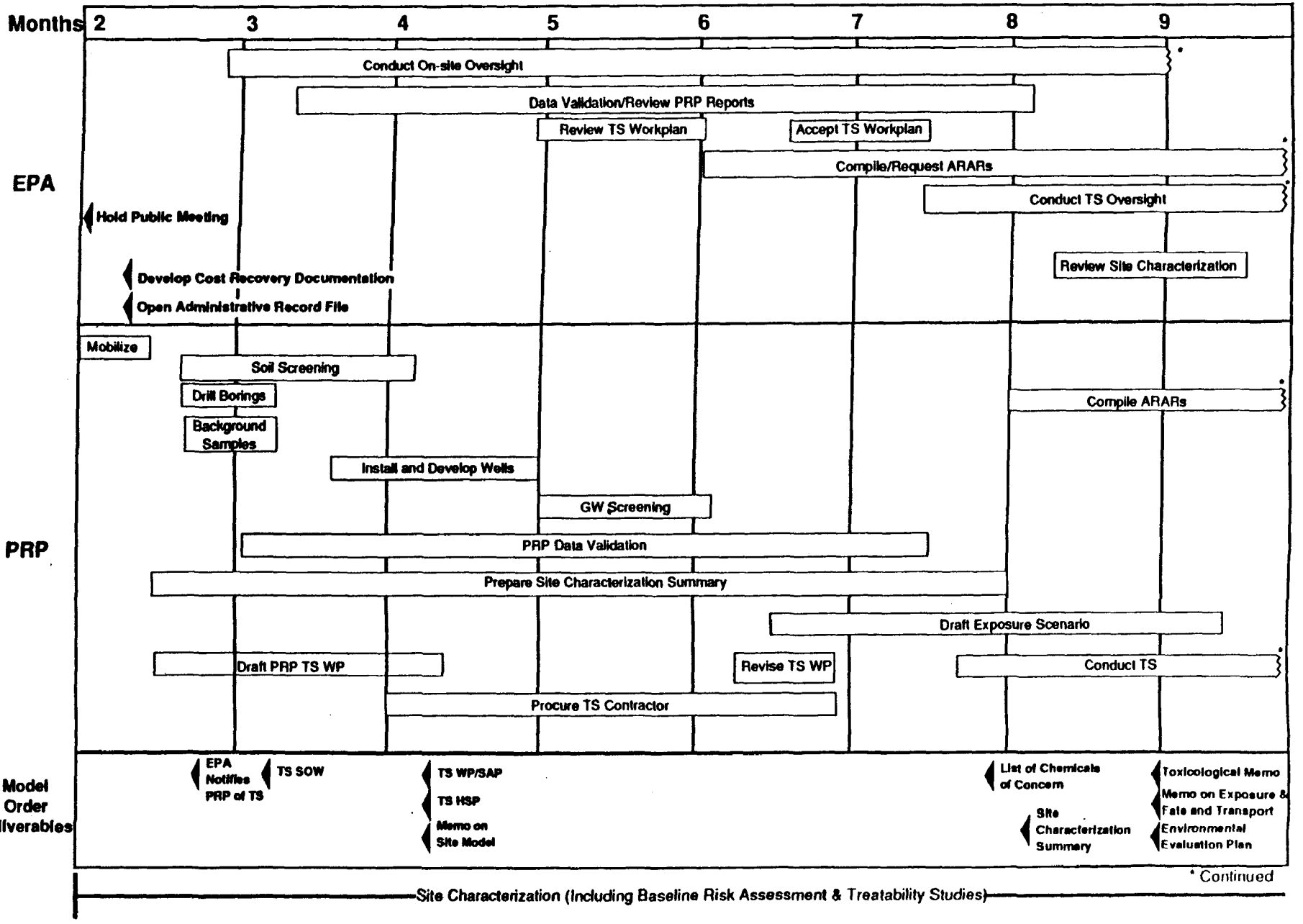


Figure 1.5c. Recommended RI/FS Process: Ideal Scenario (*Continued*)

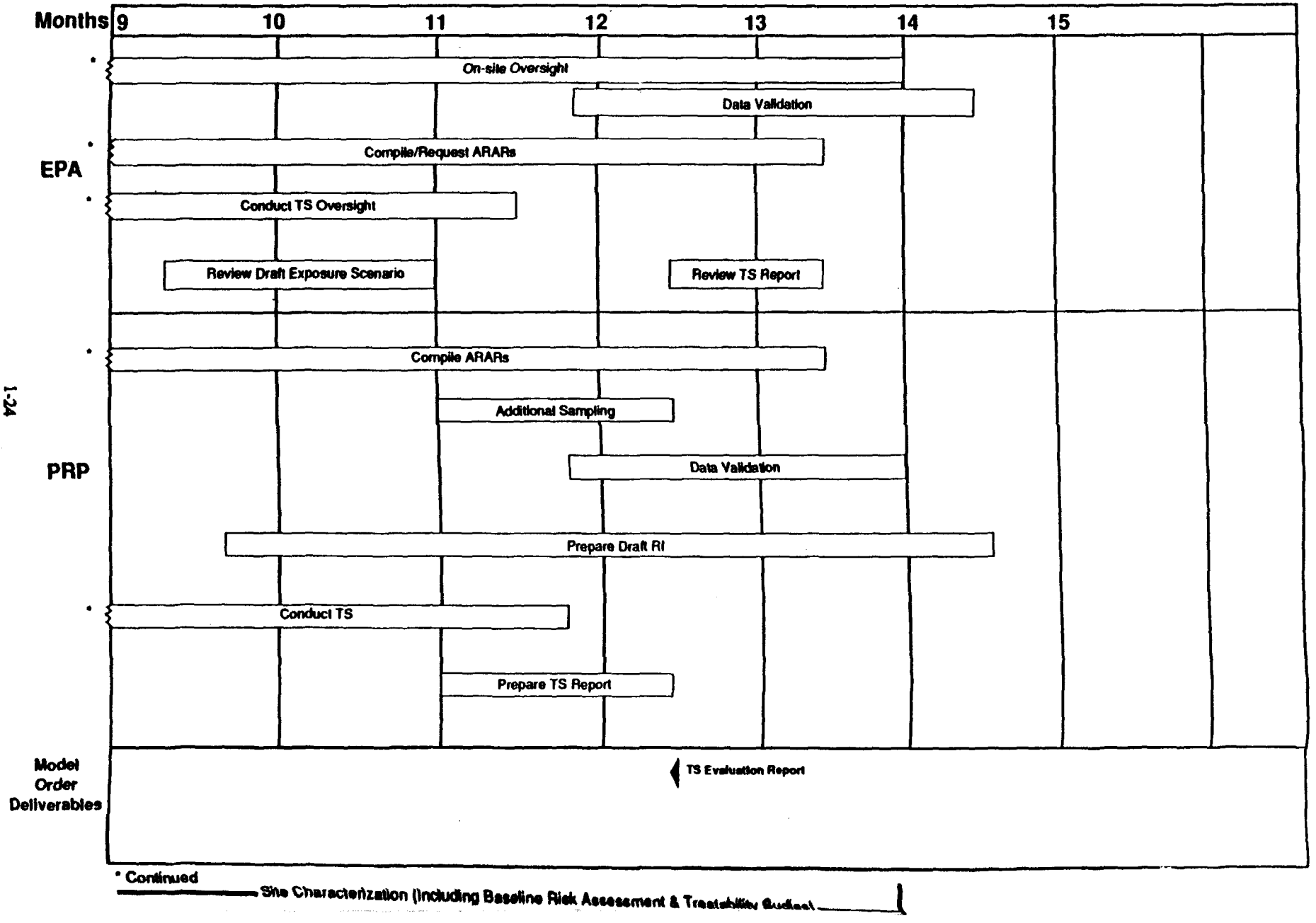
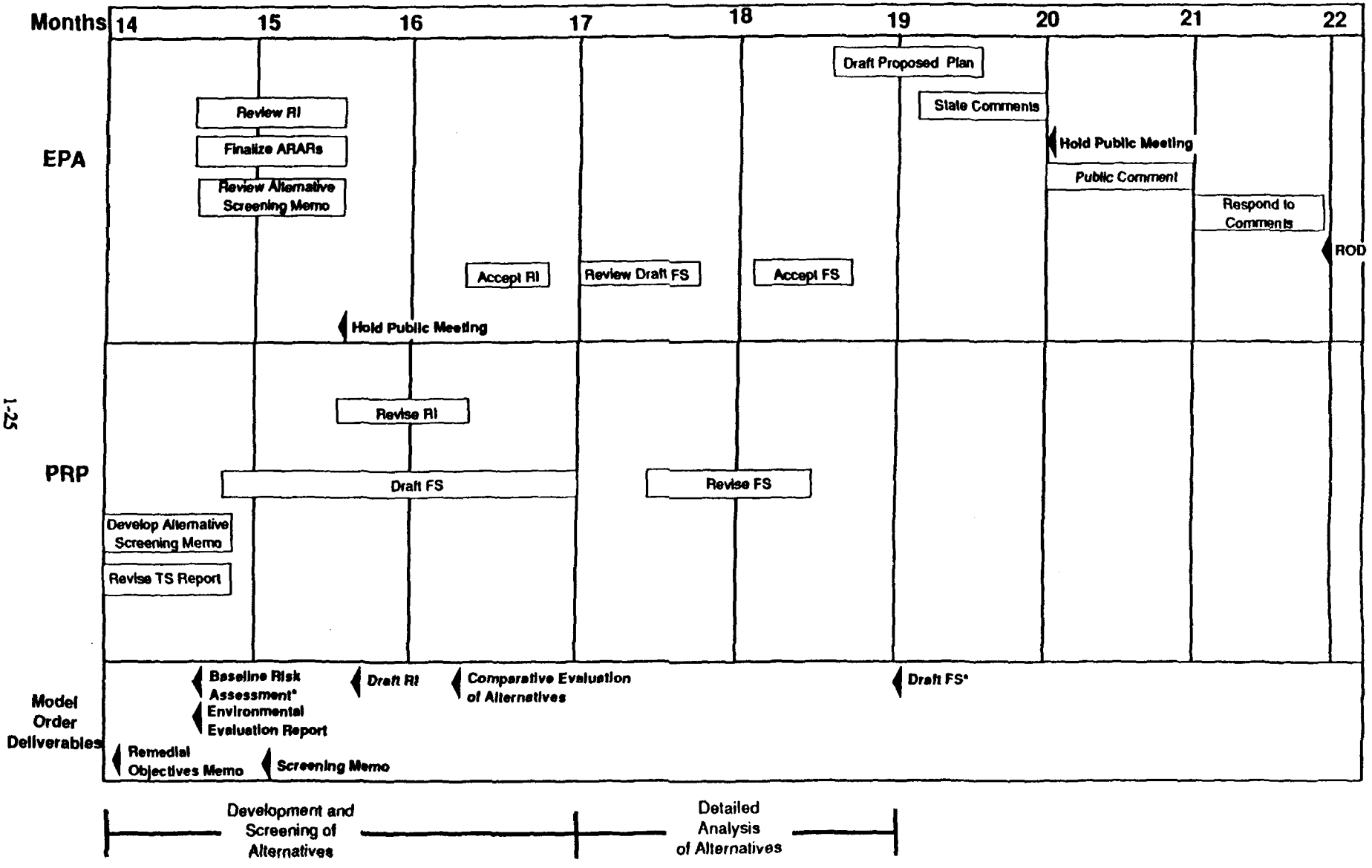


Figure 1.5d. Recommended RI/FS Process: Ideal Scenario (Continued)



Technical Assistance

Technical assistance available to the RPM throughout the major tasks of the RI/FS was presented in Table 1-1 of this guidance. Additional sources may also be found in Appendix A and throughout Chapters 2 through 8, especially in the "Resources Available to the RPM" section of each chapter.

Oversight Records and Documentation

Preservation of Records

Under most AOCs, PRPs must preserve all records, documents, and information of any kind relating to the performance of work at the site for a minimum of 10 years after commencement of construction of any remedial action. After the 10-year period, the PRPs should offer the records to the lead agency before destroying them. This matter is covered in the Model AOC.

Decision Records

Records of particular interest include PRP administrative orders, technical and analytical documentation, and actions or communications either between PRPs or between PRPs and a lead agency that involved or lead to a decision. Document control through consistent maintenance of accurate and complete records, field logs, and laboratory reports should be a key element of all recordkeeping practices.

Documentation

Accurate documentation is important for use in cost recovery actions and in remedy challenges to maintain consistency with NCP requirements. EPA's oversight responsibilities include maintaining records and other project documentation. The major repositories for maintaining project records are the site file and the Administrative Record File. The following terminology is useful in discussing the documentation activities associated with CERCLA sites:

- Site File - EPA's master filing system, which contains all documents relating to a site. A summary of information about the site file is contained in Figure 2-2 of this guidance.

- Administrative Record File - A subset of the site file, which contains those records that may form the basis of the selected response action. A summary of information about the Administrative Record File is contained in Figure 3-3 of this guidance.

- Cost Recovery Documentation - The process of accounting for costs incurred by EPA that PRPs agree to reimburse under or in connection with an oversight contract or AOC. A summary of information about costs and categories of expenditures is contained in Figure 3-2 of this guidance.

- Activity Reports - The tools that are used by the oversight team to document PRP field activities may include all or some of the following activity reports:

  - Field activity report - assists in identifying the critical field activities while also providing a convenient means to document these activities (see checklists in Volume 2, Appendices B and C, on the documentation of sampling and well drilling procedures to assist the RPM);

- Field logbook - either records facts that are not necessarily included in the field activity report (such as pertinent conversations, explanations of changes, etc.) or substitutes for the field activity report; and,

- Photographic or video log - illustrates the critical field activities (such as sampling and well construction).

Additional information on activity reports is contained in Chapter 4 of this guidance.

- Laboratory Reports - For all fixed, mobile, and local laboratories (used by either EPA or PRPs), specific reporting requirements should be maintained including chain-of-custody forms and analytical results. These reports should specify the QA procedures and QC parameters (e.g., precision, accuracy, representativeness, completeness, and comparability) that will be met during the testing analysis. Additional information on the use of laboratories is contained in Chapter 4 of this guidance.

- Progress Reports - The oversight assistant and PRP may be required to submit reports (usually monthly) to the RPM describing all field activities conducted since the last report, deliverables submitted since the last report and their review progress, and all QA/QC checks or audits conducted since the last report. Additional information on project status reports is contained in Chapter 3 of this guidance.

Meetings

The oversight team should meet regularly with the PRPs and their field supervisory personnel to discuss performance, status, problems, and new discoveries that may develop during the required activities. Some meetings between the PRPs and the lead agency should be mandatory and required in the AOC. However, other meetings may be requested by either the PRPs or the lead agency at any time. Generally, meetings are held before the initiation of work, periodically during field and other activities, prior to each major task, and following PRP submittal of draft deliverables. Meetings should be held to provide direction, informally resolve problems, discuss changes in the scheduling of activities, or identify deficiencies. The frequency of meetings is subject to Regional discretion in response to PRPs' performance and work. Examples of some of the types of meetings that the RPM should conduct are provided in the following sections.

Internal Scoping Meeting

A meeting with members of the oversight team, prior to negotiations with the PRP, to discuss the understanding of the site and identify any specific concerns of EPA, State, and technical experts. (See Chapter 2 of this guidance.)

Kickoff Meeting with PRPs

A meeting of the RPM, oversight assistant, and members of the Technical Support Team (TST) with the PRPs' project manager and supervisory personnel (including contractors) to discuss respective roles, responsibilities, schedules, and procedures. (See Chapter 3 of this guidance.)

EPA Management and State Review Meetings

A series of meetings to discuss specific concerns during project scoping, review of the PRP Work Plan, review of the draft RI (and documents produced during the RI such as EPA's Baseline Risk Assessment, treatability studies, and identification of ARARs), and review of the FS. (See Chapters 2 through 8 of this guidance.)

Project Status Meetings

Regular meetings with the oversight assistant and members of the Technical Support Team (TST) to discuss the performance, status, and problems that develop during each task of the RI/FS. (See Chapters 2 through 8 of this guidance.)

Submittal and Review of Deliverables

PRPs submit three categories of deliverables. The first are those that need EPA approval before work can either begin or continue. The second category includes interim deliverables that the lead agency has the option to review. These deliverables allow EPA to receive ongoing reports throughout the oversight process and assure EPA that the work being performed meets the terms and conditions of the AOC. These interim deliverables are generally the components of a larger draft or final report and allow EPA to identify potential problems regarding the collection or interpretation of data before submission of the entire report. The third category of deliverables involves review but no approval from the lead agency. These include PRP progress reports. The purpose of these deliverables is to keep the project on schedule within predetermined timeframes. Figure 1-6 gives examples for each of the three categories of RI/FS deliverables as recommended by the Model SOW in PRP-lead RI/FSs.

Deliverables (including reporting requirements) beyond those required by EPA's RI/FS Guidance are appropriate [because of the difference in the relationship between EPA and the entity conducting the work in a Fund- versus PRP-lead RI/FS.] RPMs should point out to PRPs that different deliverables are required in the Model SOWs for Fund- and PRP-lead RI/FS. The deliverables for a given PRP-lead site are specified in the AOC and its attached SOW.

Project Plans, Draft and Final Reports, and Interim Deliverables

The Model AOC provides that PRPs submit all Project Plans (Work Plan, SAP, and HSP), draft and final reports, and interim deliverables to both the lead and support agency for review. The reports should meet the requirements described in EPA's RI/FS Guidance and Risk Assessment Guidance. Specifically, these reports must conform to the format and content requirements. Deficiencies in the report format or content must be noted so the PRP can make the appropriate revisions. In general, the RPM should contact the PRPs' project manager, rather than the PRPs' contractor, in the event that the RPM disagrees with any aspect of the report(s).

Note: EPA should encourage PRPs to select a single point of contact when dealing with EPA on matters concerning oversight of technical concerns. This contact point can be mandated in the AOC and might be a PRP or an independent PRP representative. The use of a single contact has proven significantly to reduce communication problems between EPA and PRP groups.

Figure 1-6. Categories of RI/FS Deliverables*

Examples of PRP Deliverables for EPA Review and Approval

- Work Plan and Sampling and Analysis Plan (SAP)
- Technical Memorandum on Modeling of Site Characteristics
- Technical Memorandum Listing Hazardous Substances and Chemicals of Concern
- Technical Memorandum Describing Exposure Scenarios and Fate and Transport Models
- Technical Memorandum Listing Toxicological and Epidemiological Studies
- Plan for Evaluating Environmental Risk
- Ecological/Environmental Assessment
- Baseline Risk Assessment (if begun by PRPs prior to June 21, 1990)
- Draft Remedial Investigation (RI) Report
- Technical Memorandum Identifying Candidate Technologies
- Treatability Testing Work Plan and SAP
- Treatability Study Evaluation Report
- Technical Memorandum Summarizing Results of Comparative Analysis of Alternatives
- Draft Feasibility Study (FS) Report
- Final RI Report
- Final FS Report

Examples of Deliverables for EPA Review and Comment

- Site Health and Safety Plan (HSP)
- Preliminary Site Characterization Summary
- Treatability Testing Statement of Work
- Treatability Study Site HSP
- Technical Memorandum Documenting Revised Remedial Action Objectives**
- Technical Memorandum on Remedial Technologies, Alternatives and Screening

Examples of Deliverables for EPA Review

- Progress Reports

* Extracted from OWPE's "Model Statement of Work Conducted by PRPs," OSWER Directive No. 9835.8, June 2, 1989

** Note: If EPA conducts the Baseline Risk Assessment, this memorandum should be reviewed and approved by EPA.

PRPs may be requested to submit revisions of draft Project Plans and reports if they do not meet the criteria in the RI/FS Guidance, AOC, or Work Plan. Poor quality reports are a primary cause for delay in the RI/FS and often result in increased oversight costs. To avoid delays and unnecessary oversight costs, the RPM should meet with the PRPs prior to their submittal of any draft Project Plan or final report to ensure that the report will not be considered incomplete or of unacceptable quality. The RPM must also verify that the draft and final reports are submitted in a timely manner consistent with the schedule of deadlines for deliverables included in the AOC.

Oversight of QA/QC Activities

Performing oversight of QA/QC activities assures the lead agency that the work conducted by PRPs is done properly and that the data collected are of sufficient quality, both to support decisions regarding the method of cleanup and to stand up in court. The purpose of the QA program is to provide detailed plans to guide the work and a mechanism to monitor the quality of that work. The purpose of QC is to take samples and introduce them into a measurement system at any time during the site analysis phase of the RI/FS.

Goals of QA/QC

The goals of QA/QC are:

- Precision - A measurement of the reproducibility of measurements compared to their average value. Precision is measured by the use of splits, replicate samples, or co-located samples and field audit samples.
- Accuracy - This measures the bias in a measurement system by comparing a measured value to a true or standard value. Accuracy is measured by the use of standards, spiked samples, and field audit samples.
- Representativeness - This is the degree to which a sample represents the characteristic of the population being measured. Representativeness is controlled by defining sample protocols and adhering to them throughout the study.
- Completeness - This is the ratio of validated data points to the total samples collected. Completeness is achieved through duplicate sampling and resampling.
- Comparability - This is the confidence that one data set can be compared to another. Comparability is achieved through the use of standard methods to control the precision and accuracy of the data sets to be compared by use of field audit samples.

QC Audits and Sampling

The types of QC samples available to assist the RPM are included in Figure 1-7. The types of QC audits that should be used by RPMs to document the implementation of adequate QA measures include:

- Performance Audit - This audit is based on samples with known concentrations and determines whether the analytical measurements system is operating within established control limits.
- Technical System Audit - This audit evaluates field operations against the approved protocols and QA plans.

Figure 1-7. Types and Uses of QC Samples

Field Blank	Exposed during sampling to detect accidental or incidental contamination.
Field Rinsate Blank	Sample collected after passing distilled water over the sampling preparation apparatus after cleaning, to check for residual contamination.
Field Rinsate	Sample collected after passing distilled water over the sampling preparation apparatus after cleaning, to check for residual contamination.
Reagent Blank	Organic-free water sample analyzed as a routine sample to check for reagent contamination.
Calibration Check Standard	A standard material to check instrument calibration.
Spiked Extract	A separate aliquot of extract to which a known amount of analyte is added to check for extract matrix effects on the recovery of added analyte.
Spiked Sample	A separate aliquot of sample having an appropriate standard reference material added to check for sample and extract matrix effects on recovery. (It is not recommended to spike samples in the field.)
Total Recoverable	A second aliquot of the sample which is analyzed by a more rigorous method to check the efficiency of the protocol method.
Laboratory Control	A sample of known concentration (and known to the laboratory) carried through the analytical procedure to determine overall method bias. (These samples are also known as internal laboratory audits or control audits).
Reextraction	A reextraction of the residue from the first extraction to determine extraction efficiency.
Split Extract	An additional aliquot of the extract which is analyzed to check injection and instrument reproducibility.
Field Splits	The prepared sample is split into two or more portions to provide blind duplicates for the analytical laboratory to indicate within-batch error. (A third may be sent to a referee laboratory to determine interlaboratory precision. Such samples are often called replicates).
Field Duplicate	An additional sample taken near the field sample to determine total within-batch measurement variability. (Sometimes called a co-located sample).
Field Audit (Trip Blank)	A sample of known concentration that is taken to the field with the sampling crew, and sent through the sample preparation facility to the laboratory with the field samples to detect bias in the entire measurement.
External Laboratory	A sample of known concentration sent directly to the laboratory for analysis.
Audit	The analyte concentrations are unknown to the laboratory. This type of sample is used to estimate laboratory bias and, external QC of, the laboratory.
Internal Laboratory Audit	A sample of well-characterized media whose analyte concentrations are known to the laboratory to be used for internal laboratory QC.
Split Sample	An additional sample analyzed by Environmental Services Division (ESD) to provide an independent check of the PRP chosen laboratory.

- Data Quality Audit - This audit evaluates the documentation of data quality indicators and determines whether methods and Standard Operating Procedures (SOPs) in the QA plan were followed and satisfied the data quality objectives.

- Management System Audit - This audit evaluates the laboratory certification program, QA in field operations, QC in the certified laboratory, and corrective actions of the entire program.

QC of sampling activities should ensure that:

- A sampling protocol on the sampling objectives, sampling procedures, and analytical strategies is used;

- Sampling devices must not alter the sample in any way;

- Field QC samples are collected, stored, transported, and analyzed in an identical manner to those for site samples;

- Standard collection procedures surrounding the location of the sample are used; and

- Samples are preserved between collection and analysis.

Summary of the Oversight Process

This chapter describes the professionals and resources available to an RPM in order to perform oversight of an RI/FS conducted by a PRP. The RI/FS should take place in accordance with all EPA regulations, guidance, and policy regardless of who conducts the RI/FS. The data are collected to identify site risks, develop alternatives, select a preferred remedial alternative, and write a ROD, as summarized in Figure 1-8, whether EPA, the State, or the PRP assumes the lead.

The major tasks in performing RPM oversight include the following:

- Obtain needed technical, administrative, and legal assistance before negotiations with a PRP;

- Document all remedial decisions and keep complete records for all field and non-field activities;

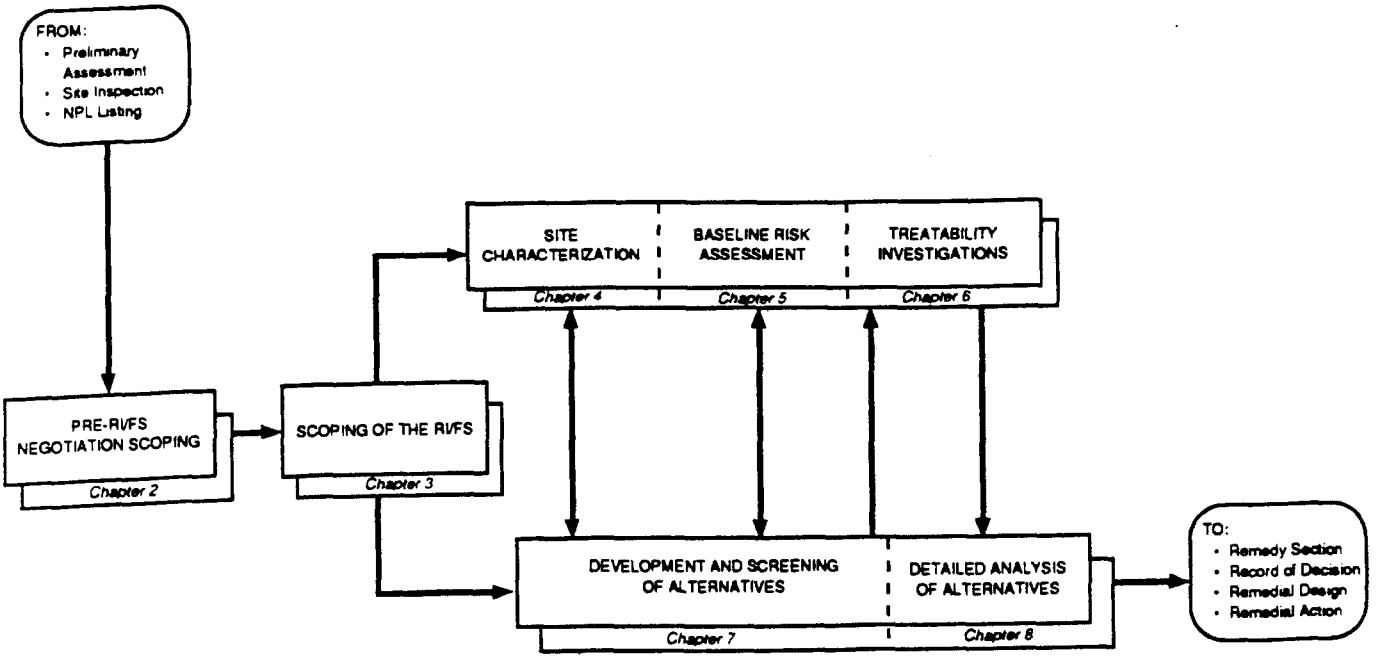
- Contact, as often as needed, all involved parties;

- Develop and keep to a workable schedule for activities and deliverables;

- Ensure that all remedial activities satisfy EPA's QA/QC concerns; and

- Notify PRPs and, if necessary, EPA counsel of noncompliance.

Figure 1-8. Overview of the Process



Specifically, how the RPM uses the available personnel and resources to perform a good oversight during each major task of the RI/FS is the focus of Chapters 2 through 8.

CHAPTER 2

PRE-RI/FS NEGOTIATION SCOPING

2.1 INTRODUCTION

Pre-RI/FS negotiation scoping (or "pre-scoping") is the initial task performed by the RPM with the help of a support contractor. Although usually there is no enforceable agreement with the PRP at this time, the RPM needs to begin developing a site-specific Statement of Work (SOW) that will be attached to the Administrative Order on Consent (AOC). This pre-scoping usually begins several months before a Special Notice Letter (SNL) for an RI/FS has been sent out to the PRP. Pre-scoping usually is completed when the RPM:

- Visits the site to identify the conditions of the site, the effects of contaminants, and the potential areas of concern;
- Obtains a general understanding of the site using the existing information, and determines the general types of data needed to make a remedy selection decision
- Utilizes a Technical Support Team (TST) to assist on the RI/FS and in executing the tasks of future PRP oversight; and
- Generates a preliminary site-specific SOW to be included in the AOC.

Note: As a reminder, the terms and conditions governing RI/FS activities may also be specified in a CD or a UAO; however, the AOC is the preferred settlement document. In this guidance, AOC, CD, and UAO are treated as synonymous.

2.2 PURPOSE AND GOAL FOR THE RPM

During pre-scoping, the RPM needs to gain a general, not detailed, understanding of the site conditions using existing information. This understanding will facilitate later negotiations with the PRPs. The RPM should determine what additional general and site-specific information will be needed in order to make a remedy selection decision. The RPM must ensure that this information will be obtained during the RI/FS process. The RPM needs to know what the site looks like, what data exist for the site, what is the extent of the contamination, what kind of expertise is needed on the TST, and what specific data requests should be included in the SOW and AOC.

As a guide for developing the site-specific SOW, the RPM should apply the "Model Statement of Work for a Remedial Investigation and Feasibility Study Conducted by Potentially Responsible Parties" (OSWER Directive No. 9835.8, June 2, 1989), and any Regional Model SOW or Model Work Plan. In some cases, Regions may prefer to use a Model Work Plan instead of a SOW. By conducting meetings with the support contractor and members of the TST, the RPM should gain the knowledge needed to determine if the SOW satisfies the known needs of the site, including any concerns specific to the site, and if the SOW addresses items not appropriate to the site.

The site-specific SOW will be included in the negotiated AOC. As a guide for developing an AOC, the RPM should reference the "Model Administrative Order on Consent for CERCLA Remedial Investigation/Feasibility Study" (OSWER Directive No. 9835.3-1A, January 30, 1990), and any Regional Model Order. The AOC establishes what is expected of the PRP throughout the RI/FS process. Under a revised policy, EPA will not enter into AOCs under which the PRPs perform the risk assessment component of the RI/FS for new risk assessments effective June 21, 1990. (See "Performance of Risk Assessments in Remedial Investigation/Feasibility Studies (RI/FSs) Conducted by Potentially Responsible Parties (PRPs)" (OSWER Directive No. 9835.15, August 28, 1990.)) The AOC should reflect this development.

The goal of pre-scoping is for the RPM to develop a site-specific SOW, and to use the information gathered to determine the RI/FS scope and to plan for the entire RI/FS. The RPM should avoid dealing with specific details of the site; they will be addressed in the post-AOC scoping task and beyond. By performing pre-scoping, the RPM will have a better understanding of the site characteristics. The RPM should gain a general idea of what information is needed, what activities should be performed, and, therefore, what is expected of the PRP throughout the RI/FS process.

2.3 TIMEFRAME

Once the support contractor has been procured, the remaining activities in pre-scoping should take a short period of time (for example, one quarter). The timeframe for pre-scoping will be dependent on the timeframe for activities among members of the oversight team that must be coordinated, the site complexity, and the availability of existing information.

2.4 HOW THE RPM PERFORMS "PRE-SCOPING"

The Model SOW and Model AOC contain specific tasks that need to be performed throughout the RI/FS process. In order to gather the background data for overseeing these tasks, the RPM should, at a minimum, perform the following activities. These activities can reduce the time spent to prepare for settlement negotiations, improve the likelihood of developing a usable site-specific SOW, and help to negotiate an AOC:

- Hire a support contractor;
- Begin coordination with State, Trustees and other Regional EPA divisions;
- Visit the site;
- Develop a general site management strategy;
- Incorporate EPA's program goal for the remedy selection process;
- Review the PRP's SOW; and
- Provide assistance to ORC in negotiating an AOC.

In addition, the RPM should assess the need for several ongoing activities. Each of the RPM's activities are discussed in the following sections.

Support Contractor

Hire a support contractor for technical assistance that includes the following:

- Start the procurement process early. First, the RPM should consider TES contractors, then ARCS contractors, State representatives, or designees from another Federal agency. The RPM should assure that the contractor period of performance covers the entire RI/FS process and allows for unexpected delays that can occur throughout the RI/FS.

Note: The contractor used for technical support should be checked for any conflict of intent, given a detailed work assignment, and, if acceptable, be the contractor secured for oversight of the entire RI/FS process.

- Review the prior work of the various support contractors available to the RPM. Check with other RPMs who have worked with these contractors.

- Request that the contractor gather existing site data. See Figure 2-1 for a list of some of the more important data sources that the support contractor should check; see Figure 2-2 for a site file -- established after the site's NPL placement and in which existing site data should be available -- overview. Typical existing data include the following:

  - Aerial and historical photographs;
  - Geophysical surveys;
  - USGS Topographic Maps;
  - Test cores;
  - USFWS National Wetlands Inventory Maps;
  - Well logs;
  - Soil Conservation Service soil surveys; and
  - Newspaper clippings.

- Have the support contractor develop a general conceptual model for the site. This model should contain a diagram and an explanation of site surface and any geological (hydrogeological) information, source areas, and potential exposures. (See "Getting Ready, Scoping the RI/FS" (OSWER Directive No. 9355.3-01FS1, November 1989), for an example of a conceptual model.)

Coordination

Begin coordination with State, Trustees, other Regional EPA divisions and request assistance from a TST to:

- Assure that the PRPs gather all necessary information pursuant to the Work Plan, as directed by the SOW; contact other EPA divisions (including Regional Counsel), the State, and Natural Resource Trustee and ascertain whether, in addition to the general requirements of the Model SOW, requirements associated with the site particulars need to be added.

Figure 2-1. Useful Sources of Existing Data

Federal Sources of Existing Data*	State Sources of Existing Data	Local Sources of Existing Data
• Preliminary Assessment/Site Inspection (PA/SI) • Hazardous Ranking Scoring (HRS) documentation • Agency for Toxic Substances and Disease Registry (ATSDR) health assessment • PRP search — Section 104(e) letters — waste-in list — data requests to the PRP • Records on removals and disposal practices • Permits for discharges — Toxic Release Inventory System (TRIS) • National Pollutant Discharge Elimination System (NPDES) • Prior Contract Laboratory Program (CLP) work • RCRA manifests, notifications, and permit applications and Section 3007 information requests • EPA databases (see Appendix A)	• EPA-equivalent agency • Public health agency • Planning board • Geological Survey • Fish and Wildlife Service • Historic Preservation Office • Natural Resource Department	• Public library • Chamber of Commerce • Public health department • Planning board • Town/city hall or court house • Water authority • Sewage treatment facility • Previous site employees/management • Well drillers • Residents near site • Universities (information on local areas) • Historical societies • Newspaper files

* *Other Federal agencies may also be able to provide data. These are noted on page 2-5.*

Figure 2-2. Overview of the Site File

Purpose:	The site file contains an accurate and complete documentation of all site activities, including records pertaining to the administration of the projects, reports, decision documents, and recoverable costs.
Location:	The site file is maintained in the Regions. For State-lead sites, the site file is kept in the State file location.
Contents:	PRP reports, oversight reports, oversight assistant reports, field activity reports, progress reports, and laboratory reports.
Access:	Each Region has procedures for opening, compiling, maintaining, closing, and storing the site file.

- Determine which characteristics of the site will require technical expertise to evaluate. This may include risk and exposure to human health and environment; soil contamination, leaching, and remediation; complex groundwater systems; topographic limitations; air emissions; mixtures of contaminants; sensitive or protective land use; preservation of natural resources and threatened or endangered species; State concerns more protective than Federal levels; and adverse impacts to the local economy.

- Choose appropriate TST members to address those areas of concern. These may include personnel from the following resources:

  - EPA Regional offices

    -- Environmental Services Division (ESD)
    -- Environmental Response Team (ERT)
    -- Waste Management Division (WMD)
    -- Water Division (WD)
    -- Air Division (AD)
    -- Public Affairs
    -- Office of Regional Counsel (ORC)

  - EPA National offices

    -- Office of Research and Development (ORD)
    -- National Enforcement Investigations Center (NEIC)
    -- Office of Enforcement, Superfund Division

  - Other Federal agencies

    -- ATSDR
    -- USCOE
    -- United States Geological Survey (USGS)
    -- United States Fish and Wildlife Service (USFWS)
    -- U.S. Department of Agriculture (USDA)
    -- NOAA
    -- DOD
    -- DOE

-- Health and Human Services (HHS)
-- Department of Justice (DOJ)

- States

  -- EPA-equivalent agency
  -- State Geological Survey (SGS)
  -- State Fish and Wildlife Service (SFWS)
  -- State Historic Preservation Office (SHPO)

- Contractors

  -- TES Contractors
  -- Lead-agency approved contractors.

Note: The TST will, at a minimum, require expertise in the following disciplines: engineering, geology, hydrogeology, toxicology, ecology, and meteorology. The TST also may require legal counsel from EPA (ORC and OE - Superfund Division) or DOJ. After choosing the experts, the RPM should have them identify any specific requirements needed in the SOW.

- Discuss the site in meetings with Regional managers and staff and with members of the TST to gain a general site understanding, including specific concerns of the Region/State and TST, which should be addressed in the site-specific SOW. The participants at these meetings will develop a general site management strategy to be used as a guide for planning future RI/FS activities.

Site Visit

Visit the site and nearby area with the support contractor and necessary members of the TST to accomplish the following:

- Observe the physical conditions and kinds of contamination that exist at the site. See Figure 2-3 for a checklist of physical conditions on which the RPM should focus. See Figure 2-4 for examples of site contamination. General factors that are critical to planning future RI/FS activities include:

  - Size of contaminated area (acres);
  - Present land use;
  - Surrounding area/sources/pathways;
  - Prior activities at site;
  - Number of known PRPs;
  - Proximity to populations both human and environmental; and
  - Proximity to sensitive areas.

  Also, if information is available:

  - Owner(s) and operators of site (existing/prior);
  - Generators of waste; and
  - Transporters of waste.

- Modify the SOW to address specific site needs. The RPM, with contractor support, must identify general information needs, areas where additional information will be needed (and how these areas will be covered in the site-specific SOW), and areas where additional data will not be needed.

Figure 2-3. Checklist of General Site Conditions (Page 1 of 2)

	Examine	Identify
Geology	Soil deposits (types, uses, contamination effects), bedrock (types, alterations, contamination effects), any remaining surface material (piles or mounds)	Surface contamination (subsurface contamination will likely be identified based upon existing data; a site visit will probably not provide evidence of subsurface contamination) Hot spots of contamination Limitations on site access Contaminant pathways
Topography	Landforms Erosion patterns Natural resources	Media contaminated Limitations on site access Locations for institutional controls Location of natural barriers to migration of contaminants Migration pathways off site
Meteorology	Effects of current weather Prior weather conditions (from existing data)	Extreme weather conditions (hurricane, tornado) Flooding Aridness Hot or cold periods Wind direction, if necessary
Land Use	Residential Industrial Agricultural Recreational Floodplain/wetland Lands administered by Federal, State, or local governments	Media contaminated Exposure routes Locations for institutional controls Limitations on site access Location of natural and manmade barriers Migration pathways off site
Vegetation	Plant communities (types, use, contamination effects) Threatened or endangered species Protected areas and sensitive ecosystems	Effects of contamination (on vegetative strata, floral diversity, and food production) Threatened or endangered species Hot spots of contamination Placement of institutional controls or natural barriers Migration pathway off site

Figure 2-3. Checklist of General Site Conditions (Page 2 of 2)

	Examine	Identify
Wildlife	Terrestrial and aquatic habitats, including bird refuges or protected areas	Effects of contamination (on wildlife habitats or migratory areas) Threatened or endangered wildlife Transport of contamination off site by wildlife Locations for institutional controls Limitations on certain remedial actions
Water Resources	Water collection areas Surface waters (including wetlands) Floodplain Location of all potable water supplies (drinking and industrial usage) Availability of alternate water supplies Location of septic tanks	Effects of contamination on standing and flowing water (i.e., fresh water, salt water, or brackish water) Users of the water resources Limits on locations of institutional controls
Air Quality	Areas with unusual or foul odors	Prevailing wind direction Precautions for site workers Receptors when wind direction changes Contamination transport through air
Manmade Features[1]	Road access Railroads Power lines Pipelines Water wells Bridges	Prior environmental assessment (EA) or environmental impact statement (EIS) Effects of contamination on manmade features Limitations on site access Limits on locations for institutional controls Precautions for site workers Physical limitations on certain remedial actions

1 *After the site visit, the RPM should contact the appropriate agency responsible for regulating the construction or maintenance of this feature.*

Figure 2-4. Basic Description of Contamination

Media of Concern	Common Types of Site Categories	Common Sources	Common Pathways	Basic Receptors
• Ambient air • Containerized waste • Ground water* • Sludge and slurry • Soils (surface and subsurface, water and vapor)** • Surface water	• Asbestos • Battery/lead recyclers • Dioxins • Landfills - *Industrial* - Municipal • Metals • Metals/organics • Mining wastes • Mixed waste / radioactive • Multi-source ground water • Munitions/explosives • Organics • PCBs • Pesticide manufacturing • Plating metals • Solvents • Wood preservatives	• Buildings/storage areas • Containers/drums • Dry wells • Holding tanks • Industrial/chemical manufacturing processes • Waste pits/pools • Landfills	Human • Ingestion of soils • Ingestion of groundwater • Ingestion of fruits and vegetables • Ingestion of fish and meat • Inhalation of vapors • Inhalation of particulates Terrestrial • Contact with surface water, vegetation, air, and soil Aquatic • Contact with surface water and sediments	• Industrial workers • Recreational users • Residents • Vegetation • Wildlife

* *Without prior knowledge or well data, this will not be determined at this time.*

** *Cannot be determined by site visit only.*

Site Management Strategy

After performing these activities, the RPM (with contractor support) should devise a general site management strategy to be used for planning purposes. Devising this strategy should not be time consuming, but should include a preliminary list of site objectives. The site strategy may define the following elements:

- Surface and subsurface (if known) extent of contamination and contaminants of concern affecting soil, surface water, sediment, air, and groundwater and subsurface structures (if known), plus the amount of solid wastes, liquid wastes, and sludges.
- Exposure routes and receptors that may result in exposure concentrations greater than the ARARs, greater than 10^{-6} excess cancer risk, or a hazard quotient greater than 1.
- Site remediation goals based on ARARs (including maximum contaminant levels (MCLs)), risk-based concentrations, or nonpromulgated Federal or State criteria, and advisories (i.e., guidance to-be-considered (TBCs).
- Initial site data needs and potential areas of concern, such as site characteristics; media affected; conditions of contaminants (that is, source, type, pathways for transport, and receptors) posing present and potential risks; and number of operable units, if necessary.

Note: The oversight team (RPM, Regional experts, TST, States, and Trustees) should identify any data gaps in the existing site data. Some of the data gaps will be filled during site characterization. Other data gaps, however, may be so large that the PRP will need to perform a limited field investigation even before beginning to develop a Work Plan. The results of this field investigation should be included in post-AOC scoping during the development of the PRP's Work Plan and SAP.

Program Goal

Consider EPA's program goal, management principles, and expectations from the NCP in the site management strategy, and during future RI/FS and selection of remedy activities. (See Figure 2-5.)

PRP SOW

After providing a Model SOW to the PRP for use as a guide, review the PRP's SOW or Work Plan for accuracy, completeness, and site-specific information, if available, regarding the proposed activities.

Note: The availability of site information at the time of pre-scoping will determine the level of detail in the SOW. At sites where little information exists, site specifics will not be included until the post-AOC Work Plan. (See Chapter 3.)

The AOC

Assist ORC attorney to negotiate and sign an AOC with the PRP. The Model AOC (OSWER Directive No. 9835.3-1A, January 30, 1990) should be used as a guide to ensure completeness of the negotiated AOC. The AOC should describe: general and site-specific activities to be performed, to the extent known; roles and responsibilities of those who will perform these activities; a schedule the PRP and EPA will follow during the RI/FS; and deliverables the PRP is expected to submit to EPA; and procedures for notifying PRPs and, if

Figure 2-5. Program Overview

Program Goal

- The national goal of the remedy selection process is to select remedies that will be protective of human health and the environment, maintain protection over time, and minimize untreated waste.

Program Management Principles

- Sites should be remediated in operable units when early action is necessary, or phased analysis or response is necessary to expedite cleanup.
- Operable units should be consistent with, and not preclude, implementation of the final remedy.
- The scope and complexity of the site should be reflected in the data needs, evaluation of alternatives, and documentation of the selected remedy.

Program Expectations

- Principal threats posed by a site will be treated, if practicable, with priority placed on treating waste that is highly toxic, highly mobile, or liquid.
- Engineering controls will be utilized for wastes posing relatively low long-term threat, or where treatment is impracticable.
- Institutional controls will be utilized to supplement engineering controls, as appropriate, and should not substitute for active response measures as the sole remedy.
- Contaminated ground waters will be returned to beneficial uses whenever practical, within a reasonable time, given the particular circumstances of the site.
- A combination of treatment, engineering, and institutional controls will be used, as appropriate, to protect human health and the environment.
- Innovative technologies will be considered when such technologies offer the potential for superior treatment performance, fewer or less adverse impacts than other approaches, or lower costs for performance similar to that of demonstrated technologies.

Note: Source — The National Contingency Plan, 40 CFR 300.430(a) (1)

necessary, EPA counsel of noncompliance and for dispute resolution. (See the Enforcement Project Management Handbook for details on RI/F- negotiations/settlements.)

Ongoing Activities

Throughout the pre-scoping process, the following ongoing activities could be performed:

- Conduct PRP search activities. The RPM should coordinate the conduct of PRP searches into the planning of future RI/FS activities. Since additional PRPs can be identified at any time during the RI/FS process, the activity plans should be flexible enough to allow activities to be changed with only a minimum amount of advance warning. (See the Enforcement Project Management Handbook for details on RPM activities during the conduct of a PRP Search.)

- Consider the need for performing interim remedial or removal actions to stabilize the site or address a short-term threat while a final remedial solution is being developed. The RPM must be able to review the existing site information and look for clues to suggest that an interim or removal action will be required. Such actions may be needed to prevent contaminants from migrating off site. Communications with other Regional technical experts, States, local governments, and the public will help the RPM locate these clues.

- Consider dividing the site into operable units. The RPM may determine that acquiring specific information on one operable unit (that is, one particular media or source) may be helpful in planning activities for the entire site. Although the breakup of a site into operable units may extend the time to conduct an RI/FS, it may be necessary to focus the investigation on one operable unit in order to gather the information necessary to address all future media of concern.

Note: The process of dividing a site into operable units is determined by each Region. The RPM should consult their Regional managers for assistance on designating operable units for a site.

2.5 FOR FURTHER INFORMATION

Current References

- National Contingency Plan (NCP), 40 CFR 300.430(a).
- Guidance for Conducting RI/FS Under CERCLA, OSWER Directive No. 9355.3-01, October 1988, (See Appendix A).
- Getting Ready, Scoping the RI/FS, OSWER Directive No. 9355.3-01FS1, November 1989.
- Interim Guidance on PRP Participation in RI/FS, OSWER Directive No. 9835.1a, May 16, 1988.
- Enforcement Project Management Handbook, OSWER Directive No. 9837.2-A, January 1991.
- Model Statement of Work for RI/FS Conducted by PRPs, OSWER Directive No. 9835.8, June 2, 1989.

- Model Administrative Order on Consent for RI/FS, OSWER Directive No. 9835.10, January 30, 1990.
- Interim Guidance on Notice Letters, Negotiations, and Information Exchange, OSWER Directive No. 9834.10, October 19, 1987.
- Potentially Responsible Party Search Manual, OSWER Directive No. 9834.6, August 1987.

Future Resource

- Annotated Technical Reference for Hazardous Waste Sites (OWPE) (Projected for Publication in 1991).

2.6 RESOURCES AVAILABLE TO RPMS

Personnel

- Support contractor.
- Regional staff (TST, ORC, ESD).
- States (Environmental Agency, Health Department, SGS, SFWS, SHPO).
- Experts (ORD, other Federal agencies, counties and local sources, universities).

Documents

- Model SOW.
- Model AOC.

Data

- Existing site data.
- Region's reference library for similar sites.
- RODs database.
- Chronological logbook of meetings and site visit.

2.7 HELPFUL HINTS FOR THE RPM

During pre-scoping, the RPM should anticipate causes for potential project delays, including the following:

- The quality of the support contractor's work, which will determine if this contractor is to be used as the oversight assistant for the entire RI/FS;
- Areas where limited information exists, but for which data will be needed before performing future tasks of the RI/FS;
- Areas of expertise lacking in the TST; and
- Site-specific concerns presented by the TST that have not been included in the SOW.

To help minimize the time spent on pre-scoping, the RPM can take the following actions:

- Use general conceptual models and save specific details for the Project Plans during post-AOC scoping;
- Tailor the SOW with specific concerns to the extent known (additions or deletions) from the Regional/State experts and the TST;
- Establish PRP financial and technical qualifications prior to the AOC;
- Provide the support contractor with a well-defined work assignment to assure good performance of the pre-scoping activities; and
- Record the support contractor's activities and all RPM decisions in a chronological logbook to prevent duplication of effort and to provide adequate documentation of activities.

CHAPTER 3

POST-AOC SCOPING

3.1 INTRODUCTION

Post-AOC scoping is the detailed, site-specific activity planning phase of the RI/FS during which Project Plans are developed. It occurs after negotiations are completed and an AOC, with a SOW, has been signed by EPA and the PRP. During post-AOC scoping, the RPM refines the oversight team's site conceptual model, preliminary site objectives and remediation goals, and preliminary data needs. This information is used to assist the PRP to develop a set of usable Project Plans. Based on the evaluation of existing site data, the RPM reviews, comments on, and approves the Project Plans submitted by the PRP, with support from TST members and an oversight assistant (probably the support contractor used during pre-scoping).

3.2 PURPOSE AND GOAL FOR THE RPM

The RPM establishes the foundation during post-AOC scoping for oversight of the entire RI/FS process. During post-AOC scoping, the RPM, with support from the oversight assistant and TST members, works with the PRP to develop the PRP's Project Plans, which include the specific data needs for the site. The Project Plans establish procedures for PRP performance of field activities, laboratory testing, and data analysis, in order to characterize the site. Post-AOC scoping is designed to develop PRP Project Plans - Work Plan, Sampling and Analysis Plan (SAP), and Health and Safety Plan (HSP) - which must be approved prior to initiation of field activities. During post-AOC scoping, the RPM is responsible for developing community relation activities and for drafting a Community Relations Plan (CRP).

3.3 TIMEFRAME

The PRP Project Plans should be developed within three to six months after signature of the AOC. Gaps in the existing data and resubmittals may extend this period. The timeframe for post-AOC scoping will be determined by extent of existing site data, complexity of site characteristics, kinds of contaminants, coordination within EPA and with State and Natural Resource Trustees, completeness of EPA instructions to PRPs, and the ability and willingness of the PRP to develop acceptable Project Plans.

3.4 HOW THE RPM OVERSEES POST-AOC SCOPING

The PRP Project Plans contain detailed information that summarizes the existing data. In addition, the plans identify the work to be performed, including methods, rationale, schedules, data reporting requirements, equipment verification, and QA/QC concerns.

The PRP Work Plan and SAP expands on the activities identified in the SOW and includes a site conceptual model, preliminary site objectives (including preliminary remediaiton goals (PRGs) identified by EPA) and preliminary data needs. (Each of these items will be compared to its counterpart prepared by

the oversight team and appropriate revisions to the PRP Work Plan will be made.) The PRP Work Plan and SAP also includes a documented and detailed sampling plan, a preliminary list of alternatives, documentation of the need for treatability studies, whether the PRP satisfies/or will need to obtain a waiver of ARARs, and procedures to acquire additional data when unknown contaminants are discovered. (See RI/FS Guidance Appendix B.)

An efficient way to develop an acceptable PRP Work Plan and SAP is to have a set of Regional Standard Operating Procedures (SOPs) in place before the scoping phase. These SOPs should describe the types of activities that may be required, identify the party responsible for performing these activities, determine the format to document the results of these activities, and assure that the data collected satisfy EPA's standards for quality data. SOPs may be modified by site-specific circumstances. At a minimum, SOPs need to address the following:

- Handling and disposition of RI/FS wastes (that is, soil cuttings, drilling muds, extracted groundwater, decontamination or cleaning liquids, and protective clothing);
- Drilling method and sampling method;
- Method for sampling an aquifer;
- Well screen intervals;
- Frequency of sampling intervals during drilling;
- Method of surface water sampling, if necessary; and
- QA/QC protocols for non-contract laboratory program (non-CLP) labs (local or mobile labs).

The RPM (with appropriate support from the oversight assistant and TST members) must assure that the PRP develops acceptable Project Plans. The RPM's activities are specified below.

Note: These activities are based on the assumption that the oversight assistant during post-AOC scoping is the same as the support contractor used in pre-scoping. If a new contractor must be procured to assist in oversight, the RPM needs to issue a separate Oversight Work Assignment, and receive and approve a separate Oversight Work Plan.

Kickoff Meeting

Conduct a kickoff meeting with the PRP (including oversight assistant and TST members) and, if necessary, conduct a site visit. Prior to the meeting, the RPM will provide guidance documents to the PRP on the RI/FS process including roles and responsibilities, activities to be performed, and schedule for deliverables and activities. (See the references listed in Section 2.5 and in each RI/FS discussion task of this manual.) During the site visit, the RPM and PRP representative evaluate the present site condition and discuss conduct of the future RI/FS activities. A summary of the kickoff meeting is provided in Figure 3-1.

Figure 3-1. Summary of a Kickoff Meeting

PURPOSE:	This planning meeting is primarily for ensuring that all parties are familiar with the full scope of site activities and with EPA expectations.
TIMEFRAME:	The kickoff meeting is conducted soon after the AOC is signed and prior to the development of the Work Plan or other plans.
PARTICIPANTS:	The RPM, oversight assistant, and TST members should meet with the PRP's project manager and other project supervisory personnel (including appropriate contractors). Regional management, and State and local officials may also attend.
TOPICS:	The kickoff meeting should discuss the following: administrative matters, such as point of contact; EPA and PRP roles and responsibilities; project schedule for meetings and activities; preliminary field procedures, such as site requirements, locations of work areas, decontamination areas, clean areas; potential need for emergency equipment; and deliverables expected of the PRP.
PREPARATION:	Prior to the kickoff meeting, the RPM should review the procedures for sampling and well drilling activities for different types of media. See Appendices B and C in Volume 2 of this guidance.

Regional Management Meeting

Conduct a Regional management meeting to review the following:

- Schedule of activities identifying what will be done, who will do it, and when will it be done;
- Ways to attain EPA's objectives and goals through PRP performance of the planned activities;
- Budget for activities, personnel, and resources to be used during the RI/FS;
- Data to be included in PRP Project Plans - content and requirements, specific data needs, data accuracy, and data completeness; and
- Status and level of communication with State representative, ATSDR, Natural Resource Trustee, and the public.

State ARARs

Request, in writing, that the State prepare and submit a list of State ARARs to the lead agency for review. The RPM should ask for advance notice of State ARARs that may be more stringent than the comparable Federal ARARs.

Laboratory Facility

Notify the PRPs' chosen CLP facility of how the CLP will be used during field sampling (either primary testing or oversight of split samples). Verify the capability of the PRPs' chosen non-CLP facility (qualified mobile or local laboratory), which must adhere to CLP protocols for sampling. The RPM should review each laboratory's procedures - personnel, equipment, detection levels, routine analytical sampling (RAS), and special analytical sampling (SAS) - to satisfy EPA's QA/QC concerns.

Work Plan Review

After the PRP has submitted any portion of the draft Work Plan for review (for example, site background summary and history of the site; comprehensive description of activities including methods, schedule, and rationale; a site conceptual model; and the PRPs' plan to identify the need for additional data when data gaps or site unknowns exist), meet with the oversight assistant and TST, to review and verify the following items in the PRP's submittal:

- Remedial action objectives and preliminary remediation goals (PRGs) and the methods and rationale for meeting these objectives and goals;

- Initial list of remedial alternatives - a range of alternatives, as appropriate, that includes a no-action alternative, treatment alternatives to reduce the toxicity, mobility, or volume of waste (see Section 2.5), containment alternatives which include engineering and institutional controls (see Section 2.6), or a combination of treatment and containment options; and

Note: A full range of alternatives may not be appropriate for each site. (See the NCP, 40 CFR 300.430(d).) Screening the initial list of alternatives for grossly excessive cost, effectiveness, and implementability may reduce the number of potential alternatives to be considered by the RPM throughout the RI/FS process.

- Preliminary list of Federal ARARs. (See the preamble to the final NCP, 40 CFR 300.430(a), pp. 8764 - 8766.) During post-AOC scoping, the PRP should identify only chemical-specific and location-specific ARARs; action-specific ARARs will usually be identified during the screening of alternatives in the FS (see Chapter 7).

  For further information and guidance on ARARs, see:

  - The Preamble to the NCP, 55 Federal Register 8741-66 (March 8, 1990), and 53 FR 51435-47, December 27, 1988.

  - "CERCLA Compliance With Other Laws Manual," EPA/540/G-89/006, August 1988.

  - "CERCLA Compliance With Other Laws Manual, Part II. Clean Air Act and Other Environmental Statutes and State Requirements," EPA/540/G-89/009, August 1989.

- Explanation for the candidate technologies to be used during the treatability studies task. The RPM should access ORD's Superfund

Innovative Technology Evaluation Program (SITE) to review the demonstrated and emerging technologies that may be currently available for certain remedial actions (see Section 2.5) and the Alternate Treatment Technology Information Center (ATTIC) Database System (see Appendix A).

PRP Project Plans

Review the draft and final PRP Project Plans (Work Plan, SAP, and HSP). Verify that these PRP deliverables meet EPA's requirements for the Work Plan and SAP, address site-specific concerns, contain accurate analyses and conclusions, and include justifications for performing all future field activities.

Note: The RPM has three choices after reviewing the PRPs' Work Plan and SAP: approval, disapproval, and approval on condition. Reasons for disapproval and conditions for approval should be explicitly explained by the RPM to the PRP.

Cost Recovery Documentation

Develop an ongoing cost recovery documentation program that contains at a minimum:

- RPM costs including personnel hours and travel;
- Contractor costs charged to the site;
- Any other direct costs charged to the site (for example, TST activities); and
- A complete set of detailed records (written documentation) that describe the oversight activities.

A summary of the cost recovery documentation process is provided in Figure 3-2.

Natural Resource Trustee

Notify the appropriate Natural Resource Trustee by letter to determine the need for performing a preliminary Natural Resource Survey. This may include a Federal Trustee - DOI, NOAA, USDA, DOD, or DOE; State Trustee designated by the Governor; or both Federal and State Trustees.

Note: It is the Trustee's responsibility, not the RPM's, to decide if and when to conduct a Natural Resource Survey during site characterization.

Community Relations

Determine the necessary community relations activities and develop a CRP with the Regional Community Relations Coordinator. Even though EPA is responsible for community relations activities, the PRP may participate in such activities. The RPM (or designee) should inform the public of the content of the approved PRP Project Plans and proposed site activities.

Administrative Record File

Open the Administrative Record File when the Project Plans are approved. A summary of the Administrative Record is provided in Figure 3-3.

Figure 3-2. Summary of Cost Recovery Documentation

PURPOSE: Accurate and complete documentation describing oversight site activities and costs incurred is essential to ensure recovery of EPA's oversight costs.

LOCATION OF DOCUMENTATION: Records and documentation are filed in the EPA active site file that is maintained in the Region's Record Center or in State active files in the case of State-lead sites.

CATEGORIES OF EXPENDITURES: CERCLA § 104(a) provides that PRPs conducting an RI/FS must agree to reimburse the Fund for any costs incurred by EPA under, or in connection with, an oversight contract or arrangement. Recoverable oversight costs include but are not limited to:

- EPA personnel (salaries and benefits), administrative, and site travel costs, including associated indirect costs.
- Direct and associated contractor and EPA indirect costs of contracts or other arrangements for oversight assistance.
- Costs of compiling cost documentation to support the demand for reimbursement.
- Accrued interest on the above costs.

The AOC must address oversight reimbursement and provide a schedule of payments. The billing and reporting of these costs can be facilitated through use of the oversight Site Information Form (SIF) which is on the CERCLIS menu. Information concerning the incurrence and reimbursement of oversight costs should be entered into CERCLIS in a timely manner along with related site information as it develops.

RESPONSIBILITIES: With regard to the documentation of such costs, the Cost Documentation Management System (CDMS) is the primary tool for summarizing costs. This system draws on the Integrated Financial Management System (IFMS) and presents costs in summary form which can be used to document costs for billing purposes pursuant to the AOC. The CDMS summaries are also useful in cost recovery negotiations and litigation.

The use of this system is the joint responsibility of the Financial Management Office (FMO) and the Cost Recovery Program staff in the Waste management Division (WMD) of the Region. The ORC uses the CDMS outputs in negotiations and litigation.

EPA Financial Management Offices (FMOs) in Headquarters, Regions, and other field offices (e.g., RTP) are primarily responsible for compilation of cost documentation. The Regional Cost Recovery

Figure 3-2. Summary of Cost Recovery Documentation (continued)

RESPONSIBILITIES (continued)	Program staff is responsible for preparing a cost recovery checklist that identifies the site, status, period for which documents are needed, types of documents, and appropriate ORC and Program contacts to assist the FMOs in this compilation. The Program staff is also responsible for ensuring the completeness and technical accuracy of the cost documentation packages produced by the FMO. The ORC is responsible for identifying documents protected by the Privacy Act and by EPA's Public Information regulations (40 CFR Part 2), as well as documents that may be enforcement confidential or otherwise privileged. The ORC may prepare affidavits for the FMOs to attest as fact witnesses as to the authority and content of EPA documents.
ASSISTANCE:	For further information relating to documentation of oversight activities or related recoverable costs, contact your Regional Cost Recovery Program Chief, your Regional FMO or Superfund Financial Officer (SFO), or the Chief, Cost Recovery Branch, CED, OWPE, OS-510W, (703) 308-8454 or FTS 398-8454.

Ongoing Activities

Throughout the post-AOC process, the following ongoing activities need to be performed:

- Amend Project Plans. Each element of the Work Plan and SAP may not be known at post-AOC scoping. Field activities, such as Baseline Risk Assessment and treatability study requirements, may need to have separate Work Plans to be incorporated into the existing, flexible Work Plan. Non-field activities, such as identifying action-specific ARARs, may also change the scope of the Work Plan and SAP.

- Conduct project status meetings. The RPM, oversight assistant, and TST members should meet with the PRPs and their field supervisory personnel regularly to discuss the content of the Project Plans, make changes to the schedule, as needed, and identify problem areas early. Some problems may be avoided by acquiring the needed access to the site, mobilizing necessary field equipment, looking out for unexpected site conditions, discussing proposed activities with the community, reviewing the capabilities of personnel and equipment of the PRP proposed laboratory, verifying that the sampling data and monitoring well placement will acquire quality data, and committing the PRPs to a workable schedule of draft and final deliverables.

- Decision to divide project into phases. The RPM, oversight assistant, and TST members may agree in post-AOC scoping that the PRP perform a sampling event on one operable unit with hopes that the data obtained will help provide a better understanding for future sampling events or other operable units. The number of phases, however, may be amended at any time as additional data on the site become known.

Figure 3-3. Summary of Administrative Record File

PURPOSE:	The Administrative Record File contains documents that may form the basis for EPA's selection of response actions. This File provides documentation of the basis for Agency action if EPA decisions are challenged, and provides the public an opportunity to review and comment on site activities and plans.
MAINTENANCE:	The Administration Record File is maintained by the Regional (or State) office.
CONTENT:	The Administrative Record File should include factual information and data that may form the basis for the selection of a response action; including reports on the site response activities; policy and guidance documents relevant to the site, (as contained in the OSWER "Compendium of CERCLA Guidance Documents Used for Selection of CERCLA Response Actions") public participation documentation; information from parties outside EPA, such as documentation of State involvement, ATSDR health assessment or reports by Trustees; enforcement documents pertaining to response selection; public comments; and decision documents.
FOR FURTHER INFORMATION	See "Final Guidance on Administrative Records for Selecting CERCLA Response Actions" (OSWER Directive No. 9833.3A-1, December 3, 1990).

3.5 DELIVERABLES DURING POST-AOC SCOPING

The Project Plans are the first deliverables submitted by the PRP to the lead agency. The lead agency will review and approve the PRPs' Work Plan and SAP, and only review and comment on the PRPs' HSP. The minimum requirements for each of these deliverables are contained in Figure 3-4.

Work Plan Content

A PRP RI/FS Work Plan should at a minimum contain a comprehensive description of the five areas (see RI/FS Guidance, Chapter 2 and Appendix B in Volume 2) discussed in the following sections.

Introduction

The introduction to the Work Plan should provide a general explanation of the objectives for performing the RI and FS and the goals to be achieved during each portion of the process. The PRPs should discuss the activities to be performed, the deliverables to be submitted, and the schedules for performing activities and submitting deliverables.

Figure 3-4. Elements of Project Plans

Elements of a Work Plan

- A comprehensive description of the work to be performed, the information needed for each task, the information to be produced during and after each task, and a description of work products submitted to the RPM *(see RI/FS Guidance, Chapter 2 and Appendix B, and the Enforcement Project Management Handbook, RI/FS Implementation Chapter);*
- The methods that will be used during each activity *(see RI/FS Guidance Appendix B, and Section 1.7 of this manual on QA/QC);*
- A schedule for completing activities *(see timeline in Figure 1.5 and activities checklist in the Enforcement Project Management Handbook, RI/FS Implementation Chapter);*
- The rationale for performing or not performing an activity *(see RI/FS Guidance Appendix B, and the Enforcement Project Management Handbook, RI/FS Implementation Chapter);*
- A site background summary and history of site *(see the Pre-PRP Negotiation Task in Chapter 2);*
- A site conceptual model *(see the Pre-PRP Negotiation Task in Chapter 2);*
- An identification of preliminary site objectives which includes preliminary remediation goals *(see Chapter 2 of this manual);*
- The need for additional data when future site unknowns are identified *(see Model SOW, Task 1, and the Enforcement Project Management Handbook, RI/FS Implementation Chapter);*
- The manner of identifying Federal and State ARARs *(see the Post-AOC Scoping Task in Section 2.2 and the Development and Screening of Alternative Task in Chapter 3);*
- An identification of preliminary alternatives *(see Chapter 3 of this manual)* and RI / FS guidance; and
- A plan for meeting treatability study requirements *(see Chapter 6 of this manual).*

Elements of the Health and Safety Plan *(Lead Agency Supplies Comments Only)*

- Identification of the site health and safety officer, key personnel, and alternates, for site health and safety;
- The risk analysis for existing site conditions, each site task, and operation;

Elements of the Health and Safety Plan (Continued)

- Employee training assignments;
- A description of personal protective equipment and an identification of those operations when it will be used;
- Medical surveillance requirements;
- The frequency and types of monitoring, personnel monitoring, and environmental sampling techniques and instrumentation;
- Site control measures;
- Decontamination procedures;
- Standard operating procedures for the site;
- A contingency plan that meets the requirements of 29 CFR 1910.120(1)(1) and (1)(2); and
- Entry procedures for confined spaces.

Elements of the Sampling and Analysis Plan

Quality Assurance Project Plan (QAPJP)

- Sampling procedures, sample custody procedures, analytical procedures, data reduction, data validation, data reporting, and personnel qualifications *(see Chapters 1 and 3 in Volume 1, and Appendices B and C in Volume 2 of this manual);*
- The qualifications of each laboratory to conduct work *(Note: If a laboratory selected is not in the Contract Laboratory Program (CLP), the non-CLP lab's methods must be consistent with CLP methods in order to satisfy EPA's QA/QC procedures) (see Chapter 1 of this manual); and*
- The use of internal controls, such as unannounced site, performance, and system audits *(see Section 1.7 of this manual).*

Field Sampling Plan (FSP)

- The sampling objectives, sample locations and frequency, sampling equipment and procedures, and the program for sample handling and analysis *(see Section 1.7 in Volume 1, and Appendices B and C in Volume 2 of this manual).*

Site Background and Physical Setting

The site background and physical setting section should describe current site conditions, site history, and available existing site information.

Initial Evaluation

The initial evaluation should provide a site conceptual model, which contains EPA's assessment of the site's current and potential risks to human health and the environment, exposure pathways, and current and potential routes of migration of the contaminants of concern.

Work Plan Rationale

The Work Plan rationale should provide an explanation and illustration of how the data needs will satisfy the oversight team's preliminary site objectives, especially an EPA-conducted risk assessment, and the preliminary list of alternatives. This Section will incorporate the site-specific concerns that are included in both parts of the SAP - the Field Sampling Plan (FSP) and the Quality Assurance Project Plan (QAPjP).

Note: Regions that have devised SOPs and generic QAPjPs can save substantial time during Project Plan development.

RI/FS Tasks

The RI/FS task discussions should describe the activities to be performed during scoping, site characterization (including EPA's (or PRPs', if an AOC was signed before June 21, 1990) Baseline Risk Assessment and treatability studies), and the development and analysis of potential alternatives. The site-specific items identified in the SAP (both FSP and QAPjP) should also be included in the discussion of the activities for each task (see RI/FS Guidance Appendix B).

SAP Content

A PRP SAP should contain a QAPjP and an FSP to ensure that the proposed sampling data collection activities are compatible with previous data collection activities and serve as a mechanism for the PRP to acquire EPA quality data. (See RI/FS Guidance, Chapter 2 and the "Compendium of Superfund Field Operations Methods" (OSWER Directive No. 9355.0-14, August 1987).)

Project Plans and the Baseline Risk Assessment

Depending upon the existing site data and the complexity of the site, the PRP Work Plan and SAP may not fully address EPA's Baseline Risk Assessment (or PRP assessments started *prior to* June 21, 1990) and treatability studies. When the RPM determines that these activities will be needed, an amended or separate Work Plan and SAP will have to be developed by the PRP and approved by EPA. (For further information see Baseline Risk Assessment in Chapter 5 and treatability studies in Chapter 6 of this guidance.)

Project Plan Progress Reporting

The progress of the RI/FS study should be compared to the anticipated progress as presented in the Work Plan, and reported monthly. At a minimum, progress reports should: (1) describe the actions that have been taken to comply with the AOC; (2) include all results of sampling and tests and all other data received from PRPs; (3) describe the work planned, specific work schedules, and relationship to the overall project schedule for completing the RI/FS; and (4) describe all problems encountered, any anticipated problems or delays, and any solutions to address these problems or delays.

Questions for Project Plan Review

The RPM, with help from the oversight assistant and members of the TST, should make sure that the Project Plan data and analyses answer the following questions:

- Work Plan and Sampling and Analysis Plan (SAP)
  - Are the plans consistent with the NCP, EPA guidances, and the activities, schedules, and procedures listed in the AOC and SOW?
  - Has the RPM supplied the PRP with appropriate EPA guidance documents and, if available, SOPs?
  - Do the plans contain the minimum required data to meet the activities checklist in the Enforcement Project Management Handbook or Figure 3-4 of this manual?
  - Do the plans address and provide resolution of site-specific concerns of the oversight team (RPM, oversight assistant, TST, and States) especially regarding EPA's risk assessment?
  - Do the plans include activities and objectives that are sufficiently broad to include the need for future data and activities, fill in the existing data gaps, and handle all types of delays due to natural and physical events?
  - Is it clear who will perform each activity, how the activity will be performed, what information will be needed prior to each activity, and what information will be produced at the conclusion of each activity?
  - Will the planned activities meet technically accepted engineering procedures, CLP protocols, and QA/QC concerns?
- Health and Safety Plan (HSP)
  - Does the plan meet the Occupational Safety and Health Administration (OSHA) requirements for worker safety?
  - Does the plan contain each of the required elements, as shown in Figure 3-4?
- Other Deliverables: Progress/Status Reports
  - Will the PRP and oversight assistant submit biweekly or monthly status reports on the portions of the Project Plans that will involve potential areas of disagreement regarding the site characteristics or contaminants?

3.6 FOR FURTHER INFORMATION

- National Contingency Plan (NCP), 40 CFR 300.430(a).
- Guidance for Conducting RI/FS Under CERCLA, OSWER Directive No. 9355.3-01, October 1988, (Chapter 2 and Appendix B).
- Interim Guidance on PRP Participation in RI/FS, OSWER Directive No. 9835.1a, May 16, 1988.

- Getting Ready, Scoping the RI/FS, OSWER Directive No. 9355.3-01FS1, November 1989.
- Scoper's Notes, An RI/FS Costing Guide, EPA/540/G-90/002, February 1990.
- Enforcement Project Management Handbook, OSWER Directive No. 9837.2-A, January 1991.
- Data Quality Objectives for Remedial Response Activities, OSWER Directive No. 9335.0-7B, March 1987.
- CERCLA Compliance With Other Laws Manual (ARARs): Interim Final OSWER Directive No. 9234.1-01, August 8, 1988.
- CERCLA Compliance With Other Laws Manual: Part II. Clean Air Act and Other Environmental Statutes and State Requirements, OSWER Directive No. 9234.1-02, August 1989.
- Interim Guidelines and Specifications for Preparing Quality Assurance Project Plans, U.S. EPA, Office of Exploratory Research, QAMS - 005/80, December 1980.
- A Compendium of Technologies Used in the Treatment of Hazardous Wastes, EPA/625/8-87/014, September 1, 1987.
- A Compendium of Superfund Field Operations Methods, OSWER Directive No. 9355.0-14, August 1987.
- Occupational Safety and Health Guidance Manual for Hazardous Waste Site Activities, NIOSH/OSHA/USCG/USEPA, 1985.

3.7 RESOURCES AVAILABLE TO THE RPM

Personnel

- Oversight Assistant.
- Technical Support Team (TST).
- Regional Staff (Peer Review, Management Review, ESD, ORC, and ORD).
- Headquarters Staff (OWPE, OGC, OE - Superfund Division).
- Other Federal Agencies (ATSDR, USCOE, Natural Resource Trustees).
- State Representatives.
- CLP and non-CLP Laboratories.

Documents

- PRP Site Conceptual Model.
- PRP List of Data Quality Objectives (DQOs).
- PRP List of Federal and State ARARs.

- PRP List of Treatment Technologies.
- PRP List of Potential Remedial Alternatives.
- PRP Draft and Final Project Plans (Work Plan, SAP, HSP).

Data

- Existing data from PRP Search, PA/SI, other Federal, State, and local sources.
- Site visit notes.
- Comments on the contents of Project Plans from members of the TST, other Federal agencies, and States .
- Estimate of site costs using the Cost of Remedial Action (CORA) Model or the Site Cost Estimation and Evaluation Study (SCEES) Database, which are available in each Region.
- Results of any limited field investigation.

3.8 HELPFUL HINTS FOR THE RPM

To avoid project delays during post-AOC scoping, the RPM should:

- Set up a network to communicate regularly with the oversight assistant and with members of the TST;
- Determine the ability of the PRPs (and PRPs' contractor) to perform the post-AOC scoping activities and verify the capability of the PRP to perform future RI/FS tasks;
- Discuss special site concerns and peculiarities with the oversight assistant and the TST (including State);
- Check the format, activity schedules, data documentation, and data completeness and accuracy of the Project Plans;
- Verify that the Project Plans will describe the site characteristics, the site contaminants, the risks to human health and the environment and the nature and extent of contamination (unless EPA is performing the Baseline Risk Assessment); and
- Identify areas where additional data will be required as well as areas which will not need to be addressed because of site type, contaminant type, or nature of the operable unit.

To help minimize the time spent on post-AOC scoping, the RPM can:

- Provide guidance documents to the PRP early in post-AOC scoping regarding all phases of the RI/FS process;
- Allow time in the schedule for review and comment (by RPM, oversight assistant, and TST) and PRP resubmittal of deliverables;

- Document information obtained from the oversight assistant, from the PRPs, and from site visits;
- Specify level of detail and content of PRP Project Plans early, preferably during kickoff meeting;
- Alert Natural Resource Trustees;
- Open the Administrative Record File at the end of post-AOC scoping; and
- Notify the public via meeting or fact sheet of the planned field activities.

CHAPTER 4

SITE CHARACTERIZATION

4.1 INTRODUCTION

The site characterization task seeks to gather sufficient data to define the site risks, to evaluate alternatives, and to assess the physical and biological characteristics of the site including contamination source, nature, extent, transport and fate of the contamination. The RPM and oversight assistant will oversee the field activities performed by the PRP, including field sampling and laboratory analysis activities (see Appendices B and C in Volume 2), to ensure that the PRP activities conducted during site characterization conform to the Project Plans previously approved by EPA. Data are gathered for other analyses conducted during Site Characterization (for example, EPA's Risk Assessment, Treatability Study Evaluation, and the Natural Resource Trustee Survey), so that the FS can be conducted and completed without the need for additional information gathering.

4.2 PURPOSE AND GOAL FOR THE RPM

During site characterization, the RPM approves the PRPs' sampling and well drilling activities, verifies the PRPs' documentation of the field activities, and verifies that the PRPs meet ARARs (to the extent practicable) for actions conducting during the RI (e.g., during well drilling at a historic site). In addition, the RPM should ensure that any wastes generated during the RI which are taken off-site for treatment or disposal are managed in accordance with applicable Federal and State requirements. Information obtained through this process will serve as the basis for determining the remedial action to be taken. The RPM can identify areas where additional data will be needed to characterize the site, ensure that this information is obtained to meet QA/QC concerns, and attempt to avoid unnecessary sampling activities. The RPM also should review the PRPs' definition of site characteristics, and the source(s), nature and extent, volumes/levels, and the potential transport and fate of the known contaminants. These activities should be described in the draft and final RI Reports.

4.3 TIMEFRAME

Due to the iterative nature of sampling phases and resampling events, one cycle of the site characterization task can take up to 12 months to complete. The timeframe for site characterization, however, will depend on the following:

- Potential extent and number of site problem areas (for example, with respect to soils, surface water, groundwater, air emissions, etc.);
- Potential for multiple sampling events and drilling phases (for example, for source control, soils, groundwater, surface water, etc.);
- Turnaround time for laboratory analysis;

- Need for resampling if initial data are unacceptable or for additional sampling to fill data gaps and determine the extent of contamination;
- Time needed for EPA to perform the Baseline Risk Assessment and for EPA or the State to support the need for Treatability Studies;
- Seasonal variations and adverse climatic conditions that affect collecting accurate and representative samples;
- Time for EPA to review deliverables; and
- Unexpected discoveries of new sources.

4.4 HOW THE RPM OVERSEES SITE CHARACTERIZATION

The RPM and/or oversight assistant perform the following oversight activities, focusing on the PRPs' sampling and analysis tasks, to acquire accurate and complete data, as described in the following sections:

- Meet with the oversight team;
- Review proposed field activities;
- Visit the site;
- Document and track field activities;
- Assess changes in original data needs;
- Conduct meetings;
- Review progress and interim reports;
- Conduct management review; and
- Update the files.

Each of these is discussed below.

Oversight Team Meeting

Meet with the oversight team (including, as appropriate, oversight assistant, TST, States, ATSDR, Natural Resource Trustees) prior to initiating the planned field activities to determine:

- Qualifications of any additional subcontractors not previously evaluated that are needed to perform the various field procedures;
- The technical resources and remedial equipment available to the PRP or its contractor;
- How the field activities will characterize the site, define the types and sources of contaminants, and describe the nature and extent of contamination;
- How to ensure that the planned activities will correspond to the Work Plan and SAP;

- Procedures for notifying PRPs and, if necessary, EPA counsel if PRPs' field procedures deviate from the Work Plan and SAP;
- The appropriate sampling and drilling procedures, especially the number of samples and wells drilled, types of sampling to conduct (splits, spikes, and blanks), specific location of the sampling equipment, procedures to transport samples, and validation of samples for completeness. (Use Appendices B and C of this manual in Volume 2 to oversee and document sampling and well drilling activities.);
- The status of contacts with ATSDR, States, and Natural Resource Trustees; and
- The use of a personal computer (PC)-based tracking system to monitor the progress of the field activities and keep down-time to a minimum.

Proposed Field Activities and Sampling and Analysis

Review proposed field activities and sampling and analysis activities. (See Appendices B and C of Volume 2. A checklist to document sampling and analysis activities is contained in Appendix B; a checklist to document well drilling and analysis activities is contained in Appendix C.)

Note: The RPM will need to schedule into the sampling and analysis tasks other activities, including providing RI data for an ATSDR Health Assessment, the Natural Resource Trustee Survey, EPA's Baseline Risk Assessment, and the PRPs' Treatability Studies Evaluation. Therefore, it is important for the RPM to verify, even if only by spot checking, the qualifications of all personnel and the quality of the equipment used and data generated before the initiation of field activities.

Site Visit

In addition to the oversight assistant, the RPM or another qualified EPA representative such as a person from the Region's ESD should visit the site during the initial phase of site characterization to observe the PRPs' initial sampling and well drilling activities. The RPM should review the PRPs' capability to satisfy the Regional SOPs, perform the required field activities, and review the oversight assistant's capability to perform field oversight of the PRPs.

Field Activities

Document and track field activities using checklists (for example, those presented in Appendices B and C of Volume 2), or Regional checklists or a field logbook. Figure 4-1 summarizes four useful tools to document field activities. Also, review PRP and oversight assistant monthly progress reports, PRP special activity reports, and laboratory reports. Field activities should be performed if the activity aids in obtaining a site objective, helps to refine the site conceptual model, or identifies an area that will require additional data.

Meeting ARARs

Verify that PRPs are meeting location- and chemical-specific ARARs (and other ARARs if known at this time) to handle the management of investigation-identified waste to be taken off-site for treatment or disposal, and to mitigate or avoid impacts to historic resources and endangered species even during routine field activities.

Figure 4-1. Summary of Tools to Document Field Activities

Field Activity Reports	
Purpose:	These reports help the RPM and the oversight assistant to be consistent regarding the need to document field activities.
Uses:	These reports are a way to check that the conducted field activities are consistent with procedures agreed to in the Work Plan and SAP, and are available to assist EPA if the field activity leads to future litigation.
Specifics:	Use water-resistant ink, draw through all errors, initial all corrections, and date and sign all reports.
Assistance:	See checklists for documenting the conduct of sampling and well drilling activities in Volume 2, Appendices B and C.
Field Logbook	
Purpose:	This logbook supplements the field activity report to record additional site incidents and activities.
Uses:	This logbook contains information supplemental to decision making, such as conversations with key personnel, potential or actual problems encountered, explanations for changes in project plans, and other oversight discussions or observations.
Specifics:	Use water-resistant ink, draw through all errors, initial all corrections, number and bind the log, and date and sign all entries.
Assistance:	The RPM, as needed, determines the content of this logbook.
Photographic or Videotape Log	
Purpose:	This log gives a visual presentation of the physical conditions of the site and can be used to show how field activities were conducted and verify what equipment was used.
Uses:	This log is a way to check that the conducted field activities are consistent with procedures agreed to in the Work Plan and SAP, when the field activity pertains to remedy selection, and is available to assist EPA if the field activity leads to future litigation.
Specifics:	Include date, time, and location on each entry, an orientation of the photographs or video, a description of the activity on the back of the photograph or orally on the videotape, and the person(s) responsible for the photographs or video.
Assistance:	Contents and maintenance of the log are the decision of the RPM.
Laboratory Reports	
Purpose:	These reports document that the sampling procedures were conducted to satisfy EPA collection protocols, were performed to the agreed upon chain-of-custody procedures, and were analyzed according to EPA's CLP protocols.
Uses:	These reports verify that the conducted field activities are consistent with procedures agreed to in the Work Plan and SAP, consistent with CLP protocols, verifiable using QA/QC parameters – important when the field activity pertains to remedy selection, and are available to assist EPA if the field activity leads to future litigation.
Specifics:	Label samples with time, date, location, and type; properly store and transport samples; follow appropriate chain-of-custody procedures; regularly calibrate the sampling equipment; perform QC of sample types; and conduct field and laboratory audits as needed.
Assistance:	References for documenting sampling and well drilling activities are listed in Appendices B and C in Volume 2 of this guidance.

Data Needs	Ensure that the PRP satisfies the data needs or activities of the Natural Resource Trustee's Preliminary Survey, EPA's Baseline Risk Assessment, and the Treatability Study Evaluation Report during site characterization. Get input from these parties on their specific concerns before performing unnecessary field activities.
Progress Meetings	Conduct meetings with the PRP, oversight assistant, and members of the TST (including State representative) on the content of monthly progress reports, the Preliminary Site Characterization Summary, and the direction of future field activities.
Review Summary and Report	With assistance of the TST and State, when appropriate, review and comment on the Preliminary Site Characterization Summary and the draft RI Report.
Management Review Meeting	Conduct a Regional management review meeting to discuss the Preliminary Site Characterization Summary, EPA's Baseline Risk Assessment (if already conducted), and the RI Report.
File Updates	Continually update the site file, Administrative Record File, and cost recovery documentation.
Fact Sheet	If appropriate,, develop a fact sheet from the generated data, the Site Characterization Summary, and the final RI Report to present to the public. Send a copy of the RI Report to ATSDR.

Note: The community may need to be notified before conducting apparent or intrusive field activities (for example, forewarn the community of drilling activities in streets or a school yard).

4.5 DELIVERABLES DURING SITE CHARACTERIZATION

The PRP will submit a Preliminary Site Characterization Summary and a Technical Memorandum on Modeling the Site Characteristics (if necessary) for review and comment, and a draft RI Report for review and approval. Additional deliverables requiring review and comment or approval will be associated with the Treatability Study Evaluation Report (see Chapter 6) and a final RI Report. The PRP deliverables during site characterization should answer the following types of questions:

- Site Characterization Summary
  - Does the summary provide a brief description (a few pages or set of tables) on the site characteristics to satisfy the requirements of this summary in the RI/FS Guidance, Chapter 3?
  - Does the summary assure that EPA gets data for the Baseline Risk Assessment as soon as possible?
  - Does the summary satisfy the checklist of items in the Enforcement Project Management Handbook, RI/FS Implementation Chapter, Section 6?

- Does this summary contain information to help the RPM or State identify ARARs?

- Technical Memorandum on Modeling Site Characteristics (if necessary)
  - Does the site complexity require this model?
  - Does this memorandum identify and describe any special site features that would be addressed by modeling?
  - Can the modeling assumptions be identified clearly?

- Draft/Final RI Report
  - Does this report follow the format in the RI/FS Guidance, Chapter 3, Table 3-13, and the Enforcement Project Management Handbook, RI/FS Implementation Chapter?
  - Does this report include deliverables on the need to conduct Treatability Studies, if necessary?
  - Does this report reflect specific concerns from EPA, State, ATSDR, and Natural Resource Trustees raised during review of the RI/FS Work Plan and SAP?
  - Does this report identify and justify additional activities needed?

Other Deliverables

- Monthly Progress Reports
  - Do these reports contain useful, accurate, and timely data?

- Laboratory Reports
  - Do these reports satisfy our QA/QC concerns for a data analysis that is legally defensible?

- Field Activity Reports
  - Do these reports describe the site activities in detail to justify the activities in progress and support the need for future field activities?

- Photographic Logs/Aerial Photographs
  - Do these photographs help to justify performing the present activities and support the need for future activities?

- Shipment Records
  - Do these records identify owners, generators, transporters, types, volumes, concentrations, and dates of disposal of site contaminants?

4.6 FOR FURTHER INFORMATION

- National Contingency Plan (NCP), 40 CFR 300.430(a).
- Guidance for Conducting RI/FS Under CERCLA, OSWER Directive No. 9355.3-01, October 1988, (Chapter 3).
- The Remedial Investigation - Site Characterization and Treatability Studies, OSWER Directive No. 9355.3-01FS2, November 1989.
- Interim Guidance on PRP Participation in RI/FS, OSWER Directive No. 9835.1a, May 16, 1988.
- Model Statement of Work for RI/FS Conducted by PRPs, OSWER Directive No. 9835.8, June 2, 1989.
- Enforcement Project Management Handbook, OSWER Directive No. 9837.2-A, January 1991.
- Risk Assessment Guidance for Superfund, Human Health Evaluation Manual (HHEM) Part A, OSWER Directive No. 9285.701A, July 1989.
- Risk Assessment Guidance for Superfund, Volume II, Environmental Evaluation Manual (EEM), EPA/540/1-89/001, March 1989.
- Superfund Exposure Assessment Manual, OSWER Directive No. 9285.5-1, April 1, 1988.
- Compendium of Superfund Field Operation Methods, OSWER Directive No. 9355.0-14, August 1987.
- Chemical, Physical, and Biological Properties of Compounds Present at Hazardous Waste Sites, OSWER Directive No. 9850.3, September 27, 1985.

4.7 RESOURCES AVAILABLE TO THE RPM

Personnel

- Oversight Assistant.
- Technical Support Team (TST).
- Regional Staff (Peer Review, Management Review, ESD, ORC and ORD).
- Headquarters Staff (OWPE, OGC, OE - Superfund Division).
- Other Federal Agencies (ATSDR, USCOE, USDA-SCS, Natural Resource Trustee, U.S. Department of Commerce (DOC)-USFWS).
- States (EPA-equivalent, SFWS, SGS, State Trustee).
- Contract Laboratory Program (CLP) and non-CLP Laboratories.

Documents

- Work Plan and Sampling and Analysis Plan (SAP).
- ATSDR Health Assessment.
- Site Characterization Summary.

- Draft RI (with or without Baseline Risk Assessment).
- Checklists on sampling and well drilling (Appendices B and C).
- EPA's Baseline Risk Assessment (if available).

Data

- Sampling Activities Summary
  - Collection.
  - Analysis.
  - Evaluation.
- Well Drilling Activities
  - Number/Location.
  - Cores.
  - Analysis.
  - Evaluation.
  - Monitoring.

4.8 HELPFUL HINTS FOR THE RPM

During Site Characterization, the RPM should:

- Ensure that field activities are consistent with the Work Plan and SAP;
- Oversee the oversight assistant's performance and its timely reporting of site characterization activities;
- Determine the ability of PRP (and PRP contractors) to conduct field activities, for example, drill the needed exploratory, development, or monitoring wells and collect quality samples, consistent with site complexity;
- Identify previously unknown contaminants;
- Review the major PRP deliverables (Preliminary Site Characterization Summary, Treatability Study Evaluation Report, and draft and final RI Reports) and interim deliverables;
- Notify PRPs and, if necessary, EPA counsel of any AOC noncompliance;
- Keep the public informed of upcoming field activities, especially highly visible or intrusive field work; and
- Ensure location-specific ARARs (and other known ARARs) have been considered (for example, critical habitat, historic property).

To help minimize the time spent on site characterization, the RPM should:

- Visit the site during initial sampling and well drilling activities;
- Take QC samples and audit the PRPs' laboratory to meet QA/QC concerns;
- Ensure documentation of field activities and all generated findings;

- Incorporate EPA's Baseline Risk Assessment, where available (see Chapter 5), and the Treatability Study Evaluation (see Chapter 6) activities into site characterization;
- Coordinate with the Natural Resource Trustee, ATSDR, and State;
- Update the site file, Administrative Record File, and cost recovery documentation and information; and
- When PRP deliverables are reviewed, impose deadlines and followup with tardy reviewers, and notify PRPs and, if necessary, EPA counsel of noncompliance.

CHAPTER 5

BASELINE RISK ASSESSMENT

5.1 INTRODUCTION

The Baseline Risk Assessment is conducted during the RI. It is an iterative process that begins at post-AOC scoping and ends with preparation of a document that usually is included as a chapter in the RI Report. Beginning with all AOCs signed after June 21, 1990, it is EPA's policy that the Agency will prepare the Baseline Risk Assessment at Enforcement-lead sites (see "Performance of Risk Assessments in Remedial Investigation/Feasibility Studies (RI/FSs) Conducted by Potentially Responsible Parties (PRPs)" (OSWER Directive No. 9835.15, August 28, 1990)). For those sites with an ongoing PRP risk assessment, careful oversight is critical in order to ensure the timely development of an acceptable Baseline Risk Assessment. The above-referenced directive also states that EPA should certify that each PRP risk assessment is acceptable.

Note: EPA is preparing a guidance document on how to conduct the Baseline Risk Assessment at PRP-lead sites. The guidance will include language changes to the Model AOC and Model SOW.

5.2 PURPOSE AND GOAL OF THE BASELINE RISK ASSESSMENT

The Baseline Risk Assessment has two major purposes. The first purpose is to help determine if a site poses a current or potential risk to human health (through a human health evaluation) or the environment (through an ecological assessment) in the absence of any remedial action. The risk assessment may form the basis for finding that the site may present an imminent and substantial endangerment. The risk assessment also may show that the baseline risks are acceptable and that remediation is not needed in spite of the site's Hazard Ranking System (HRS) scoring. The second major purpose of the Baseline Risk Assessment is to help determine remediation goals for the site contaminants. Remediation goals are chemical concentrations set at risk-based levels that are protective of human health and the environment (or at chemical-specific ARAR levels, where available).

The RPM needs to involve Regional staff and TST members early in post-AOC scoping to ensure that PRPs are given adequate direction to perform the site characterization activities. The quality of the Baseline Risk Assessment is based upon the accuracy of the activities performed, data collected, and data evaluated during site characterization. If the proper number of samples is not taken in the proper location and appropriate media of concern, the risk assessment will not accurately reflect the risks presented by releases from the site.

The RPM also should ensure that when preliminary remediation goals (PRGs), developed in post-AOC scoping, are modified based on the risk assessment results, these modified remediation goals are then used in the FS to establish refined remedial action objectives and to develop, screen, and perform a detailed analysis of the potential alternatives.

5.3 TIMEFRAME

Baseline Risk Assessment is performed concurrently with site characterization and may take up to 12 months to complete. It should be noted, however, that data for the Baseline Risk Assessment usually lags behind fieldwork data. The risk assessment report cannot be written until all sampling data have been verified. The timeframe for the Baseline Risk Assessment, however, will be influenced by many factors, including amount of existing site data, complexity of the site, contaminants (type, concentration, media affected, pathways, etc.), turnaround time for laboratory analysis, number of resampling events, and choice of risk models and assumptions used to generate the remediation goals.

5.4 HOW THE RPM OVERSEES A PRP RISK ASSESSMENT

Procedures for performing a PRP Baseline Risk Assessment are in Volumes 1 and 2 of the Risk Assessment Guidance for Superfund (RAGS):

- Risk Assessment Guidance for Superfund, Volume 1, Human Health Evaluation Manual (OSWER Directive No. 9285.701A, EPA/540/1-89/002, December 1989); and
- Risk Assessment Guidance for Superfund, Volume II, Environmental Evaluation Manual, EPA/540/1-89/001, March 1989.

The RPM must ensure that the PRP and its contractor follow Volume 1 for developing a human health evaluation, Volume 2 for developing the environmental evaluation or ecological assessment, other guidances listed in Section 5.6, and any subsequent guidance on risk assessment. The RPM must ensure that there are frequent discussions between EPA Regional risk assessors and the PRP and its contractor.

The RPM, with the assistance of the Regional risk assessors and/or the oversight assistant, performs the tasks described in the following sections during a PRP Baseline Risk Assessment.

Risk Assessor Meetings

During post-AOC scoping, meet with Regional risk assessors (usually one assessor for human health and one for the environment) or oversight assistant to discuss existing site information (PA/SI or other data); EPA's preliminary site conceptual model (chemicals of concern, potential sources of contamination, exposure pathways, existing risks to human health and the environment); and the preliminary site objectives and remediation goals.

PRP Work Plan Contents for the Baseline Risk Assessment

Ensure that the PRPs' Work Plan is amended and contains a preliminary analysis of the following:

- Chemicals of concern;
- Site objectives including remediation goals;
- Potential ARARs affected by the site;
- Risk-based levels to be achieved, (PRGs are set at 10^{-6} if the site has no chemical-specific ARARs that are deemed to be protective);

- Populations at risk; and
- The need for interim actions.

PRP Staff and Contractor

Verify the technical quality of PRP staff and contractor to perform the risk assessment before the initiation of field activities.

During site characterization, verify that for the Baseline Risk Assessment, the following occurs:

- Data Collection
  - All key site characteristics including soil/sediment, hydrological, hydrogeological, and meteorological parameters are documented;
  - All appropriate media are sampled for existing and potential contamination;
  - All potential "hot spots" as well as appropriate background locations are to be sampled, if necessary;
  - The sampling maps are sufficiently detailed for locating sampling locations and, if necessary, for assuring that fieldwork space is available for performing sampling activities; and
  - The data reflect EPA's preference to accurately represent contaminant levels, by using unfiltered groundwater/surface water sampling results.
- Data Evaluation
  - No site-related chemicals are eliminated from the risk assessment unless a valid explanation is supplied by the PRP;
  - Sample concentrations are compared to concentrations in the blanks;
  - Sample concentrations are compared to background samples;
  - All chemicals found at the site are listed by the PRP in the risk assessment; and
  - Contaminants of concern are identified for use in the risk assessment.
- Exposure Assessment
  - All current and potential future land uses are identified;
  - All populations of concern, especially any sensitive groups and aquatic and terrestrial populations, are identified;
  - All exposure pathways for each medium of concern are evaluated;
  - Exposure concentrations reported for each medium represent the 95 percent upperbound estimate of the mean;

- Exposure intakes for each chemical for each exposure scenario are based on reasonable maximum exposure (RME) assumptions;
- The appropriateness of the exposure assumptions used, if different from the standard EPA default values, is evaluated;
- Appropriate chemical intakes across pathways within the same media are combined; and
- Uncertainties in the exposure assumptions are identified by the PRP.

• Toxicity Assessment

- For noncarcinogenic effects, EPA-verified chronic and subchronic reference dosages (RFDs) for each route of exposure (oral, inhalation, dermal) are used when available;
- For carcinogenic effects, EPA-verified cancer potency factors are used when available;
- PRPs' selection of toxicity values for all chemicals for which there are no EPA-verified toxicity values must be approved by EPA; and
- Uncertainties in the toxicity information are evaluated by the oversight team.

• Risk Characterization

- PRPs calculate a cancer risk and/or a hazard index for each chemical of concern;
- Aggregate risks or hazard indices for multiple chemicals are presented;
- Total cancer risk and hazard index are estimated;
- Uncertainties in the Baseline Risk Assessment results are evaluated; and
- Results of the Baseline Risk Assessment are compared to the ATSDR Health Assessment for consistency.

Oversight Team Meeting

Meet, as needed, with members of the oversight team, especially risk assessors, State, ATSDR, and Natural Resource Trustee representative to review the PRPs' preparation of the Baseline Risk Assessment. (See the Reviewer Checklist in Exhibit 9-2 and the Checklist for Manager Involvement in Exhibit 9-3 of the Human Health Evaluation Manual (HHEM)).

Technical Memoranda

Review and comment on PRP technical memoranda (regarding chemicals of concern, amendments to the Work Plans for performing Baseline Risk Assessment activities, use of exposure scenarios and assumptions, and verification of toxicity values used), included in the draft and final Baseline Risk Assessment (human health evaluation and ecological assessment). See suggested Outline for a Baseline Risk Assessment Report in Exhibit 9-1 of the HHEM.

Administrative Record	Continually update the Administrative Record File and cost recovery documentation.
Fact Sheet	If appropriate, the RPM or oversight assistant should develop a fact sheet explaining existing and potential risks to human health and the environment and present it to the public.

5.5 DELIVERABLES DURING OVERSIGHT OF A PRP BASELINE RISK ASSESSMENT

The PRP submits, at a minimum, the documents listed below during a PRP Baseline Risk Assessment. They should be reviewed by Regional risk assessors, other Regional scientists, and appropriate members of the TST (including States) to answer the following questions for each document:

- Memorandum listing all hazardous substances found at the site and those selected as chemicals of potential concern:
  - Is there a complete list of chemicals of concern?
- Work Plan for evaluating environmental risks to aquatic and terrestrial organisms:
  - Are appropriate media covered by the sampling plan?
  - Will the sampling locations identify potential routes of migration and "hot spots" of contamination?
- Memorandum describing all appropriate exposure scenarios and all assumptions and exposure factors used to calculate the reasonable maximum exposure (RME). This includes a description of any fate and transport models:
  - Are RMEs identified using exposure concentrations, standard default values, and spatial relationships?
  - Are current and future land uses addressed?
  - Are residential risk and risk to sensitive subpopulations presented accurately?
  - Are contaminant pathways for all affected media presented?
  - Are there any cross-media transfer effects that need to be considered?
- Memorandum listing any toxicity values used and not verified by EPA (that is, not in the Integrated Risk Information System (IRIS) or the Health Effects Assessment Summary Tables (HEAST) databases):
  - Are the toxicity values developed according to EPA guidance for documentation?
  - Are the appropriate toxicity values based on "nature of exposure"?

- Are the appropriate "route-to-route" extrapolations identified in cases where a toxicity value is applied across "differing" routes of exposure?

- Are any carcinogens excluded? Why?

- *Draft and final* Baseline Risk Assessment reports (including the human health evaluation and the ecological assessment):

  - Is the format consistent with the suggested outline in Exhibit 9-1 of the HHEM?

  - *Are the necessary items of the Reviewer's Checklist* (Exhibit 9-2 of the HHEM) included in the Baseline Risk Assessment?

  - Are the necessary items of the Checklist for Manager Involvement (Exhibit 9-3) included in the Baseline Risk Assessment?

  - Does the Baseline Risk Assessment address all Regional, State and local concerns?

5.6 FOR FURTHER INFORMATION

General References

- National Contingency Plan (NCP), 40 CFR 300.430(d).
- Roles of the Baseline Risk Assessment in Superfund Remedy Selection Decisions, OSWER Directive No. 9355.0-30, March 1991.
- Performance of Risk Assessments in Remedial Investigation/Feasibility Studies (RI/FSs) Conducted by Potentially Responsible Parties (PRPs), OSWER Directive No. 9835.15, August 28, 1990.
- Risk Assessment Guidance for Superfund, Volume 1, HHEM, OSWER Directive No. 9285.701A, EPA/540/1-89/002, December 1989.
- Risk Assessment Guidance for Superfund, Volume II, EEM, EPA/540/1-89/001, March 1989.
- Ecological Assessment of Hazardous Waste Sites: A Field and Laboratory Reference, EPA/600/3-89/013, March 1989.
- Superfund Exposure Assessment Manual (SEAM), OSWER Directive No. 9285.5-1, April 1, 1988.

Databases

- Risk Assistant (ORD database for risk assessments).
- IRIS.
- HEAST.
- AQUIRE (ORD's aquatic toxicity database).

5.7 RESOURCES AVAILABLE TO RPMS

Personnel

- Oversight Assistant.
- Regional staff (risk assessors, health and ecological scientists in ESD, ORC, and ATSDR representative).
- Technical Support Team (TST).
- Biological Technical Assistance Group (BTAG).
- Headquarters Staff (OWPE, OGC, OE - Superfund Division).
- Other Federal Agencies - USCOE, USGS, USFWS, Center for Disease Control (CDC).
- States - EPA-equivalent Agency, SGS, SFWS, SHPO.

Documents

- Memorandum listing all hazardous substances found and those selected as chemicals of concern.
- Work Plan for evaluating environmental risk.
- Memorandum describing all appropriate exposure scenarios (based on RME assumptions) and fate and transport models.
- Memorandum listing any toxicological and epidemiological studies used (supplementing EPA values).
- Draft and final Baseline Risk Assessment report (includes the human health evaluation and the ecological assessment).

Data

- ATSDR Health Assessment and Toxicological Profiles.
- Results from all Technical Memoranda.
- EPA Standard Values for Exposure and Toxicity.

5.8 HELPFUL HINTS FOR THE RPM

To avoid project delays during a PRP Baseline Risk Assessment, the RPM should look for the following:

- Inappropriate elimination of chemicals from the risk assessment by the PRP;
- Failure of PRP to consider all exposure pathways;
- Failure to sum the appropriate hazard indices and cancer risks;
- Failure to sample all appropriate media of concern;
- Failure to properly estimate the RME concentration for each medium;

- Inappropriate exposure scenarios;
- Failure to address non-cancer effects of carcinogens; and
- Failure to use non-residential exposure scenarios when future exposures outside of those to residents is likely to occur.

To help minimize the time spent on performing and evaluating a PRP Baseline Risk Assessment, the RPM should:

- Present PRPs (or PRP contractors) with examples of acceptable Baseline Risk Assessments;
- Have Regional risk assessors meet with PRP contractors to clarify any ambiguity;
- Check PRP progress on technical memoranda (interim deliverables) before final Baseline Risk Assessment report;
- Check the standard exposure scenarios for similar sites;
- Establish early the contaminants to be evaluated;
- Establish early the exposure scenarios to be used; and
- Notify PRPs and, if necessary, EPA counsel of any noncompliance.

CHAPTER 6

TREATABILITY STUDIES

6.1 INTRODUCTION

Treatability studies are laboratory or field tests designed to provide the data needed to evaluate and select one or more treatment technologies. Treatability studies performed during the RI/FS to provide information to support the detailed analysis and remedy selection tasks and to determine whether the potential technology can be expected to achieve the remediation goals set in the FS. Treatability studies are performed when a technology cannot be adequately evaluated on the basis of the existing information. This may be due to the level of development of the potential technology, the composition of waste, and the nature and representativeness of the required data.

Treatability study activities occur throughout the RI/FS; a literature survey is performed during post-AOC scoping, field studies are performed during the RI, and an analysis of the treatability studies will support the treatment alternatives developed and screened during the FS. The time needed to perform and evaluate treatability studies may be extensive so that beginning treatability studies in post-AOC scoping can help to prevent project delays in the FS and later in the remedial design/remedial action (RD/RA). Therefore, treatability studies should be conducted and completed during the RI.

6.2 PURPOSE AND GOAL FOR THE RPM

During the treatability study task, PRPs identify a general list of treatment technologies, in which treatment is used to the maximum extent practicable and only where it is practicable. These technologies should address groundwater contamination and the principal threats of contamination. The technologies also should meet the following capabilities (as stated in NCP Section 300.430(d)):

- Protect human health and the environment;
- Maintain protection over time;
- Minimize the amount of untreated waste;
- Return contaminated ground water to its previous beneficial uses, if appropriate;
- Reduce the mobility or concentration of contamination by 90 to 99 percent, either individually or by treatment trains; and
- Identify, to the extent available, the use of innovative technologies for treatment of the toxic/mobile contaminants.

The goal of the RPM is to determine, with support from the members of the TST, ORD, or other approved contractor with expertise in treatment technologies, the need for treatability studies early in the RI/FS process (for example, in post-AOC scoping). The RPM should emphasize the importance of the following:

- How acquiring the additional treatability data will satisfy the preliminary remedial objectives and alternatives; and
- How the PRP will use the treatability study data to evaluate alternatives and aid in remedy selection.

If the treatability studies are conducted after the RI (during either FS or RA), the time needed to conduct treatability studies can lead to a major project delay. After treatability studies have been completed, the RPM, with technical support, should verify and document the quality of the treatment data generated by each proposed study.

6.3 TIMEFRAME

The time necessary for the treatability studies task is directly related to the number and kind of studies required. Treatability studies can and should be completed during site characterization; therefore, these studies can take up to 12 months. The completion of treatability studies, however, is dependent on the following:

- Size or complexity of the site;
- Specific site limitations that would preclude the use of certain treatment technologies;
- Type of treatment data needed: laboratory, bench-scale, and pilot-scale;
- Treatment and residual levels to be attained; and
- Content and quality of the treatability study evaluation report.

6.4 HOW THE RPM OVERSEES TREATABILITY STUDIES

During post-AOC scoping, the PRP conducts a literature survey to determine the need for treatability studies. The resulting PRP memorandum describes the need (or lack of need) for performing treatability studies, identifies the treatment and residual levels (for example, MCLs, maximum contaminant level goals (MCLGs), ARARs, PRGs, etc.) to be attained by performing treatability studies, and lists the potential treatment technologies that may be able to meet these treatment and residual levels.

The need for treatability studies can depend on activities performed after approval of the PRPs' Work Plan (for example, ATSDR's Health Assessment, Site Characterization Summary, Baseline Risk Assessment (EPA or PRP), and the Preliminary Natural Resource Trustee Survey). Therefore, the PRPs may need to revise or amend the existing PRP Work Plan, SAP, and HSP to include treatability studies. The RPM, with support from the oversight assistant and TST, should review the PRPs' memorandum and approve the revisions or amendments to the Project Plans.

The RPM and oversight assistant should perform the activities described in the following sections to oversee the PRPs, either during post-AOC scoping when determining the need for treatability studies, or during site characterization

when determining the applicability and feasibility of using the identified treatment technologies.

Relevant Guidance Documents

Supply the PRPs with relevant guidance documents (for example, references listed in Section 2.5). The RPM can contact ORD's SITE Program, Superfund Technical Assistance Response Team (START), Treatability Assistance Program (TAP), ATTIC, and other approved contractors with expertise in treatment technologies for assistance. See Appendix A to access these resources.

Technical Memorandum

Review and approve the PRPs' Technical Memorandum that identifies the candidate technologies and describes how the literature survey was performed by the PRPs during post-AOC scoping.

Treatment Technology List

Meet with the oversight assistant, TST, State, and ORD to comment on the adequacy of the list of treatment technologies. Treatment technologies decisions and treatability study type decisions should be performed for each technology (for example, laboratory, bench-scale, or pilot-scale). (See Figure 6-1.) The PRPs, with support from experts on treatment programs, should devise a schedule for preliminary study to be performed during site characterization. The RPM should approve the schedule of treatability activities.

PRP Project Plans Amended for Treatability Studies

If necessary, review the original PRP Project Plans (Work Plan, SAP, HSP) and revise or amend the Project Plans to include a detailed description and explanation of the need for and kind(s) of treatability studies to be performed, or reason(s) not to perform, a particular study. The RPM should make sure that the amended Project Plans adequately consider innovative technologies.

Note: These last two steps correspond to the first step during site characterization. Plans to describe which activities need to be performed, who will perform these activities, and what will be gained from performing these activities must be in place prior to the initiation of field activity.

Treatability Studies

Prior to PRP initiation of activities relating to treatability studies, the RPM or oversight assistant should verify the following:

- Qualifications of the PRPs, PRP contractors, and laboratory to perform each study;
- Proper protocols that conform to CLP protocols will be used by the PRP laboratory;
- Reasons for, or expectations of, each study (for example, identify remediation goals to be met that protect human health and the environment; comply with ARARs (Federal or State), including land disposal restrictions (LDRs); reduce waste toxicity, mobility, or volume, for delisting a RCRA waste);

Figure 6-1. Kinds of Treatability Studies

	Laboratory Screening Studies	Bench-Scale Testing	Pilot-Scale Testing
Purpose	To determine whether a technology is potentially viable to treat a waste.	To identify a technology's performance on a waste-specific basis for an operable unit.	To provide quantitative performance and cost data and to optimize design parameters on an operable unit.
Approximate Cost	$10K to $50K	$50K to $250K	$250K to $1,000K
Timeframe	Hours or days to complete.	Days or weeks to complete.	Months to complete.
Result	To decide whether to proceed with bench- or pilot-scale testing.	To decide whether to proceed to pilot-scale or whether the technology can meet expected remediation goals and can support the nine evaluation criteria in the detailed analysis portion of the FS.	To determine whether the technology can meet expected remediation goals and support the use of innovative technologies.
Data Needed for Decision	Qualitative with less "statistical significance" needed; fewer process parameters are included in the evaluation. (Note: Generally not used as a sole basis for selecting a remedy.)	Quantitative performance estimate and rough cost data.	Quantitative performance and cost data, data on operational parameters, and data on side streams and residuals. (Note: The data should provide proof that the technology can meet remediation goals.)

- Equipment to be used in each study; and
- Validation of the data that will be generated from performing each study.

Note: There is a presumption that response actions involving the placement of treated soil and debris contaminated with RCRA-regulated wastes will utilize a Treatability Variance to comply with LDRs and that, under these variances, the treatment levels outlined in Superfund Guide #6A (OSWER Directive No. 9347.3-06FS, July 1989 and revised March 1990) will serve as alternative "treatment standards."

Site Visit

Conduct a site visit during an initial stage of a treatability study, especially if the potential treatment technology will involve the use of an in situ process or will include how to ascertain the emissions resulting from any excavation. The RPM also can oversee the feasibility of using a treatment process as well as verifying the data generated by the treatment study.

Treatability Study Evaluation Report

Review and approve the draft PRP Treatability Study Evaluation Report with input and comments from the TST, ORD, other support staff, and State to ensure that:

- The performed work satisfies Federal and State requirements to conduct the test;
- Technologies for treatment include innovative technologies where possible;
- The type and volume of waste to be treated, media of contamination, and area required for treatment process are identified;
- Treatment levels (for example, land ban, percentage or order of magnitude reduction expected, MCLs (or MCLGs greater than zero) satisfied) are discussed;
- Residual levels (e.g. RCRA clean closure, National Pollutant Discharge Elimination System (NPDES) limits, and RCRA delisting, as appropriate) are discussed; and
- The assumptions, implementation requirements, specific limitations, and uncertainties used at the site are explained.

Administrative Record File

Continually update the Administrative Record File and cost recovery documentation.

6.5 DELIVERABLES DURING TREATABILITY STUDIES

The deliverables relating to treatability studies will be submitted by the PRPs during the post-AOC scoping and the site characterization tasks. During post-AOC scoping, the RPM will review and approve the PRPs' Technical Memorandum Identifying Candidate Technologies and review and approve or comment on revisions or amendments to the PRP Project Plans (Work Plan, SAP, HSP). During site characterization, the RPM will review and approve the draft and final PRP Treatability Study Evaluation Report.

As a guide for reviewing the PRP treatability study deliverables, the RPM should use the "effectiveness of treatment technology for contaminated soils" matrix presented in Figure 6-2 (taken from the "Summary of Treatment Technology Effectiveness for Contaminated Soils," EPA/540/2-89/053, February 1989). This figure identifies which treatment technology is effective or ineffective on a particular type of soil contaminant until EPA develops standard soil cleanup levels. The RPM can obtain additional, up-to-date information by contacting ORD's SITE Program and ATTIC database.

The PRP deliverables during treatability studies should answer questions in the following categories:

- Technical Memorandum Identifying Candidate Technologies
  - Does this memorandum address innovative technologies, as appropriate, such as those developed in ORD's SITE Program?
  - Is it clear which treatability studies will be needed and why, or which studies will not be needed and why not?
  - Do experts from ORD or TST concur on the kinds and number of treatability studies that the PRPs should perform? What about qualifications of all parties to conduct the treatability studies?
  - Will the samples collected for treatability studies be representative of the contaminated media even when multiple kinds of hazardous substances are present?
  - Does the memorandum contain a discussion of treatment and residual levels that can be attained by each treatability study?
  - Do the proposed technologies correspond to the predicted treatment effectiveness for contaminated soil (see Figure 6-2), if applicable?
- Revised or Amended PRP Project Plans
  - Do the original or amended Work Plan, SAP, and HSP address the need for treatability studies?
  - Does the PRP treatment process meet EPA protocols?
  - Have the TST, ORD, State, or other experts agreed on the revisions or amendments to the PRP Project Plans?
- Interim and Final Treatability Study Evaluation Report
  - Did the report document a complete description of the following:
    - -- Name and type of treatability study;
    - -- Reason for and usefulness of conducting study;
    - -- Treatment and residual levels to be attained, if known;
    - -- Personnel that conducted study;
    - -- Name of laboratory evaluating data; and
    - -- Results of study - What worked? What didn't work and why?

Figure 6.2 Potential Treatment Effectiveness For Contaminated Soil

Example Contaminant	Technology / Treatability Group	Thermal Destruction	Dechlorination	Bioremediation[4]	Low Temperature Thermal Desorption	Chemical Extraction and Soil Washing	Immobilization[4]
DDT, DDE	Non-polar Halogenated Aromatics (WO1)	●	◒	◒[3]	● ◒	◒	◒
	PCBs, Halogenated Dioxins, Furans, and their Precursors (WO2)	●	◒	◒	O[1]	◒	◒[1]
	Halogenated Phenols, Cresols, Amines, Thiols, and Other Polar Aromatics (WO3)	●[3]	◒	◒	◒	◒	◒[3]
Vinyl Chloride Trichloroethylene	Halogenated Aliphatic Compounds (WO4)	●	◒[2]	◒[2]	●	◒	◒[2]
Toxaphene, Lindane	Halogenated Cyclic Aliphatics, Ethers, Esters, and Ketones (WO5)	●	◒[1]	◒[1]	O[1]	◒[1]	◒[1]
TNT, RDX	Nitrated Compounds (WO6)	●	O[1]	◒	O[1]	◒	◒[1]
Benzene, Toluene TCE, PCE	Heterocyclics and Simple Non-halogenated Aromatics (WO7)	●	O[2]	◒[2]	●	◒	◒[2]
	Polynuclear Aromatics (WO8)	●	O[2]	◒	O	◒	◒
	Other Polar Non-halogenated Organic Compounds (WO9)	●	O[2]	◒[2]	◒	◒	◒[2]
Chromium, Copper, Aluminum, Zinc	Non-volatile Metals (W10)	O[1]	O[1]	O X[1]	O[1]	◒	●[3]
Arsenic, Cadmium, Lead, Mercury, Silver	Volatile Metals (W11)	X[1]	O[1]	O X[1]	O[1]	◒	●

● Demonstrated Effectiveness (>90% average removal efficiency)

◒ Potential Effectiveness (>70% average removal efficiency)

O No Expected Effectiveness (no expected interference to process) (<70% average removal efficiency)

X No Expected Effectiveness (potential adverse effects to environment or process)

[1] Data were not available for this treatability group. Conclusions are drawn from data for compounds with similar physical and chemical characteristics.

[2] High removal efficiencies implied by the data may be due to volatilization or soil washing.

[3] The predicted effectiveness may be different than the data imply, due to limitations in the test conditions.

[4] These technologies may have limited applicability to high levels of organics and should not be used for volatile organics.

Source: Summary of Treatment Technology Effectiveness for Contaminated Soil EPA/540/2-89/053

- Did the treatment technology data generated satisfy QA/QC concerns?
- Have the treatability study results been reviewed by experts on the TST, ORD, ESD, and State?
- Are the treatability study results documented in the draft and final RI Report?

6.6 FOR FURTHER INFORMATION

General References

- National Contingency Plan (NCP), 40 CFR 300.430(d).
- Guide for Conducting Treatability Studies Under CERCLA, EPA/540/2-89/058, ORD, December 1989.
- Treatability Studies Under CERCLA: An Overview OSWER Directive No. 9380.3-02FS, December 1989.
- Guidance for Conducting RI/FS Under CERCLA, OSWER Directive No. 9355.3-01, Chapter 5, October 1988.
- The Remedial Investigation - Site Characterization and Treatability Studies, OSWER Directive No. 9355.3-01FS2, November 1989.
- Enforcement Project Management Handbook, OSWER Directive No. 9837.2-A, January 1991.
- Guide to Treatment Technologies for Hazardous Wastes at Superfund Sites, EPA/540/2-89/052, March 1989.
- Model Statement of Work for RI/FS Conducted by PRPs, OSWER Directive No. 9835.8, June 2, 1989.

Treatability References

- Compendium of Technologies Used in Treatment of Hazardous Wastes, EPA/625/8-87/014, ORD/CERI, September 1, 1987.
- Inventory of Treatability Study Vendors Vol. 1 and Vol. 2, Draft Interim Final, Pre-publication version, December 1989.
- Treatment Technologies for Hazardous Wastes at Superfund Sites - A guide, EPA/540/2-89/052, OERR, February 1989.
- Technology Screening Guide for Treatment of CERCLA Soils and Sludges, EPA/540/2-88/004, OERR, September 1, 1988.
- Superfund Innovative Technology Evaluation (SITE) Strategy and Program Plan, OSWER Directive No. 9380.2-3, December 1986.
- Analysis of Treatability Data for Soil and Debris: Evaluation of Land Ban Impact on Use of Superfund Treatment Technologies, OSWER Directive No. 9380.3-04, November 30, 1989.

Present and Future References

Treatment Technology Bulletins, which are being developed by OERR and ORD. The initial bulletins will address the following:

- Soil Washing Treatment (EPA/540/2-90/017, September 1990).
- Slurry Biodegration (EPA/540/2-90/016, September 1990).
- Chemical Dehalogenation Treatment: APEG Treatment (EPA/540/2-90/015, September 1990).
- Solvent Extraction Treatment (EPA/540/2-90/013, September 1990).
- Mobile/Transportable Incineration Treatment (EPA/540/2-90/014, September 1990).
- Soil Washing and Solvent Extraction.
- APEG Treatment.
- Slurry Biodegradation and Incineration.
- Low Temperature Thermal Desorption.
- In Situ Biodegradation.
- In Situ Vitrification.
- In Situ Steam Extraction.
- In Situ Soil Vapor Extraction.

Due in FY91:

- Granular Activated Carbon Treatment.
- EPA Technology Preselection Data Requirements.
- In Situ Soil Flushing.
- Chemical Oxidation Treatment.
- Control of Air Emissions from Material Handling.
- Air Stripping of Liquids.

More information on these bulletins can be obtained by contacting the ORD office in Cincinnati, OH (FTS) 398-8444.

6.7 RESOURCES AVAILABLE TO THE RPM

Personnel

- Regional Staff (Peer Review, TST, ORC, Management Review Team, ESD).
- Oversight Assistant.

- ORD (Technology Support Centers, SITE, START, TAP, ATTIC, Technology Forums).
- Headquarters Staff (OWPE, OGC, OE - Superfund Division).
- Other Federal Agencies (USCOE, USDA-SCS).
- States.
- CLP or non-CLP Laboratories.

Documents

- Original or amended Project Plans (Work Plan, SAP, HSP).
- List of Candidate Technologies.
- ORD Publications and Databases.

Data

- Site characterization data.
- Sampling analysis and well drilling core data.
- Literature search.
- Kinds of Studies - laboratory, bench-scale, or pilot-scale.
- Treatment and residual levels to be attained.

6.8 HELPFUL HINTS FOR THE RPM

During the treatability study task, the RPM should ensure that:

- PRP Project Plans address treatability studies;
- Treatment technologies focus on ground water and on the principal threats to protect human health and the environment, maintain this protection over time, and minimize the amount of untreated waste;
- Treatment technologies address concerns relating to emissions during excavations;
- Treatment and residual levels are identified for each treatability study;
- Only technologies that are not cost prohibitive and that are potentially effective in treating the waste should be considered;
- Advice can be obtained from members of the TST, ORD, State, or other expert support staff on the number and type of treatability studies to be performed;
- Innovative technologies have been considered to the extent practicable; and

- PRPs obtain representative samples, properly ship hazardous materials, properly dispose of test residuals, and identify the risks to communities and workers during each test.

To help minimize the time spent on treatability studies, the RPM should:

- Verify, in post-AOC scoping, the need for treatability studies and the list of candidate technologies;
- Contact a representative from ORD to obtain latest information on conducting treatability studies and obtain the most current list of demonstrated and innovative treatment technologies;
- Include a representative from one of ORD's programs on the TST, or ensure that one is present during one of the post-AOC scoping meeting;
- Determine early in post-AOC scoping the type of treatability studies needed - laboratory, bench-scale, pilot-scale;
- Verify the qualifications of the participants, the laboratory, and the equipment that will perform the studies;
- Notify PRPs and, if necessary, EPA counsel of any noncompliance;
- Review content of draft and final Treatability Study Evaluation Report deliverable and request comments from TST, ORD, and State; and
- Make sure that sufficient information on the treatment technologies is collected to determine whether the technology can achieve remediation goals and support the FS analysis based on the nine evaluation criteria.

CHAPTER 7

DEVELOPMENT AND SCREENING OF ALTERNATIVES

7.1 INTRODUCTION

The process of developing and analyzing an appropriate list of RA alternatives (usually no more than four to five for a site of average complexity) is one of the initial tasks of the FS. This list of RA alternatives uses the PRGs generated in post-AOC scoping, modified when appropriate (using the RI and ARARs) to refine remediation goals and establish the performance standards to be attained at each particular site. After the performance standards are refined, remedial action alternatives should be compared to the expectations (stated in the NCP Section 300.430), which include:

- Treatment controls to address principal threats of contamination;
- Engineering (or containment) controls to address low-level threats or where treatment is impracticable;
- A combination of treatment, engineering, and institutional controls where appropriate;
- Institutional controls (such as water use and deed restrictions) as supplements to engineering controls;
- Innovative technologies which offer the potential for comparable or superior treatement performance when compared to the performance of demonstrated technologies; and
- Return usable ground waters to their beneficial uses wherever practicable in a reasonable timeframe.

Note: Development of a range of alternatives may not be necessary in all situations (for example, sites with large volumes of low level contamination, sites where treatment is impracticable, and sites where treatment of the entire site is cost prohibitive). In these situations, the formal screening process may not be necessary due to the limited number of alternatives.

The aim of this task is to devise a complete and concise list of remedial alternatives and screen this list, if necessary, according to cost, effectiveness, and implementability. Screening may not be needed if only a small number of alternatives are developed by the PRP (see note above). In either case, the PRP must generate a comprehensive list that covers the range of reasonable alternatives from which the RPM will be able to select a proposed remedy.

7.2 PURPOSE AND GOAL FOR THE RPM

During the development and screening of alternatives, the PRP should develop a reasonable range of preliminary alternatives to meet the preliminary remedial action goals and then screen the alternatives that are not effective, or implementable, or that are grossly excessive in cost.

When developing a preliminary list of the alternatives, the RPM should review the alternatives for completeness and accuracy, and for technologies which have shown potential success at other sites, or which are innovative and offer the potential for comparable or superior treatment performance.

When screening alternatives, the RPM should ensure that only those alternatives that are unnecessary, duplicative, or impracticable or eliminated.

The most efficient way for the PRP to present the range of alternatives is as an alternatives array document, which usually contains the following:

- Media of concern;
- Remedial action objectives;
- General response actions;
- Remedial technology and type;
- Process options based on technical practicability;
- An evaluation of the options based on effectiveness, implementability, and cost; and
- An alternative based on the control or combination of controls to remediate the affected media.

An example of an alternatives array document is provided in the RI/FS Guidance, Figure 4-6. The alternatives array document should be part of the final FS Report.

7.3 TIMEFRAME

The development and screening of alternatives begins while site characterization activities are underway and field information is gathered on the alternatives. The initial task of the FS, development and analysis of the alternatives, should take up to three months. The completion of this task is dependent on the following factors:

- Size or complexity of the site;
- Number of operable units, if necessary;
- Number of location- and action-specific ARARs triggered (particularly land disposal restriction (LDR));
- Number of alternatives that need to be developed; and
- Content and quality of the alternatives array document to be included in the FS Report.

7.4 HOW TO OVERSEE THE DEVELOPMENT AND SCREENING OF ALTERNATIVES

During pre-RI/FS negotiation scoping, the RPM and oversight assistant should have developed a nondetailed conceptual model and identified preliminary site objectives, including site remediation goals. During post-AOC scoping, the conceptual model and site objectives, and remediation goals may have been modified by EPA, or in limited cases by the PRPs and approved by EPA. Modifications may have been included in the PRP Project Plans and used to help determine the need to perform field activities. During the development and screening process, PRPs use existing data from all of the planning and field activities, and the site performance standards established by the oversight team, to devise a list of alternatives that address how to treat or control all hazardous substances at the site, including any residuals.

The RPM and the oversight assistant can oversee the PRPs' development and screening of alternatives by performing the activities described in the following sections.

Oversight Team Meeting

Meet with the oversight team to establish site performance standards and review the PRPs' refined conceptual model and site objectives, including remediation goals, for consistency with performance standards.

Relevant Guidance

Supply the PRPs (and subcontractors) with relevant guidance. Give the PRPs an example of an alternative array document and the contents of an alternative description. The description of each alternative should address the following:

- Approximate volumes of material to be remediated;
- Implementation of requirements and timetables;
- Method of remediation and general response actions for each medium;
- Remedial technologies (treatment or containment) and process options;
- Monitoring procedures;
- Capital, operation and maintenance (O & M) costs;
- Need for 5-year review; and
- ARARs triggered (particularly LDRs).

Focus the FS

Use the NCP expectations (see Figure 2-5, Program Overview) to focus the FS on only those alternatives that are appropriate to the site circumstances, including the following:

- The site is straightforward and it would be inappropriate to develop a full range of alternatives;
- The need for prompt action outweighs the need to examine all appropriate alternatives (in this case, an interim or removal action would be the

appropriate avenue and an Engineering Evaluation/Cost Analysis (EE/CA) may be necessary); and

- ARARs, relevant guidance, or precedents at other sites indicate that there are only a limited number of alternative.

Note: The EE/CA is an analysis of removal alternatives conducted for a site when a removal action is appropriate.

ARARs and Technical Memoranda

Have the PRPs develop a list of action-specific ARARs and draft a technical memorandum documenting the revised remedial action objectives based on EPA's Baseline Risk Assessment. (Remember that chemical- and location-specific ARARs were developed in post-AOC scoping.) This technical memorandum needs to address source control actions and groundwater response actions.

Sources of ARAR guidance include:

- NCP Preamble, 55 Federal Register 8740-66 (March 8, 1990).
- CERCLA Compliance With Other Laws Manual, EPA/540/G-89/006, August 1988.
- CERCLA Compliance With Other Laws Manual, Part II. Clean Air Act and Other Environmental Statutes and State Requirements, EPA/540/G-89/009, August 1989.

Meeting

Conduct a meeting with oversight assistant and TST (including State), to discuss the ARARs identified for the site and how the PRPs can meet these ARARs (or obtain a waiver).

Range of Alternatives

Review the PRPs' range of alternatives against the program goals and expectations (see the preamble to the final NCP, 55 Federal Register 8666, pp. 8702-8707, or Section 300.430(a)(1)(iii)) to see if the PRPs' proposed technologies can help guide the development of alternatives, as well as satisfy the individual site objectives so that the PRPs fully consider the most promising alternatives. (See the RI/FS Guidance for an example of a generic alternative development process. Also see Figure 4-2.)

Screened Alternatives

Review the PRPs' screened alternatives (if the number of alternatives requires screening) to ensure that alternatives satisfy the NCP's cost, effectiveness and implementability criteria. Examine how the alternatives will meet Federal and State ARARs or whether a waiver of ARARs will be necessary. (See the RI/FS Guidance for an example of the screening process.)

Technical Memoranda Review

Review, with the oversight assistant and members of the TST, the content of the technical memorandum summarizing the work performed and the results of each activity, including the alternative array document.

Administrative Record File Document the development and screening process in the Administrative Record File and compile information for cost recovery documentation.

Fact Sheet If appropriate, have the oversight assistant or PRP create a fact sheet to release to the public on the results of the development and screening process.

7.5 DELIVERABLES DURING DEVELOPMENT AND SCREENING OF ALTERNATIVES

The RPM approves and comments on the PRPs' Technical Memorandum Documenting the Revised Remedial Action Objectives and the Technical Memorandum on Remedial Technologies, Alternatives, and Screening. The RPM will verify that these deliverables answer the following types of questions:

- Memorandum Documenting the Revised Remedial Action Objectives
  - Does this memorandum specify each contaminant and media of concern?
  - Does this memorandum identify each exposure route and receptor?
  - Does this memorandum identify EPA's remediation goals for each exposure route?
- Memorandum on Remedial Technologies, Alternatives, and Screening
  - Does this memorandum identify which media are affected and how the response actions, remedial technologies (including innovative technologies), and representative process options are developed for each medium?
  - Did the PRPs consider NCP expectations to develop the alternatives?
  - Does the PRP range of alternatives address, as needed, the appropriate site controls - treatment, engineering (or containment), institutional, or a combination of treatment, engineering, or institutional - and a no-action alternative?
  - Did the PRPs screen the alternatives using grossly excessive cost, effectiveness, and implementability in accordance with the NCP Section 300.430(e)(7)?
  - Does a preliminary review suggest that each alternative will meet identified ARARs or that a waiver of ARARs will be appropriate?
  - Does this memorandum contain complete descriptions of each alternative and an alternatives array document?
  - Was there noncompliance which warrants notification to the PRPs and, if necessary, to EPA counsel?

7.6 FOR FURTHER INFORMATION

- National Contingency Plan (NCP), 40 CFR 300.430
- Guidance for Conducting RI/FS Under CERCLA, OSWER Directive No. 9355.3-01, Chapter 4, October 1988.
- The Feasibility Study - Development and Screening of Remedial Action Alternatives, OSWER Directive No. 9355.3-01FS3, November 1989.
- Enforcement Project Management Handbook, OSWER Directive No. 9837.2-A, January 1991.
- Model Statement of Work for RI/FS Conducted by PRPs, OSWER Directive No. 9835.8, June 2, 1989.
- CERCLA Compliance With Other Laws, OSWER Directive No. 9234.1-010, August 8, 1988.
- CERCLA Compliance With Other Laws Manual: Part II. Clean Air Act and Other Environmental Statutes and State Requirements, OSWER Directive No. 9234.1-02, August 1989.
- Compendium of Technologies Used in Treatment of Hazardous Wastes, EPA/625/8-87/014, September 1, 1987.

7.7 RESOURCES AVAILABLE TO THE RPM

Personnel

- Regional Staff (Peer Review, TST, ORC, ESD).
- Oversight Assistant.
- ORD (Technology Support Centers, START and SITE Programs, Technology Forum Representatives).
- Headquarters Staff (OWPE, OGC, OE - Superfund Division).
- Other Federal Agencies (ERT, USCOE).
- States.

Documents

- Project Plans (Work Plan, SAP, HSP).
- Site Characterization Summary.
- Baseline Risk Assessment Report.
- Treatability Study Evaluation Report.
- Draft RI Report.

Data

- List of remedial action objectives.
- List of remedial technologies.
- List of Federal and State ARARs.
- Site Characterization Data.
- Baseline Risk Assessment Data.
- Treatability Study Data.

7.8 HELPFUL HINTS FOR THE RPM

During the alternatives development and screening task, the RPM should address the following:

- Alternatives that address worst problems first;
- Alternatives that follow the NCP expectations;
- Alternatives that are not grossly excessive in cost, are effective and implementable, and practicable; and
- Alternatives that satisfy site objectives.

To help minimize the time spent on developing and screening of alternatives, the RPM should:

- Focus, during post-AOC scoping, on the PRPs' preliminary list of alternatives in its Project Plans;
- Supply the PRPs with an alternative array document and an outline for each alternative's description;
- Verify the PRPs' action-specific and location-specific ARARs with the oversight assistant and TST (including State and other Federal agencies);
- Review the PRPs' screening process to identify alternatives that satisfy cost, effectiveness, and implementability criteria in NCP Section 300.430(e)(7);
- Realize that in certain site situations, the PRPs will not need to develop a full range of alternatives for each contaminant or medium of concern; and
- Notify PRPs and, if necessary, EPA counsel of any noncompliance in performing this task.

CHAPTER 8

DETAILED ANALYSIS OF ALTERNATIVES

8.1 INTRODUCTION

Detailed analysis of developed and screened alternatives is the final task of the FS prior to issuance of the draft and final FS Report. Detailed analysis involves evaluating each screened alternative against EPA's set of nine evaluation criteria and then comparing the relative performance of the alternatives against the criteria. The nine evaluation criteria should serve as a tool for selecting the appropriate remedy. The aim of the RPM is to document the detailed analysis through review and approval of a PRP-generated memorandum, which summarizes the results of the comparative analysis. The PRPs develop a draft and final FS Report, which also requires EPA review and approval.

8.2 PURPOSE AND GOAL FOR THE RPM

During the detailed analysis of alternatives, the PRPs evaluate how the screened alternatives compare with EPA's nine evaluation criteria. The PRP also should compare each of the screened alternatives against eachother to identify the key tradeoffs between the potential remedies. A viable remedy will be an alternative that is protective of human health and the environment, complies with or justifies a waiver of ARARs, is cost-effective, and utilizes permanent solutions and alternative treatment technologies to the maximum extent practicable.

8.3 TIMEFRAME

The detailed analysis of alternatives, like the development and screening phases, is a non-field activity that can take up to two months. The completion of the detailed analysis, however, is dependent on the following:

- Size or complexity of the site;
- Number and range of alternatives; and
- Content and quality of the detailed analysis study in a PRP memorandum and a draft and final FS Report.

8.4 HOW TO OVERSEE THE DETAILED ANALYSIS OF ALTERNATIVES

During the previous task of developing and screening alternatives, alternatives were identified that satisfy the cost, effectiveness, and implementability criteria. The PRPs now evaluate each screened alternative against EPA's nine evaluation criteria (see Figure 8-1) where each criterion is given equal weight. As part of this evaluation, the PRPs compare each screened alternative against each other and identifies any key tradeoffs that may be helpful to consider during the selection of remedy phase.

Figure 8-1. Summary of Nine Evaluation Criteria

	For additional information on the Nine Evaluation Criteria, see the NCP, 40 CFR 300.430(d)
1.	Overall protection of human health and the environment — describes how existing and potential risks from pathways of concern are eliminated, reduced, or controlled through treatment, engineering controls, institutional controls or by a combination of controls.
2.	Compliance with ARARs — addresses whether an alternative meets its respective chemical-, location-, and action-specific requirements or can invoke a waiver for an ARAR.
3.	Long-term effectiveness and permanence — evaluates performance alternatives in protecting human health and the environment after response objectives have been met and includes: – Magnitude of residual risk (untreated waste and treatment residuals) – Adequacy and reliability of controls (engineering and institutional) used to manage untreated waste and treatment residuals over time.
4.	Reduction of toxicity, mobility, or volume through treatment — assesses performance of alternatives in terms of reducing toxicity, mobility, or volume through treatment and whether or not statutory preference for treatment as a principal element is satisfied.
5.	Short-term effectiveness — addresses the impacts of alternatives on human health and the environment during construction and implementation until response objectives are met and the length of time until protection is achieved.
6.	Implementability — assesses degree of difficulty and uncertainties with undertaking specific technical and administrative steps and the availability of various service and materials.
7.	Cost — addresses costs of construction (capital) and necessary costs of operation and maintenance (present worth analysis assumes 10 percent discount rate, and the period of performance for costing purposes should not exceed 30 years).
8.	State (support agency) acceptance — evaluates technical and administrative issues and concerns the support agency may have regarding each of the alternatives.
9.	Community acceptance — evaluates issues and concerns the community may have for each alternative.

The RPM and oversight assistant can oversee the detailed analysis of alternatives by performing the activities described in the following sections.

Relevant Guidance

Supply the PRPs (and subcontractors) with relevant guidance. Give the PRPs a good example of a detailed analysis memorandum and an FS Report.

Screened Alternatives

Review the PRPs' analysis of each screened alternative against each of EPA's nine evaluation criteria with the oversight contractor and TST.

Note: This is a qualitative evaluation where each criterion is evaluated on a relative basis.

Note: The oversight team should scrutinize any containment-only remedies and determine if there are any "hot spots" of contamination that should be addressed through treatment.

Comparative Analysis

Review the PRPs' comparative analysis of alternatives against each other and identify key tradeoffs (strengths and weaknesses) among the alternatives.

Management Review

Conduct a management review meeting with Regional managers, oversight assistant, TST, and State to review the comparative study in the detailed analysis memorandum and FS Report.

Administrative Record File

Document the FS report in the Administrative Record File and update expenses for cost recovery documentation purposes.

Fact Sheet

If appropriate, develop a fact sheet or assign it to the oversight assistant to allow public input and/or conduct a public meeting on the FS Report. (Alternatively, public input on the FS Report can be obtained in conjunction with the Proposed Plan.)

Final FS Report

Consider comments on the FS Report from the State and incorporate these comments, if applicable, into the final FS Report.

8.5 DELIVERABLES DURING THE DETAILED ANALYSIS OF ALTERNATIVES

During the detailed analysis task, the RPM reviews and approves the following PRP deliverables: the Technical Memorandum Summarizing the Results of the Individual and Comparative Analyses of Alternatives and the draft and final FS Report. The RPM should verify that these deliverables answer questions in the following areas:

- Memorandum Summarizing the Results of the Comparative Analysis of Alternatives
  - Does this memorandum address each of the nine evaluation criteria?

- Does this memorandum include a comparison of alternatives against each other to identify tradeoffs?

- Draft FS Report

  - Similar questions as above.

  - Are the strengths and weaknesses of the different alternatives clearly described between each other?

8.6 FOR FURTHER INFORMATION

- National Contingency Plan (NCP), 40 CFR 300.430(d).
- Guidance for Conducting RI/FS Under CERCLA, OSWER Directive No. 9355.3-01, Chapter 6, October 1988.
- Enforcement Project Management Handbook, OSWER Directive No. 9837.2-A, January 1991.
- Model Statement Work for RI/FS Conducted by PRPs, OSWER Directive No. 9835.8, June 2, 1989.
- CERCLA Compliance With Other Laws, OSWER Directive No. 9234.1-010, August 8, 1988.
- CERCLA Compliance With Other Laws Manual: Part II. Clean Air Act and Other Environmental Statutes and State Requirements, OSWER Directive No. 9234.1-02, August 1989.
- Compendium of Technologies Used in Treatment of Hazardous Wastes, EPA/625/8-87/014, September 1, 1987.

8.7 RESOURCES AVAILABLE TO THE RPM

Personnel

- Regional Staff (Peer Review, TST, ORC, ESD).
- Oversight Assistant.
- ORD (Technology Support Centers, START and SITE Programs, Technology Forum Representatives).
- Headquarters Staff (OWPE, OGC, OE - Superfund Division).
- Other Federal Agencies (ERT, USCOE).
- States.

Documents

- Project Plans (Work Plan, SAP, HSP).
- Site Characterization Summary.
- Baseline Risk Assessment Report.

- Treatability Study Evaluation Report.
- Draft RI Report.
- Revised Remedial Action Objectives Memorandum.
- Remedial Technologies, Alternatives, and Screening Memorandum.

Data

- List of revised remedial action objectives.
- List of revised remedial technologies.
- List of Federal and State ARARs.
- Site Characterization Data.
- Baseline Risk Assessment Data.
- Treatability Study Data.
- List of Screened Alternatives, if applicable.

8.8 HELPFUL HINTS FOR THE RPM

During the detailed analysis of alternatives task, the RPM should ensure that:

- PRPs addresses all nine criteria in its detailed analysis;
- PRPs compares each screened alternative against each other;
- RPM receives input from the oversight assistant, TST (including State), and the Regional management review team on the completeness of the detailed analysis;
- PRPs are not slanting analysis of alternatives, without the appropriate justification, towards no or little action;
- PRPs are not slanting analysis of alternatives, without the appropriate justification, towards the least costly remedy; and
- Alternatives are protective of human health and the environment and meet ARAR(s) or can qualify for a waiver of ARARs.

The RPM can help minimize the time spent on the detailed analysis of alternatives by:

- Supplying the PRPs with sample documents of a detailed analysis technical memorandum and an FS Report;
- Ensuring that the PRP analyzes each screened alternative against each of the nine evaluation criteria without assigning greater weight to any criterion;

- Ensuring that the PRPs perform the comparative analysis of screened alternatives against each other to identify individual advantages and disadvantages and tradeoffs; and

- Reviewing, with the oversight assistant, TST (including State), and the Regional management review team, the quality and content of the detailed analysis memorandum and the draft and final FS Report; and

- Notifying PRPs and, if necessary, EPA counsel of any noncompliance in performing this task.

APPENDIX A

TECHNICAL RESOURCES AVAILABLE THROUGHOUT THE RI/FS

Although the EPA remedial project manager (RPM) is ultimately responsible for overseeing a remedial investigation/feasibility study (RI/FS) led by potentially responsible parties (PRPs), the RPM has many different technical resources available to assist with or carry out the RI/FS oversight. These include resources from within the EPA Regional office, EPA Headquarters offices, EPA contractors and consultants, other Federal agencies and departments, and State and local governments.

Chapter 1.1 of this guidance addresses the role of the RPM and his or her designated oversight assistant. This appendix helps to identify further resources that can assist the RPM and oversight assistant during the different phases of the RI/FS. Obtaining access to a resource for oversight activities may require the RPM to have funds available to transfer to the selected resource. The RPM may also be required to complete work-initiation forms and attach a Statement of Work (SOW) or work assignment. In all cases, it is important for the RPM to identify during the pre-RI/FS negotiation scoping phase the oversight resources that will be most appropriate and the requirements for obtaining access to them.

A.1 HEADQUARTERS ASSISTANCE

Office of Waste Programs Enforcement (OWPE) - The CERCLA Enforcement Division can assist in the review of legal or technical documents or respond to questions about oversight implementation or procedures. OWPE Regional Coordinators should be the prime point of contact.

• CERCLA Enforcement Division	(FTS) 398-8404 or (703) 308-8404
• Guidance and Evaluation Branch	(FTS) 475-6770
• Compliance Branch (Regional Coordinators)	(FTS) 398-8484 or (703) 308-8484

Office of Emergency and Remedial Response (OERR) - The Hazardous Site Control Division (HSCD) can assist in the review of technical documents or respond to questions on implementing procedures for Fund-lead sites. HSCD publishes the "Superfund Records of Decision (ROD) Update" to aid RPMs in developing RODs by providing useful information and a means for RPMs with similar site issues to interact. OERR Regional Coordinators should be the prime point of contact.

• Hazardous Site Control Division	(FTS) 398-8313 or (703) 308-8813
• Remedial Operations and Guidance Branch	(FTS) 398-8444 or (703) 308-8444
• Design and Construction Management Branch	(FTS) 475-6707 or (703) 308-8393

•	State and Local Coordination Branch	(FTS) 398-8380 or (703) 308-8380

Office of General Counsel (OGC) - *OGC can provide assistance in reviewing* legal or technical documents or respond to questions about oversight implementation, NCP procedures, or legal questions under CERCLA. Generally, contact with OGC is made through the Office of Regional Counsel (ORC) or *OWPE/OERR Regional Coordinators.*

Office of Enforcement (OE) - OE can provide additional assistance in reviewing legal documents responding to legal questions about CERCLA, NCP procedures, and oversight implementation, and taking enforcement actions. In addition, the Regional Coordinators for Federal facilities are now in OE. Generally, contact with OE is made through each Region's ORC.

Office of Research and Development (ORD) - *Contact with ORD* can be made through the ORD Regional liaison in each Regional office. ORD is located in Headquarters or in one of the following Technical Support Centers:

- Risk Reduction Engineering Laboratory (RREL) Center for Engineering Programs and Treatability Studies in Cincinnati, OH. The center can assist in planning and researching for Engineering and Treatment Support, *Treatability Assistance Program* (TAP), and the Superfund Technical Assistance Remedial Technology (START) team, (FTS) 684-7406.

- Environmental Research Laboratory (ERL), Center for Exposure Assessment and Ecological Risk Technology Support in Athens, GA. This includes the Center for Exposure Assessment Modeling (CEAM), (FTS) 250-3134.

- Robert S. Kerr Environmental Research Laboratory (RSKERL) Center for Groundwater Fate and Transport in Ada, OK. The laboratory includes the Subsurface Remediator Information Clearinghouse in Ada and the International Groundwater Modeling Center at the Holcomb Research Institute in Indianapolis, IN, (FTS) 743-2224.

- Environmental Monitoring Systems Laboratory (EMSL) Center for Monitoring and Site Characterization in Las Vegas, NV, (FTS) 545-2523.

- Environmental Criteria and Assessment Office (ECAO), Center for Health and Risk Assessment in Cincinnati, OH, (FTS) 629-4173.

- Other environmental research laboratories are located in Narragansett, RI; (FTS) 838-6001; Gulf Breeze, FL; (FTS) 686-9011; Duluth, MN; (FTS) 780-5549; and Corvallis, OR, (FTS) 420-4601.

Technical assistance is also available through the following programs:

- The RREL Superfund Innovative Technology Evaluation (SITE) program can assist in conducting or reviewing treatability studies, screening/analyzing remedial alternatives, and bench/pilot/full-scale testing of remediation technologies. Access to SITE is obtained by contacting the ORD Regional liaison (ORD employees) located in each Region.

- Groundwater and Engineering Technical Support Forums. Representatives from Groundwater Fate and Transport and Engineering and Treatment Forums transfer information between the Technical Support Centers and the Regions. Most forums are informal sessions organized by Regional Section Chiefs.

National Enforcement Investigations Center (NEIC) - serves as the principal source of expertise for civil and criminal litigation, and technical support. NEIC access usually requires an oral request from a Superfund Branch Chief. The center, located in Denver, can be reached at (FTS) 776-5100.

A.2 REGIONAL AND NON-EPA ASSISTANCE

RPMs have a wide variety of resources available in the Regional offices. Initial access to these resources usually requires informal contact (phone call or visit) between the RPM and staff members in the desired office or division.

Peer Review - Regional in-house peer review can help in responding to specific technical questions or reviewing technical memoranda and reports (sometimes exists as a technical support section).

Environmental Services Division (ESD) - Regional ESDs can review site project plans, oversee field activities, provide blank and spiked samples for quality assurance, and conduct laboratory and field audits. ESD can oversee activities up to and including performance of the RI.

Environmental Response Team (ERT) in Edison, NJ - ERT can provide assistance in conducting and overseeing removal and remedial actions. ERT's capabilities include review of site project plans and reports, oversight of field activities, review of conceptual designs, and provision of expert testimony.

Office of Regional Counsel (ORC) - ORC provides primary assistance to the RPM in reviewing legal documents negotiating orders and decrees, making referrals to the Department of Justice (DOJ), and taking enforcement actions.

Water Division - Regional Water Division provides information on surface water and drinking water concerns from the following areas: Office of Groundwater Protection, Water Quality Planning and Standards Section, Water Supply Section, Toxicology, and Wetlands.

Air Division - Regional Air Division provides information on air emission and ambient air standards from the following areas: Toxic Substances Control Act-PCBs, Modeling, and Air Toxics.

Waste Management Division - Regional Waste Management Division provides information on Resource Conservation and Recovery Act waste management requirements.

Public Affairs - Regional Public Affairs is helpful in disseminating information to States, local governments, and the community. For example, the Community Relations Coordinator (usually not in Public Affairs Office) can assist in implementing a community relations plan (CRP).

A.3 REGIONAL CONTRACTS

EPA maintains several contracts with architectural and engineering firms to assist EPA Headquarters and Regions in implementing the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA). These level-of-effort (LOE) contracts allow specific tasks to be assigned to the contractor on an as-needed basis, within the restrictions of the overall contract SOW and within the technical labor hours and dollar ceilings established by the contract.

Technical Enforcement Support (TES) Contracts - These are the primary contracts for overseeing PRPs during CERCLA response activities. These LOE contracts allow specific tasks to be assigned to the contractor on an as-needed basis, within the restrictions of the overall contract and within the technical labor hours and dollar ceilings established by the contract. Oversight tasks assigned to TES contractors include the following:

- Financial assessments;
- Expert witness/consultant;
- Technical review of documents;
- Records compilation;
- Risk assessment;
- Oversight of field activities, including compliance monitoring;
- Sampling analysis;
- Evidence storage/preservation;
- Special studies;
- Design development, placement, and data evaluation for groundwater monitoring wells;
- Design and implementation of surface and subsurface site investigations;
- Collection and evaluation of evidence on PRP waste activity;
- Development of negotiation and litigation strategies;
- Evaluation of PRP settlement offers;

- Development of mechanisms for financing PRP settlements; and
- Design and preparation of technical assistance training programs on oversight for RPMs.

These tasks are assigned to the contractor through individual written work assignments that contain SOWs, delivery schedules, and other performance schedules. Questions regarding access to TES contractors should be directed to the appropriate regional contact. Additional information on TES contracts can be obtained from the "TES User Guide," June 1987 and the forthcoming updated "TES User Guide" (planned for early 1992).

Alternative Remedial Contracts Strategy (ARCS) - This program also is used for overseeing PRPs during CERCLA response actions. The ARCS contracts are also LOE based. The contracts under this program provide remedial planning, design, and implementation, as well as site-specific project management and other technical and management assistance. The ARCS program incorporated the contracts previously covered by the Remedial Engineering Management (REM) program. The types of oversight tasks that may be assigned to an ARCS contractor include the following:

- Project planning;
- Remedial oversight;
- Risk assessment;
- Sample analysis and validation;
- Enforcement support;
- Community relations; and
- Data management.

Questions regarding access to ARCS contractors should be directed to the appropriate Regional contact.

Field Investigation Team (FIT) Contracts - Contractors in this program can assist in collecting and reviewing preliminary assessment/site investigation (PA/SI) data, scoping and planning schedules, field oversight of site characterization, and report review. FIT is accessed by issuing a work assignment through developing a SOW, and working with the Regional FIT contracting officer.

Technical Assistance Team (TAT) Contracts - This program can assist in removal actions, oversight of removal actions, and planning and scoping for interim measures. TAT is accessed by issuing a work assignment through developing a SOW, and working with the Regional TAT contracting officer.

Emergency Response Cleanup Services (ERCS) Contracts - This program can assist in emergency response, spill response, oversight of removal actions, and planning and scoping activities. ERCS is accessed by issuing a work assignment through developing a SOW, and working with the Regional ERCS contracting officer.

Contracting Laboratory Program (CLP) - This program is a major source of analytical data for use in the RI and Baseline Risk Assessments. CLP is a nationwide network of contractor laboratories and a major vehicle for Superfund analysis, especially to provide routine analytical services (RAS) and special analytical services (SAS). When a non-CLP laboratory is chosen at PRP-lead sites, CLP is responsible for using split samples as quality assurance (QA) and quality control (QC) procedures to verify the accountability and accuracy of the sampling procedures employed at the site. At a minimum, for enforcement considerations, 10 percent of the samples should be split and sent to a CLP lab.

For information regarding the CLP, contact the Analytical Operations Branch of OERR at FTS 382-7906 or the Sample Management Office at (703) 684-5678. Additional contacts can be obtained from the fact sheet, Contract Laboratory Program (OSWER Directive No. 9200.5-320 F/S, September 1990).

A.4 OTHER FEDERAL AGENCIES

RPMs also can obtain oversight assistance from other Federal agencies. This generally requires RPMs to reallocate funds to the appropriate agency through an interagency agreement (IAG). These IAGs usually are executed in coordination with a Regional contact in the Region's Superfund Contracts and Administration Section.

Agency for Toxic Substances and Disease Registry (ATSDR) - A part of the Centers for Disease Control, ATSDR can assist in determining current or potential risk to human health that exists at a site. The regional ATSDR representative should be contacted during pre-PRP negotiation and, if possible, should be a member of the Technical Support Team (TST).

Department of Defense (DOD) - The U.S. Army Corps of Engineers (USCOE) - can provide the following:

- Expert witness during RI/FS negotiation and litigation;
- Oversight of field activities;
- Hydrogeologic studies;
- Treatability Studies; and
- Other special studies.

Department of Interior (DOI) - The U.S. Fish and Wildlife Service (USFWS) - can provide the following:

- Expert witness during RI/FS negotiation and litigation;
- Natural resource endangerment studies; and
- Preliminary Natural Resource Surveys (for migratory birds, federally listed threatened and endangered species, anadromous fish, Federal minerals, National Park land, and Tribal Trust resources).

DOI - The U.S. Geological Survey (USGS) - can provide the following:

- Expert witness during RI/FS negotiation and litigation;
- Oversight of field activities during RI;
- Hydrogeologic studies; and
- Other special studies.

U.S. Department of Agriculture (USDA) - USDA can provide expertise in managing agricultural, forest, and wilderness areas. In addition, the Soil Conservation Service (SCS) can help predict fate and transport of pollutants in soil, and can provide expertise for the TST when soils are contaminated.

Department of Commerce (DOC) - National Oceanic and Atmospheric Administration (NOAA) - NOAA can provide information on meteorologic, hydrologic, ice, and oceanographic conditions for marine, coastal, and inland waters and can provide expertise on certain living marine resources and their habitats.

Department of Energy (DOE) - DOE can assist in identifying, removing, and disposing of radioactive contamination.

Department of Health and Human Services (HHS) - HHS can assist in assessing site health hazards and protecting site personnel and public health.

Department of Justice (DOJ) - DOJ represents the Federal government in litigation. The Land and Natural Resources division commonly is involved in environmental litigation.

Department of Labor (DOL) - DOL can assist in identifying Occupational Safety and Health Administration (OSHA) requirements for hazardous waste sites.

Department of Transportation (DOT) - DOT can assist in identifying requirements for the manifesting and transport of hazardous waste and materials (see Appendix B in Volume 2 of this manual).

A.5 DATABASES

There are a number of databases available to RPMs through the Regional libraries or through personal computer (PC)-modem (phone-line) connections from PCs in their sections. These include commercial, EPA, and other Federal and State databases. Described below are several of the primary databases that can assist RPMs with PRP oversight. They generally can be divided into three types:

- Those that track similar components of response actions or case histories at other sites;
- Those that provide detailed sources of data to support the many types of analyses associated with an RI/FS; and

- Those that serve as bulletin boards and provide technology transfer and information on other resources.

Tracking Case History Databases

Enforcement Document Retrieval System (EDRS) - EDRS is menu-driven and allows the user to search through EPA enforcement documents by document category, specified time period, or specified law, or by any word or set of words within the document text. Three types of documents are routinely updated: policies and procedures, administrative enforcement, and judicial action. The system can be accessed by terminals that are direct-wired to EPA's National Computer Center (NCC) in Research Triangle Park. For additional information, check the EDRS User's Manual, the Regional EDRS Contact in ORC, or call OE at (FTS) 382-2614.

Hazardous Waste Casefinder System (Casefinder) - The Casefinder includes the hazardous waste cases found or cited in the Federal Reporter system, the Hazardous Waste Litigation Reporter, the Toxics Law Reporter, the Chemical Waste Litigation Reporter, the Environmental Law Reporter, and a considerable number of important unreported cases. As of October 1987, 700 Federal court opinions had been categorized and entered into the Casefinder. New cases are added monthly. In order to use Casefinder, the user must have a valid user ID to access the NCC in Research Triangle Park. For additional information concerning Casefinder, contact the OE at EPA Headquarters.

RODS Database - RODS contains Superfund Records of Decision (ROD), which describe the planned course of action to clean up a site. The database, installed on a mainframe at EPA's NCC in Research Triangle Park, allows searching for selected information from ROD documents or National Technical Information System (NTIS) Abstracts. Access is via modem from a PC. Register through the RODS Hotline at (202) 252-0056.

Expert Resources Inventory System (ERIS) - ERIS is a searchable database that contains resumes in summary form and information on qualifications, area of expertise, and previous experience of specialists available as expert witnesses or consultants to support hazardous waste enforcement actions. The database had been classified as "enforcement confidential" and is protected under the Privacy Act of 1974. The database may be accessed by EPA and DOJ staff upon request. Users should contact the EPA OWPE for information on accessing the database.

Hazardous Waste Collection Database (HWCD) - HWCD is a bibliographic database containing abstracts of EPA and other government agency reports, commercial books, policy and guidance directives, legislation, and regulations concerning hazardous waste, is searchable by subject; and has a database thesaurus to aid users in designing efficient searches. The database is available through the EPA library system.

Technical Analysis Databases

Alternative Treatment Technology Information Center (ATTIC) - The ATTIC system is designed to provide technical information on alternative methods of hazardous waste treatment. ATTIC is available through any modem-equipped IBM-compatible PC using standard communications software. The core of the ATTIC system is the ATTIC database, a keyword-driven system that contains technical information in the form of abstracts or report summaries from a variety of sources including the SITE program, States, industry, DOD/DOE, RODS Database, and treatability studies. Other databases contained in the ATTIC system that can be directly accessed include:

- RREL (Water) Treatability Database.
- RSKERL Soil Transport and Fate Database.
- EPA Library Hazardous Waste Collection Database.
- Cost of Remedial Action (CORA) Model.
- Geophysics Advisor Expert System.

Also available through ATTIC is the Computerized On-Line Information System (COLIS) and its three databases: Case File History, Library Search System, and SITE Application Analysis Report File. To access ATTIC, contact the ORD Regional liaison in your Region or the ATTIC system operator at (301) 816-9153.

Integrated Risk Information System (IRIS) - IRIS contains health risk data, bibliographic and textual information on risk management, water quality criteria, and drinking water standards. It is available on-line through EPA's electronic mail system (E-MAIL). To access IRIS through E-MAIL, after signing on, type "IRIS" at the ">" prompt.

ORD Superfund Remediation Information (SRI) Database - SRI contains information pertaining to fate, transport, and in-place treatability of contaminants in subsurface environments. SRI can be used to locate other information sources pertinent to reclamation of contaminated soils and ground waters, including planned, active, and completed subsurface remediations. Users need to contact the ORD RSKERL in Ada, OK, to access the system.

ORD Aid for Evaluating the Redevelopment of Industrial Sites (AERIS) - AERIS helps make risk-based cleanup calculations at industrial sites. AERIS evaluates on-site costs for one chemical, one receptor, one land use, and one environmental setting. It relies on data from past soil contamination. Users need to contact the ORD RSKERL in Ada, OK, to access the system.

Technical Information Exchange (TIX) - TIX is a compiled database available on diskettes to EPA Regional and contracts personnel and State personnel. TIX provides a complete file of each applications analysis for technologies evaluated under the Superfund Innovative Technology Evaluation (SITE) program. Diskettes are available from Hugh Masters of EPA ORD at FTS 340-6678.

RISK*ASSISTANT - RISK*ASSISTANT is a microcomputer software system designed to help assess health risks posed by hazardous waste. RISK*ASSISTANT is not a substitute for expert evaluation, but provides easy-to-use databases and analytical tools that screen potential hazards, exposures, and risks at hazardous waste sites. RISK*ASSISTANT was developed by the Hampshire Research Institute, (703) 683-6695, in conjunction with the Office of Health and Environmental Assessment (OHEA).

CERCLA Scheduling and Cost Estimating Expert System (SCEES) - SCEES is an expert system under development to provide site-specific Superfund Comprehensive Action Plan (SCAP) quality schedule and cost estimates for the RI/FS process. SCEES is a tool for determining timely resource and

scheduling estimates. For more information on SCEES, contact the CERCLA program office.

Commercial Databases - DIALOG, Chemical Information System, and BRS Search Services are examples of commercial databases that abstract information relevant to EPA's hazardous and solid waste programs and are searchable free of charge via EPA Headquarters and Regional librarians. For more information, contact your Regional librarian.

A.6 COMPUTER-BASED BULLETIN BOARD

OSWER Electronic Bulletin Board System (BBS) - OSWER BBS facilitates communication and the dissemination of information among EPA staff in Regional offices, Headquarters, and research laboratories. To use the OSWER BBS, the user needs a PC or terminal, a modem, and a communications program. To access the OSWER BBS, dial (202) 589-8366 or (301) 589-8366 after setting CrossTalk parameters to 8 data bits, 1 stop bit, and no parity. Choose a password, complete an on-line registration questionnaire, and within 24 hours you will be a registered user with full access to all features of the system. The BBS is available to EPA staff and current contractors and State and Federal agency personnel.

Major features of the OSWER BBS include the following:

- Information bulletins.
- Message exchange.
- File exchange.
- Technical publications ordering.
- On-line databases and directories.

A.7 HOTLINES

EPA Headquarters has established several national telephone hotlines that can be used by anyone in need of technical assistance or wishing to report findings. Additional Regional, State, or commercial hotlines may also be available.

RCRA/Superfund Hotline
National Toll-Free 800-424-9346

EPA's largest and busiest toll-free number, the RCRA/Superfund Hotline answers nearly 100,000 questions and document requests each year. Hotline specialists answer regulatory and technical questions and provide documents on virtually all aspects of the RCRA and Superfund programs. Because of the complexity and changing nature of these programs, the hotline is used widely by the regulated community, people involved in managing and cleaning up hazardous waste, Federal, State, and local governments, and the general public. The RCRA/Superfund Hotline can be reached Monday through Friday from 8:30 a.m. to 4:30 p.m. Eastern Standard Time (EST).

Federal Facilities Docket Hotline
National Toll-Free 800-548-1016
Washington, D.C., Metro 703-883-8577

Operated by the EPA Office of Federal Facilities Enforcement (OFFE), the hotline has been in service since 1988. The hotline responds to specific questions about Federal facility compliance with the docket requirements outlined in Section 120 of CERCLA, as amended. The hotline can be accessed Monday through Friday from 8:30 a.m. to 5:30 p.m. EST.

National Response Center Hotline
National Toll-Free 800-424-8802
Washington, D.C., Metro 202-426-2675

Operated by the U.S. Coast Guard, the National Response Center Hotline responds to all kinds of accidental releases of oil and hazardous substances. This hotline is available 24 hours a day, 7 days a week, every day of the year.

Chemical Emergency Preparedness Program (CEPP) Hotline
National Toll-Free 800-535-0202
Washington, D.C., Metro and Alaska 202-479-2449

The CEPP Hotline has been in operation since late 1985, responding to questions concerning community preparedness for chemical accidents. The Superfund Amendments and Reauthorization Act (SARA) increased the CEPP Hotline's responsibilities, which now also include Emergency Planning and Community Right-to-Know and SARA Title III questions and requests. The CEPP Hotline, which complements the RCRA/Superfund Hotline, is maintained as an information resource rather than an emergency number. Calls are answered Monday through Friday from 8:30 a.m. to 4:30 p.m. EST.

National Pesticides Telecommunications Network (NPTN)
National Toll-Free 800-858-7378
(858 -P-E-S-T)
Texas 806-743-3091

Operating 24 hours a day, 7 days a week, every day of the year, the NPTN provides information about pesticides to the medical, veterinary, and professional communities as well as to Federal agencies and the general public. Originally a service for physicians wanting information on pesticide toxicology and on recognition and management of pesticide poisoning, the NPTN has expanded to serve the public and Federal agencies by providing impartial information on pesticide products, basic safety practices, health and environmental effects, and cleanup and disposal procedures. Staffed by pesticide specialists at Texas Technical University's Health Sciences Center School of Medicine, this hotline handles about 18,000 calls each year.

Small Business Hotline
National Toll-Free 800-368-5888
Washington, D.C., Metro 703-557-1938

Sponsored by the EPA Small Business Ombudsman's Program, this hotline assists small business in complying with environmental laws and EPA regulations. The Small Business Hotline gives companies easy access to EPA, and investigates and resolves problems and disputes with EPA. Acting as a

liaison with Agency program offices, the hotline ensures that EPA considers small business issues during its normal regulatory activities. The Small Business Hotline operates Monday through Friday from 8:30 a.m. to 5 p.m. EST, handling over 7,000 inquiries each year.

Safe Drinking Water Hotline
National Toll-Free 800-426-4791
Washington, D.C., Metro 202-382-5533

The EPA's Safe Drinking Water Hotline began operating in July 1987. Its primary function is to assist the public and the regulated community, including Federal facilities, in understanding EPA's regulations and programs developed in response to the Safe Drinking Water Act Amendments of 1986. The hotline service provides information on EPA's drinking water programs, including the Public Water Supply (PWS) and Underground Injection Control (UIC) programs. The hotline operates Monday through Friday (except Federal holidays) from 8:30 a.m. to 4:30 p.m., EST.

Inspector General's Whistle Blower Hotline
National Toll-Free 800-424-4000
Washington, D.C., Metro 202-382-4977

The EPA Inspector General's Office maintains the Whistle-Blower Hotline to receive reports of EPA-related waste, fraud, abuse, or mismanagement from the public and from EPA and other government employees. EPA employees may make complaints or give information to the Inspector General's Office confidentially and without fear of reprisal. The Whistle-Blower Hotline is staffed to answer calls in person from 10 a.m. to 3 p.m. EST, Monday through Friday. At other times, callers may leave a message to be answered during the next work day. The hotline handles about 1,500 calls each year.

TSCA Assistance Information Service
Washington, D.C., Metro
202-554-1404

The TSCA Assistance Information Service provides information on TSCA regulations to the chemical industry, labor and trade organizations, environmental groups, Federal facilities, and the general public. Technical and general information is available. To help facilities comply with TSCA, a variety of services are offered, including regulatory advice and aid, publications, and audio-visual materials. The TSCA Assistance Information Service now handles about 2,500 calls a month and can be reached from 8:30 a.m. to 5 p.m. EST, Monday through Friday.

A.8 PUBLICATIONS

There are several compendiums and catalogs of Superfund and hazardous waste reference materials, guidances, and other publications. RPMs should check with the Regional or Headquarters librarian for these publications or sources indicated below.

Catalog of Superfund Program Publications - OSWER Directive No. 9200.7-02A, October 1990 (85 pages). This catalog provides a reference to policy, procedural, and technical directives and publications governing the Superfund program. Regular-supplements are planned. Publications abstracted must be

have copies. Copies of the catalog may be obtained from the Superfund Document Center by writing the Superfund Documents Coordinator (OS-240), U.S. EPA, 401 M St. S.W., Washington, DC 20460.

OSWER Directives - System Catalog - OSWER Directive No. 9013.15-3D (30 pages). Provides a list of OSWER Directives published through June 1988. Each Region also has an OSWER Directive Coordinator.

Superfund Risk Assessment Information Directory - OSWER Directive No. *9285.6-1 (202 pages). Publication Number EPA/540/1-86/061. The directory* identifies and describes sources of information useful in conducting risk assessments. The directory covers sources of information to aid in hazard identification, dose-response assessments, exposure assessments, and risk characterization. Available from the Superfund Document Center.

Annotated Technical Reference for Hazardous Waste Sites

Contact: OWPE CERCLA Guidance and Evaluation Branch, at (FTS) 475-6770.

This reference, though still in draft, provides information on 14 common site types: asbestos, battery recycling/lead, dioxins, landfills, metals, mining wastes, mixed waste, multi-source ground water, munitions, PCBs, pesticides, plating, solvents, and wood preserving. Other information is directed at ARARs, risk assessments, and summaries of typical site characterizations. This reference provides access to technical expertise through lists of Regional technical experts and technical references.

CERCLA Administrative Records: Compendium of Frequently Used Guidance Documents in Selecting Response Actions

Contact: OWPE, CERCLA Guidance and Evaluation Branch, FTS 475-6770, or Regional Administrative Records Coordinator

This reference serves as a central library of guidance documents in each Region. It saves resources by avoiding the need to copy such documents for each administrative record.

Accessing Superfund Guidance Documents

U.S. EPA staff can obtain reports, fact sheets, or directives (OERR/OWPE) from the Superfund Document Center by calling FTS 382-5628. Rule making and Federal Register listings can be obtained from the Superfund Docket by calling FTS 382-3046. Information on innovative technologies can be obtained from the Treatment Innovation Office (TIO) by calling (703) 308-8800. Many documents can be ordered from the Center for Environmental Research Information (CERI) by calling FTS 684-7562. State personnel may order documents from NTIS by calling (703) 487-4650.