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Guidance for Scoping the Remedial Design

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GUIDANCE FOR SCOPING THE REMEDIAL DESIGN

Office of Emergency and Remedial Response
U.S. Environmental Protection Agency
Washington, DC 20460

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PREFACE

This *Guidance for Scoping the Remedial Design* provides, for EPA's Remedial Project Managers (RPMs), information about preparing the Statement of Work (SOW) to facilitate remedial design for Superfund cleanup projects (both Fund-lead and Enforcement-lead). It includes instruction for preparing a Project Management Plan, remediation schedules, cost estimates, and model SOWs for oversight of Fund-lead projects and for RD oversight. The *Guidance* applies to Superfund Accelerated Cleanup Model (SACM) projects as well. The Appendixes provide schedules and forms that will be useful in assisting RPMs to develop complete, detailed guidance for contractors tasked with implementing remedial design and remedial action activities.

Questions, comments, and/or recommendations concerning this manual are welcomed and should be forwarded to:

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EXECUTIVE SUMMARY

This *Guidance for Scoping the Remedial Design* describes the activities to be performed in the predesign planning phase of the Superfund remedial process. The planning process involves the synthesis of information from the Record of Decision (ROD) and other supporting documents to determine and define (scope) EPA's technical and managerial requirements for the development of the remedial design (RD) and the implementation of remedial action (RA).

The *Guidance* presents information to help in performing the basic predesign activities as follows:

- Preparing the RD/RA management plan
- Collecting predesign technical information
- Developing approximate RD schedules
- Preparing Independent Government Cost Estimates (IGCEs) for RD work assignments to be performed by contractors
- Developing the Statement of Work (SOW) for the RD
- Developing an SOW for the oversight of RDs conducted by Potentially Responsible Parties.

This guidance manual is organized to lead the Remedial Project Manager through the logical progression of tasks to be performed as preparation to develop an SOW for the RD.

CHAPTER 1

INTRODUCTION

PURPOSE OF THIS GUIDANCE

This *Guidance for Scoping the Remedial Design* describes the activities to be performed in the predesign planning phase of the Superfund remedial process. This Guidance will also apply to Superfund Accelerated Cleanup Model (SACM) projects such as non-time-critical removals and non-emergency early actions. Predesign planning takes place after the Record of Decision (ROD) has been signed. However, many of the appropriate activities can be performed before signing the ROD to expedite the project. The planning process involves the synthesis of information from the ROD and other supporting documents to scope EPA's technical and managerial requirements for the development of the remedial design (RD) and the implementation of remedial action (RA).

This Guidance is addressed to EPA's Remedial Project Managers (RPMs). It also should be of interest to the other possible participants (States, other Government agencies, or Potentially Responsible Parties (PRPs)) in the RD process in that the Guidance describes some of their roles and responsibilities. The RPM's role in the RD scoping process will vary depending on the RD contracting party (i.e., the party that orders the services) that is designated as the choice to be the lead party. Exhibit 1-1 depicts how the choice of the lead or a contracting party affects the RD process.

The Guidance presents information for performing the basic predesign activities, including the following:

- Performance of RD/RA management planning
- Collection of predesign technical information
- Development of approximate RD schedules
- Preparation of Independent Government Cost Estimates (IGCEs) for RD work assignments to be performed by contractors
- Development of the Statement of Work (SOW) for the RD
- Development of an SOW for the oversight of PRP-conducted RDs

RPM RESPONSIBILITIES

Depending on the RD contracting party, you, as RPM, will be faced with slightly varying responsibilities, which include developing cost estimates and negotiation. In general, responsibilities can be described under three different lead RD groupings, because in all three cases you will be responsible for

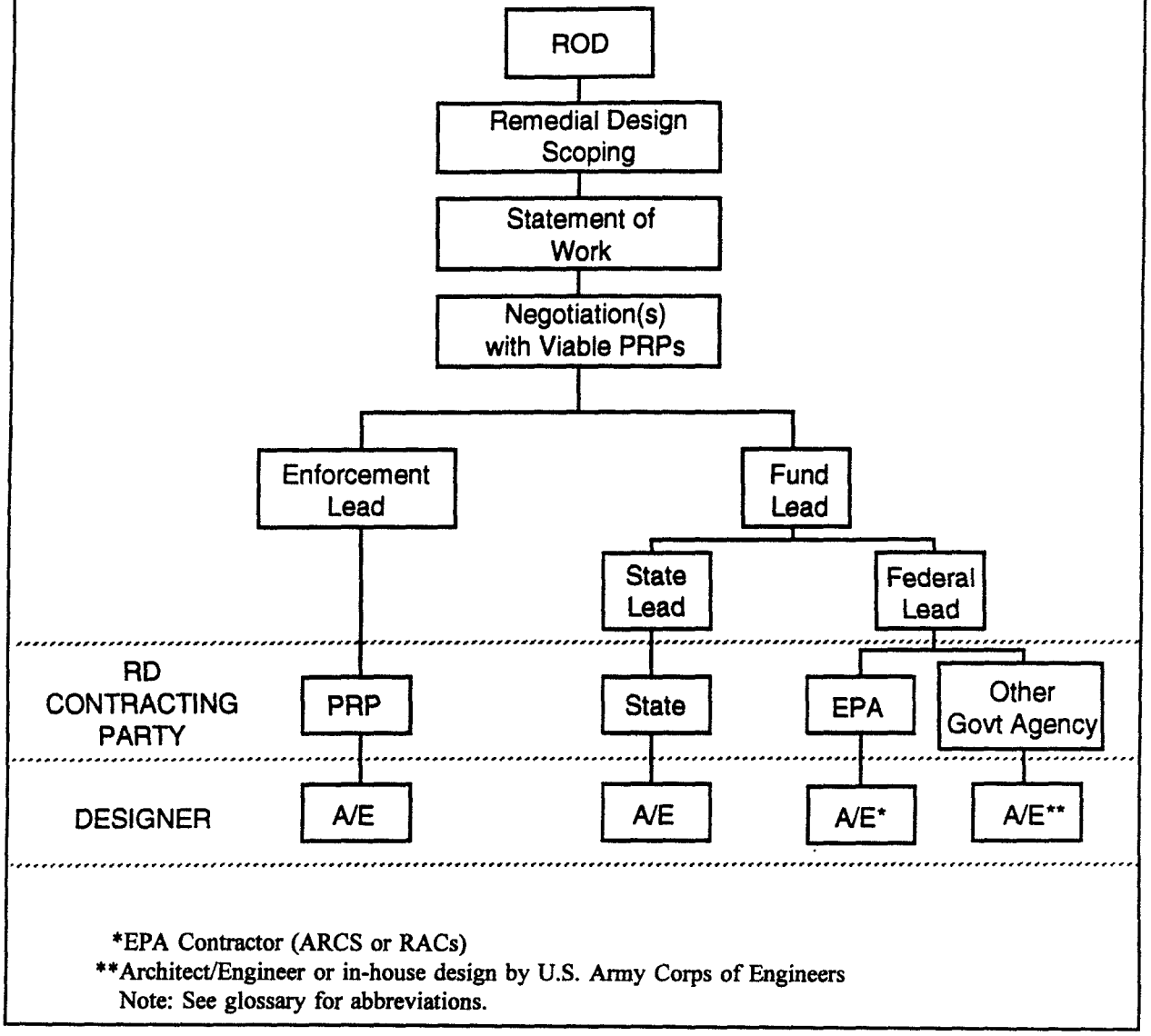
- Developing the Project Management Plan (Chapter 2)
- Collecting predesign technical information (Chapter 3)
- Refining the RD schedule (Chapter 4)
- Drafting the SOW (Chapter 6)

EPA as the Contracting Party

For EPA-lead sites (i.e., where EPA is the contracting party), you are responsible for preparing the SOW, a design schedule, and an IGCE. Guidance for preparing an IGCE appears in Chapter 5. These documents will be used in developing a work assignment to be issued to the designer. Under no circumstances shall the IGCE be made available to the designer. The designer will then prepare and submit to the EPA contracting officer a Work Plan addressing the items in the SOW, including discussion of any need to vary from the SOW. The designer's Work Plan will also include a proposed schedule and cost estimate. You will review the Work Plan for consistency with the SOW and will compare the designer's schedule and cost estimate with the independently prepared Government documents.

You will assist the Contracting Officer in negotiating with the designer to resolve any significant differences in the proposed design

Exhibit 1-1
The RD Process With Different Leads



*EPA Contractor (ARCS or RACs)
**Architect/Engineer or in-house design by U.S. Army Corps of Engineers
Note: See glossary for abbreviations.

schedule or estimated cost. When agreement is reached, you will prepare the Work Plan approval package. This package should include documentation of any required deviation from the SOW or changes to the IGCE. Once the package is completed, you will forward it through the Project Officer to the Contracting Officer for approval.

State or Other Government Agency as the Contracting Party

As was the case for EPA as the contracting party, you will be responsible for preparing a comprehensive SOW, a design schedule, and an IGCE. The SOW, schedule, and IGCE will be used to develop either a cooperative agreement (with a State, Indian tribe, or locality) or an interagency agreement. The State or agency will reach a separate agreement with the designer to carry out the work.

PRP as the Contracting Party

For Enforcement-lead projects (i.e., where the PRP is the contracting party), you will be responsible for preparing an SOW (using the information contained in the ROD) and an RD schedule. The SOW, including the schedule of deliverables, will become an appendix to the Consent Decree. A cost estimate and SOW will also be needed for the performance of EPA RD oversight activities, usually by a Response Action Contracts (RACs) contractor.

Preparation of the SOW for Remedial Design

This guidance manual has been organized to lead you through the logical progression of tasks that are performed as preliminary preparation for the development of an SOW for the RD. Thus, even though the specific guidance for developing the SOW is described in Chapter 6, all the earlier chapters will be preparation for completion of the SOW. In effect, by the time you have completed the preliminary tasks, much of the work required for the actual preparation of the SOW will have been accomplished.

Preparation of the SOW for Remedial Design Oversight

A model SOW for the performance of RD oversight activities for Enforcement-lead projects has been provided for your use (Appendix E) in preparing a site-specific, comprehensive RD oversight SOW. Oversight activities and the preparation of the oversight SOW are described in Chapter 7.

CHAPTER 2

DEVELOPING A PROJECT MANAGEMENT PLAN

CHAPTER OVERVIEW

The purpose of this chapter is to provide you, the Remedial Project Manager (RPM), with an overview of the management options available for remedial design (RD) and remedial action (RA) to achieve the goals of the Record of Decision (ROD) in a timely manner. You should consider these options and develop a Project Management Plan prior to the initiation of the RD. The decisions made throughout the development of the Project Management Plan will be incorporated into the Statement of Work (SOW) and, ultimately, into the designer's Work Plan. The Project Management Plan is an evolving document and should be updated on a regular basis as the project becomes more defined. The U.S. Army Corps of Engineers (USACE) conducts similar planning exercises and, although the content is slightly varied, these plans are made available to you for review before you initiate the RD/RA.

PLANNING ACTIVITIES

The key to effective project management is planning. You must devote adequate attention to the initial planning activities (before the RD begins) to ensure that the RD can proceed on time and within budget. During this transition period between the ROD and the development of the RD SOW, you should be concerned with undertaking the following activities (described in more detail below):

- Establish the technical review team.
- Develop the Project Management Plan.
- Update budget and schedule in CERCLIS (Comprehensive Environmental, Response, Compensation, and Liability Information System).

Establishing the Technical Review Team

The complexity of a typical RD/RA project requires in-depth knowledge of a variety of engineering and geological fields including chemical, structural, mechanical, and electrical engineering, as well as a knowledge of hydrogeology. Because it is unlikely that any single RPM will possess such a broad knowledge base, it is imperative that you assemble and coordinate a project team that incorporates technical knowledge in the applicable fields. The project "team" approach, which is used by other Federal agencies engaged in design and construction management (e.g., USACE), results in higher technical quality and improved project efficiency.

Before beginning a remedial design, review the nature of the project and select the appropriate technical assistance. Your technical review team may include Regional support staff (including ground-water, quality assurance/quality control (QA/QC), risk assessment, and engineering experts), other experienced RPMs, representatives from USACE, the State (who focus on Applicable or Relevant and Appropriate Requirements (ARARs) and permit requirements), EPA's Office of Research and Development (ORD), or other EPA offices such as Air, Water, and Solid Waste. It is important to obtain early involvement from the pertinent State or other agency that may have the expertise to assist in the interpretation of a regulation to ensure compliance with the substantive requirements.

When USACE has been tasked to manage the RD/RA contract, they will use the team approach by using their own in-house resources. You must identify additional resources, both internal and external, to ensure success. When issuing work assignments under EPA contracts (e.g., Alternative Remedial Contracts Strategies (ARCS), Response Action Contracts (RACs), Emergency Response Cleanup Services (ERCS), or Emergency and Rapid Response Services (ERRS)), the RPM should consider use of USACE to serve in a "technical assistance" capacity. Such external agencies have excellent technical resources and can be called upon to provide a wide variety of engineering and project management services that are not available from EPA. You may obtain services from USACE by preparing an interagency agreement (IAG) that will explain and authorize the services needed.

Developing the Project Management Plan

A successful project begins with the "owner" (i.e., EPA). The RPM, acting on EPA's behalf, is responsible for the quality of the project by virtue of establishing the project requirements and by communicating these requirements to the other team members (including the designer and the constructor). To summarize the requirements of the project fully, carefully consider all aspects of the project, make key decisions, and relay this information to those parties who are performing the work. To prepare for meeting this basic owner obligation, first develop a Project Management Plan, which is an analysis of the project's managerial goals and which includes the constraints of the remedy. The purpose of preparing the Plan is to devise a strategy for successfully delivering the project on time and within budget.

Exhibit 2-1 is an outline of the major managerial decisions to be addressed in the development of the Plan, The content, of course, will be modified depending on the complexity of the remedial design and remedial action. For simple projects, many of the requirements need not be addressed--the content and level of detail are left for you and the technical review team to determine. Some questions probably cannot be addressed until the design is under way. Therefore, it is important to continue to revisit the Project Management Plan and to revise it as necessary. It is advised that you seek technical assistance from experienced Regional staff or USACE when developing the Project Management Plan.

1. Specifying Organization and Communications

1.1 Determining Roles and Responsibilities

Establishing the Lead

Negotiations with viable PRPs always occur first after issuance of the ROD. If negotiations fail, the project then becomes Fund-lead and you will select the appropriate means of performing RD/RA. Regional policy may dictate when the State, USACE, or an EPA contractor will conduct RD/RA, For Fund-lead projects, the Office of Solid Waste and Emergency Response (OSWER) Directive 9242.3-08, dated December 10, 1991, mandated a maximum RA threshold of up to $15 million for issuing RA assignments to an EPA contractor; RAs estimated to exceed $15 million were to be assigned to USACE for construction management. RD assignments, however, could be made to either USACE or an EPA contractor at the Regions' discretion, regardless of estimated cost. The RPM should check the current policy. If an EPA contractor is selected, then you, with assistance from the Project Officer, will evaluate the success that a particular contractor has had on other projects. Although it may seem, on the surface, to be desirable to maintain continuity from the Remedial Investigation/Feasibility Study (RI/FS) through the RA by using the same EPA contractor, you are expected to carefully consider the available options. Base your final selection on the requirements of the project.

It is also possible for an EPA contractor to design the remedy, while USACE contracts for and manages the RA. In this case, USACE should be tasked to serve as technical advisors during the design and should be allowed to participate fully from post-ROD planning to SOW development to the development of the plans and specifications.

Assembling the Technical Review Team

Refer to the earlier section beginning on page 2-1 for discussion of the makeup of a technical review team.

1.2 Establishing a Communications Matrix

Effective communication is essential to the success of a project. Prepare and use a communications matrix that identifies the key team members and how information (including submittals, memoranda, documents, and approvals) flows among the members to ensure successful communication. Since this matrix may change upon discussion with the various team members, make sure all parties agree on the procedures before the remedial design commences. You will need to strike a balance so that the team members do not become inundated with too much information, thereby creating an unnecessary expenditure of effort in evaluating the information's significance to the project. It is usually advisable, however, to designate all parties to receive copies of trarismittals, letters, project notes, records of telephone conversations, etc., to keep everyone abreast of project activities.

Exhibit 2-1
Developing the Project Management Plan: Key Decisions

1. Specify the Organizational and Communications Structure

   - Determine roles and responsibilities
     - Establish the lead
     - Assemble the technical review team
   - Establish a communications matrix

2. Determine Project Constraints

   - Funding constraints
   - Schedule constraints
   - Other constraints
     (e.g., equipment/process availability, long-lead procurement, health and safety, predictable seasonal climate variations)

3. Develop a Contracting Strategy for RD/RA

   - Identify opportunities to accelerate the schedule
     - Phasing
     - Fast tracking
     - Use of preplaced contracts and prequalified contracts
   - Select the design approach*
     - Design specifications
     - Performance-based specifications
   - Identify the RA contract type*
     - Fixed price
     - Cost plus
     - Time and materials
     - Service versus construction contracts
       - effects on labor rates
       - bonding concerns
   - Develop the RA procurement strategy*
     - Competitive procurement
     - Sole-source procurement

   *If project is Fund-lead

2. Determining Project Constraints

You will face a number of constraints that can jeopardize timely project completion. By careful planning, you can minimize disruptions to the schedule. In this section, we offer you a list of the more common issues that can affect the schedule (and costs).

2.1 Funding Constraints

You must identify all known funding constraints in order to adequately scope the project. You are responsible for understanding and ascertaining

- Availability of funds for RD, RA, and operation and maintenance

- State cost share and obligations during future years

A shortage of RA funds for the project may result in the need to phase certain portions. (See section 3.1 of this chapter for an explanation of phasing and fast-tracking.) Additionally, for Fund-lead projects, a State's inability to fund operation and maintenance may affect design decisions. A cost-benefit analysis of capital versus operation and maintenance alternatives is always advisable. It is important to know in advance if low maintenance features should be clearly specified in order to prevent costly redesign efforts.

2.2 Schedule Constraints

Develop a schedule that contains the major milestones through RA completion. If available, use project management scheduling software to create the schedule. At this point in the process, the schedule will be in a preliminary form; it must be continually refined as the project develops. You must be aware of all schedule commitments that have been made so that you can factor them into the contracting decisionmaking process, Decisions made during the development of the Project Management Plan will also affect the schedule. In addition, several of the constraints listed below (section 2.3) could be seen as schedule constraints.

2.3 Other Constraints

The possible constraints to timely project completion are numerous. At this point, you need to identify as many roadblocks as possible that will affect the project schedule or the way the project is managed. Several issues are the most common and therefore worth highlighting for consideration. By carefully considering site-specific conditions, you can plan ahead to avoid later disruptions.

Regulations and Permits

Evaluate the logistical elements involving agencies that have jurisdiction over the site. The involvement of other agencies who are typically outside the Superfund realm can cause schedule delays. It is important to consider all possible players who may affect the RD/RA or threaten its timely completion. Other possible agencies may include

- Federal agencies (e.g., National Oceanic and Atmospheric Administration (NOAA), natural resource trustees, Housing and Urban Development (HUD))
- Local planning commissions
- Zoning authorities
- County or city building and safety departments
- Local water and wastewater authorities
- Local emergency planning and response units
- Public utilities
- Traffic and highway authorities
- State environmental offices

Health and Safety

The management of the health and safety program will affect completion of the project. The use of Level A or B Personal Protective Equipment (PPE) can affect productivity and, subsequently, the schedule. Furthermore, there may be periods during the year when factors such as harmful air emissions or stormwater runoff contamination make construction more difficult.

Equipment

The ROD may specify a process or remedy that requires special equipment or a sole-source procurement. For Fund-lead projects, it is important to evaluate the delivery schedule for the equipment. If you expect the procurement process to take a long time, consider purchasing the equipment under a separate contract to ensure timely delivery.

Access Needs

Identify access requirements as early as possible to evaluate or prevent possible delays in performing RD fieldwork.

*Community Involvement**

It is generally EPA's responsibility to ensure that community involvement activities are carefully planned. Significant delays can result from inadequate consideration of community concerns.

*Throughout this document, "community involvement" is used synonymously for "community relations."

Weather

When considering weather, it is necessary to evaluate not only the time of the year when the work will occur, but also the geographic location of the work site. Extreme temperatures, excessive rainfall, or high winds may make execution of an RA difficult. In the northern sections of the country, winter construction shutdowns are common.

Change in RPMs

Because some projects take a long time to complete, it is not uncommon to see a change in RPMs during the life of a project. To minimize disruption to the project, records (including the Project Management Plan) should be kept up to date in the event that the RPM is changed on short notice. Please use the modified Golden Rule: Document your actions for your successor as you would want your predecessor to have done for you.

3. Developing a Contracting Strategy for RD and RA

3.1 Opportunities To Accelerate the Schedule

EPA is committed to expediting cleanups at Superfund sites. Therefore, every project must be evaluated for opportunities to accelerate the schedule. In addition, any constraints identified in section 2 may require you to review and adjust the schedule accordingly. There are several methods of developing an optimum schedule to ensure an accelerated RA: phasing, fast-tracking, and the use of preplaced or prequalified contracts.

Phasing

The division of a project into meaningful work elements that can be implemented on different schedules usually results in acceleration of the RD and RA. This strategy, called phasing, allows certain elements of a project to be started ahead of others to lessen the hazards present at the site and to complete simple prerequisite work elements ahead of more complex and hazardous work elements. All elements are worked in unison, but each individual element has its own schedule and moves at its own rate through the process. Phasing is advantageous because the start of initial RA is always accelerated.

Use the following criteria to group RD/RA activities into discrete work elements:

- **Existing Information.** Certain aspects of the design such as road installation, utilities installation, and building demolition and removal can proceed while data on other aspects of the design are gathered.

- **Phasing by Type of Waste.** Segregation of nonhazardous and hazardous work elements may be a simple criterion for project phasing. The engineering required for the nonhazardous components of a project is frequently more conventional and may lend itself readily to accelerated schedules in RD and RA. Examples are access roads, fences, and utilities. In addition, these types of work elements are frequently prerequisites for more complex elements. It makes sense to begin their design and construction as early as possible in the project to ensure that completion does not delay subsequent work.

- **Phasing by Funding Availability.** As stated in section 2.1, funding constraints may create the need to phase an RA by using the concepts presented above. An example would be funding mobilization and construction of an incinerator as phase one, and incinerator operation as phase two.

Fast-Tracking

Phasing breaks down large, complex projects into smaller, more manageable work elements; fast-tracking accelerates the implementation of those individual work elements. Fast-tracking techniques manipulate the internal steps required to complete each phased element, thereby reducing the overall schedule.

You may choose among several techniques by which RD/RA can be fast-tracked:

- **Expediting RD.** Eliminate or shorten steps in the RD process. However, short-cutting involves the assumption of risk. The detail in an RD can be reduced, particularly for simple engineering efforts such as soil excavation or tank dismantling. The use of standard specifications can also expedite the RD.

- **Optimizing the RD Schedule.** Optimization is the rearrangement of the sequence of RD elements to enhance the overall schedule. For example:

  - The site preparation portion of a design (and other simple construction activities) can be completed and construction initiated while the rest of the design activities are ongoing.

  - All design reviews are scheduled in parallel with ongoing design work so they are not on the critical path.

  - The designer is required to submit design documents *as completed* in a process-logical order instead of retaining significant schematic or ROD interpretation documents until the "preliminary design" or "30-percent" phase is complete.

- **Fast-Track Construction.** Some projects can be divided into separate stages for construction purposes. This is generally accomplished by letting out each stage of work for construction as soon as the design is completed (e.g., site preparation, procurement of long-lead equipment, utilities installation).

Use of Preplaced or Prequalified Contracts

Using preplaced or prequalified contracts will eliminate the solicitation and audit requirements necessary for contract award, allowing construction activities to begin in only 30 to 60 days. Additionally, long delays because of bid protests or bonding difficulties are eliminated. The type of contract is heavily influenced by the amount of uncertainty in the work to be performed and should be selected to coincide with the amount of detail incorporated into the design. The major disadvantage of preplaced or prequalified contracts is the lack of competition.

3.2 Design Approach

Included in the RD documents are specifications that describe the technical requirements to be met by the RA contractor and the criteria for determining whether these requirements have been met. The two types of design specifications typically used within Superfund are Design and Performance-Based Specifications.

Design Specifications

Use design specifications in solicitations when the Government's technical requirements are definite and can be clearly communicated to bidders. Under design specifications, the Contracting Party is responsible for design and any related omissions, errors, and deficiencies in the specifications and drawings. Remedial actions that lend themselves to design specifications include landfill covers and traditional ground-water treatment systems. Detailed designs permit award solely on price and may result in a lower cost. Also, use of a detailed design specification is advantageous in that a firm without design capabilities can bid on the project, thereby expanding competition.

Performance-Based Specifications

Performance-based specifications set forth the operational requirements for item(s) being procured. They advise the RA contractor of what the final product must be capable of performing. If the RA contractor has undertaken an impossible task, meets technological problems, or cannot complete performance because of its lack of experience, the contractor bears the risk of loss. Performance-based specifications are typically used where a more complex treatment technology will be employed. The performance specification is generally more easily prepared and can result in a reduction in the time required to prepare the RD. However, additional time is usually required for evaluating the proposals submitted, and the additional risks assumed by the RA contractor usually result in higher construction costs.

3.3 The RA Contract (for Fund-lead projects)

The *Federal Acquisition Regulation* (FAR) defines the system that the United States Government must use to obtain contractual services. There are four general types of contracts available under FAR: fixed price, cost reimbursement, time and materials, and indefinite quantity. The two types of contracts most commonly used are fixed price and cost reimbursement. The use of fixed-price contracts forces the Government to do a thorough investigation and design before solicitation. The benefit of this work is twofold: it results in a contract that minimizes risk to the Government and

that has the lowest price at the time of award for comparable technical quality. In contrast, the use of cost-reimbursement contracts allows for expedited solicitation while placing greater demands on the Government in terms of contract administration, risk allocation, and potential cost.

Fixed-Price Contracts

Fixed-price contracts (lump sum, unit price, or a combination of the two) establish a firm price for the supplies, services, equipment, or construction being acquired. In fixed-price contracts, the ceiling or target price is adjusted only when an event occurs or a contingency arises that can cause a modification, as stated in the contract. Public agencies use only fixed-price contracts in acquisitions made by selecting from sealed bids.

Lump sum. A lump-sum (firm-fixed-price) contract is an agreement to pay the contractor a specified price in return for certain specified performance. The price paid is not subject to adjustment as a result of the cost history developed during performance of the contract. The contractor's profit or loss is related entirely to its ability to control costs. Since this type of contract places the maximum risk and cost responsibility upon the contractor, it provides the contractor with the maximum incentive for effective performance. The resultant benefit is increased profits. Because the contractor's cost experience is not a factor in determining compensation under the contract, the administrative costs to both the contractor and the public agency are kept to a minimum.

The lump-sum (firm-fixed-price) contract is used when reasonably definite specifications are available and whenever fair and reasonable prices can be established at the outset. This type of contract is especially suited to the acquisition of supplies, services, equipment, and construction where realistic cost estimates can be made. However, if the contractor has to place a significant contingency factor in its contract price to cover fluctuations in labor or material costs, or to protect itself from its inability to estimate the costs, then the use of a lump-sum (firm-fixed-price) contract is not appropriate.

Unit price. In a unit-price contract, the selection of the offeror of the lowest bid is based on estimated quantities, whereas payments to the successful offeror are based on actual quantities. That is, the sum to be paid is the aggregate total determined by the quantity of work actually performed, calculated according to the unit price set out in the offer. If the estimated quantities are faulty, an offer may be mathematically unbalanced by an offeror who recognizes the real situation and who, consequently, may attempt to gain an evaluation advantage by offering high on the underestimated units and low on the overestimated units. The solicitation should state that if there is reasonable doubt that an award would result in the lowest cost to the agency (materially unbalanced), then the offer may be considered nonresponsive. Also, a clause should be included in the contract that would permit the negotiation of any unit price when the following changes occur: (1) changes in quantities exceed 15 percent of the estimated quantity, and (2) the change in price for that item is significant.

The unit-price contract shifts some of the cost risk away from the contractor. Therefore, the burden is on the agency to ensure that the estimated quantities are a reasonably accurate representation of the actual anticipated needs in light of relevant factors and past experience. The estimated quantities should offer a reasonable probability that award to the offeror of the lowest bid will, in fact, result in the lowest ultimate cost to the agency.

Cost-Reimbursement Contracts

The cost-reimbursement contract provides for payment to the contractor of all (or sometimes a portion of) its allowable costs. In addition to costs, these contracts provide for the payment of a fee to the contractor. Cost-reimbursement contracts establish an estimate of total cost for the purpose of obligating funds and establishing a cost ceiling. The contractor must notify the public agency when costs approach the ceiling, for the contractor may not exceed the ceiling (except at its expense) without the prior approval or subsequent ratification by the public agency. When the contractor's costs reach the cost ceiling, it must stop and await further instructions from the agency. A cost-reimbursement contract may allow a project to be fast-tracked from the ROD into RA; however, its use requires enhanced oversight to more closely monitor contract costs. Cost-reimbursement contracts are suitable for use when the costs of performance cannot be estimated with the accuracy necessary for a fixed-price contract. The cost risk falls on the public agency.

Time and Materials Contracts

Time and materials contracts may be obtained by using either sealed bids or negotiated procurements. The Government selects this type of contract when it is not possible at the time of contract preparation to accurately estimate the scope (extent or duration) of work required. The contract calls for the provision of direct labor hours at an hourly rate and the provision of materials at a designated cost. The proposal documents contain estimated quantities for bid evaluation purposes. Time and materials contracts require the use of time and cost standards applicable to the particular work items and require appropriate surveillance by Government personnel.

Indefinite Quantity Contracts

Indefinite quantity contracts are like time and materials contracts in that they may be obtained using either sealed bids or negotiated procurements. The Government uses this type of contract when it is impossible to determine in advance the precise quantities of supplies or services that will be needed for designated activities during a definite contract performance period. The method of ordering work must be stated, as well as minimum/maximum orders allowable during a specific time period. In order to provide a basis of cost for items to be ordered, regulations require the development of a fixed-unit-price schedule (SOW) before award. The bid proposal contains estimated quantities for bid evaluation purposes.

Separation of Construction and Service Activities

For Fund-lead projects, whether a remedial action is determined to be construction (construction, alteration, or repair, including dredging, excavating, and painting) or service (operating a treatment unit) will affect the labor wage rates and bonding concerns. The plans and specifications should distinguish between the two types of activities so that appropriate labor wage rates (Davis-Bacon rates for construction and Service Wage rates for service) can be applied. For construction work funded in whole or in part under Section 104(g)(1) of the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA), the law requires that all laborers and mechanics employed by contractors be paid wages at rates not less than those prevailing on projects of a similar character within the same locality as determined by the Secretary of Labor in accordance with the Davis-Bacon Act.

Federal construction projects require RA constructors to post performance and payment bonds. Historically, bonds have been difficult to obtain when the remedial action exceeded $20 million. Separating the remedial action into service and construction activities results in lower overall cost of the construction and increases the chances for the potential RA constructors to obtain bonds.

3.4 RA Procurement Strategies

Competitive Procurement

EPA's *Guidance on Expediting Remedial Design and Remedial Actions* (EPA/540/G-90/006, August 1990) states that

> The strategy for expediting procurement methods is to match the appropriate procurement method to the type of work being procured. For example, the fastest procurement is when sealed bidding is used to procure work for which standard specifications are available. The time required to put together the invitation for bids is short because it simply involves joining standard contract documents to standard specifications along with a description of the work. Standard specifications are available for a broad variety of work including such items as water mains, wells, pumping systems, some treatment processes, and various types of earth work. If these items are part of a project, then the expediting strategy should include the possibility of separating them out and procuring them through sealed bidding.
>
> On the other hand, sealed bidding can be a slow method of procurement if used for complex work for which standard specifications do not exist. The slowness is caused by the need to develop detailed design specifications. Under these circumstances, it may be faster to use the negotiated procurement method with performance specifications, which require less technical detail. The contractor then submits within his proposal a plan for the development of detailed specifications after the award of the contract. Therefore, the award of the contract for complex work will usually occur sooner if the negotiated procurement method is used. Another procurement method discussed below, two-step sealed bidding, is similar to negotiated in this respect; that is, it is suitable for complex work for which no standard specifications exist.

Considering the above discussion, one time-saving procurement method is to look for significant work elements which can be procured early by way of sealed bidding with standard specifications. This can be done at the same time that requests for proposals are being developed for the more complex portions of the project, In this manner, the appropriate procurement method is matched to specific type of work with the result that each work element is awarded in the shortest possible time. This process assumes that the various elements of work are large enough to warrant separate procurement actions, and that construction schedule issues are taken into consideration.

Descriptions of the essential features of each procurement method can be found on pp. 32–39 of the *Guidance on Expediting Remedial Design and Remedial Actions*. Recommended procurement strategies for the various categories of remediation are provided as Exhibit 2-2.

Sole-Source Procurement

The use of sole-source or noncompetitive procurement is the least favored method of obtaining an item or service. Thus, the use of sole-source procurement is prohibited except in the following four cases:

(1) The item is available from only a single source.
(2) A public exigency or emergency exists, justifying its use.
(3) Competition is inadequate.
(4) The EPA award official authorizes it.

To use sole-source procurement, the RPM must adequately justify the need for it. Brand name and performance specifications sometimes disguise what is really a sole-source procurement. If only one brand of equipment can meet the specification, this results in a disguised sole source.

FAR requirements for sole-source procurement are found in FAR Subpart 6.3. The FAR has specific procedures that must be met, including obtaining the approval of the EPA's "Competition Advocate" (FAR 6.5) before procurement.

Updating Budget and Schedule

First you must establish a preliminary budget and schedule for the project. This information must be incorporated into CERCLIS by the Region to ensure that funding is available when the design process begins and to facilitate other planning and project management activities. These estimated costs and dates are intended to serve merely as benchmarks; however, they should be periodically refined and updated in CERCLIS as they become more detailed and accurate. Failure to update CERCLIS will hinder efforts to properly fund and schedule the project, possibly resulting in work stoppages, scheduling delays, cost overruns, and a general reduction in project quality.

Once the ROD is signed, review the budget and schedule for both remedial design and remedial action for accuracy. Budget considerations for a PRP-lead site might include ensuring sufficient funding for oversight activities and community involvement needs. Consult with the Independent Government Cost Estimate (IGCE) Coordinator, the Information Management Coordinator, or other experienced staff in the Region to ensure consistency with similar ongoing projects and available historical cost data.

Exhibit 2-2
Recommended Procurement Strategies for Hazardous Waste Remediation

Remediation Schedule	Specification	Procurement	Contact
Ground-Water Treatment—Complex	• Design • Performance	• Two-Step Bid • Request for Proposal	• Fixed Price • Indefinite Quantity • Time and Materials • Cost Reimbursement
Ground-Water Treatment—Simple	• Design	• Invitation for Bid	• Fixed Price
Treatment of Soils and Sludge—Complex	• Design • Performance • Functional	• Two-Step Bid • Request for Proposal	• Fixed Price • Indefinite Quantity • Time and Materials • Cost Reimbursement
Treatment of Soils and Sludge—Simple	• Design	• Invitation for Bid	• Fixed Price
Civil Engineering—Complex	• Design • Performance	• Two-Step Bid • Request for Proposal	• Fixed Price • Indefinite Quantity • Cost Reimbursement
Civil Engineering—Simple	• Design	• Invitation for Bid	• Fixed Price
On-Site Thermal Destruction	• Performance • Functional	• Request for Proposal	• Fixed Price • Indefinite Quantity • Time and Materials • Cost Reimbursement

Adapted from the technical paper titled "Acquisition Selection for Hazardous Waste Remediation" by William R. Zobel, PE.

CHAPTER 3

INFORMATION COLLECTION

CHAPTER OVERVIEW

As Remedial Project Manager, you should compile existing predesign information to facilitate a smooth transition from the Record of Decision (ROD) to the remedial design (RD) process and to provide the remedial designer with a clear understanding of the technical objectives of the RD. The information will serve as the initial building block for developing the RD Statement of Work (SOW) for both Fund-lead and Enforcement-lead projects.

The listing of collected data will serve as an up-to-date inventory of any information pertinent to the RD. Provide the list to the designer as an appendix to the SOW. This will make it possible for both you and the designer to identify additional predesign information needs and will enable them to plan for the budgeting and scheduling requirements.

It is your responsibility to be as thorough as possible in providing all relevant information. It remains the responsibility of the designer, however, to verify the completeness of the information provided to ensure that the data will yield a design that when implemented will meet all Applicable or Relevant and Appropriate Requirements (ARARs). Exhibit 3-1 lists the nine major categories of information that should be collected.

DATA COMPILATION

Relevant data are needed by the designer in order to understand the objectives of the RD. The data will be collected by means of the following activities:

- Define current site conditions.
- Describe the selected remedy.
- Identify applicable regulatory requirements.
- Summarize available data and identify possible additional data needs (or treatability studies not performed for the Feasibility Study (FS)).
- State all known, unresolved issues.

The primary information sources include the Remedial Investigation/Feasibility Study (RI/FS) and the ROD, along with any other relevant documents available to you. Document the information sources that you use.

For Fund-lead sites, you may obtain much of the information you need through a predesign discussion session. This meeting, which should be held soon after the ROD is signed, will involve you, in-house technical experts, the RI/FS contractor, and other Regional personnel with prior experience in design and construction activities. It may also include representatives from other Government agencies, the State, and the designer. Discussion topics should include design-limiting site conditions, the availability and need for additional data, the need to define treatment schemes or processes, the need for treatability studies, the selected design approach and milestone dates, and the existence of any unresolved issues.

Exhibit 3-1
RD Information Collection Categories

Site Conditions

Performance Standards

Availability of Data

Technology and Design Approach

Materials

ARARs/Permits/State Involvement

Unresolved Issues

Health and Safety Concerns

Miscellaneous Concerns

In listing sources of technical information, consider the following points:

- Keep the narrative brief.
- Use bulleted points whenever possible.
- Provide references to sources of information (title and description of document, document number, revision number, date).
- Present pertinent data in logically organized tables.
- Provide flow diagrams to describe treatment schemes or processes for the selected remedy.
- Provide supporting information either as attachments or as a list of references.

We discuss the potential data items to be collected in the pages that follow. It is left to your discretion and that of the review team to determine the content and level of detail for the information provided under each topical heading. For simple design projects, many of the items need not be addressed. Whenever this is the case, headings for unused sections should be retained for consistency and followed by the words "NOT USED."

Site Conditions

1. Site Description

Provide a brief description of the site and past and present site activities, including reference to any previous or ongoing removal or remedial activities. There is no need to rewrite this information if it can be referenced in the ROD.

1.1 Site History and Current Status

Provide a summary of background information that would be useful to the designer. Include a brief description of the dimensions, location, and history of the site; the level of contamination found in each medium; and other pertinent facts about the site in general. Also identify the time period for which the description applies. The designer will know whether there has been sufficient delay between the assembling of predesign technical information and the start of the design to require an update the site status. Mention any individuals who have useful knowledge of the site.

1.2 Chemical, Physical, and Geological Characteristics of Site

Provide a brief description of the general topography (rolling, flat, steep slopes), types of soil, vegetation, geologic characteristics (depth to bedrock), depth to ground water, areas of contamination, and any unusual features known about the site. These features need to be described only if they are not satisfactorily described in the RI, FS, or ROD.

1.3 Proximity to Homes and Schools, and Land and Ground-Water Use Surrounding Site

Provide a description of the distances to the nearest residences, schools, or businesses. Possible or preferred access routes should also be described. Also include a brief description of the surrounding land and ground-water usage.

The designer will use this information (1) to estimate the extent to which contingency planning will be necessary during the RD and remedial action (RA) phases, and (2) to evaluate the need for perimeter monitoring, noise reduction controls, siting arrangements, or temporary relocation of affected residents.

1.4 Basis for Property Lines on Drawings

Indicate, whenever possible, whether property lines shown on existing topographic (topo) maps, drawings, or sketches of the site are based on an actual site survey or merely scaled from existing drawings, field sketches, or topo maps. (Scaled measurements are less reliable, since they can be in error by 25 feet or more.)

Indicate whether the site has been mapped for the project and whether field notes are available. Alternatively, to indicate the level of accuracy of site drawings, note any existing topographical data obtained by others (e.g., U.S. Geological Survey) that have been used for the RI/FS.

1.5 Likely Future Use of Site

Provide a description, if known, of the proposed future use of the site. This information makes it

easier for the designer to tailor the design to future needs.

2. Real Estate Issues

2.1 Real Estate Requirements Assessment

Obtain an assessment of real estate issues in the form of a Real Estate Planning Report (REPR). The REPR will provide information on real estate properties or easements that must be acquired or from which residents must be relocated before RA proceeds. Real estate information includes data on estimated acreage, number of owners and their names, property value, problems, and the need for temporary relocation of affected residents or businesses. Make arrangements for completion of the REPR before preparing the preliminary design (submitted when approximately 30 percent of the design is complete) by either the designer or the U.S. Army Corps of Engineers (USACE) under an interagency agreement (IAG).

2.2 Real Estate and Access Issues

Point out any restrictions or special agreements made with State or local officials or property owners. Special agreements might include requirements such as the following:

- Limiting the use of a primary access road to certain times of the day to minimize the disruption to local traffic
- Limiting excessive noise and traffic congestion by using alternative transportation routes for equipment and materials
- Strengthening a bridge so that it may provide an access route for heavy construction vehicles
- Using or acquiring property that could affect the design or restrict the construction

3. Availability of Utilities

3.1 Location and Availability

Describe the location, if known, of any utilities (gas, electric, water, sewer, Publicly Owned Treatment Works (POTW), and telephone) available for use at the site. When known, include information on the maximum capacity of each utility and the name and telephone number of a contact person. This information probably can be obtained from the preparer of the RI/FS.

3.2 Existing Agreements or Conditions

Describe any discussions or agreements made with a utility or local boards. Include the date of the discussion and the name of the representative(s) who attended the meeting.

Performance Standards

For each medium to be addressed (e.g., soil, ground water, air) include, if appropriate, the following information on the ROD's remediation standards, goals, requirements, or objectives:

- Clearly defined treatment or performance standards
- Applicable point(s) of compliance (e.g., 5 ppm trichloroethylene (TCE) in ground water at the discharge point to the stream)
- Percentage or order of magnitude reduction expected from treatment
- Best Demonstrated Available Treatments (BDATs)
- Maximum discharge levels to be attained throughout the plume/soil matrix, at property boundaries, or at the point of release into surface water or air
- Specific types of analyses (Toxicity Characteristic Leaching Procedure (TCLP), total waste analyses) that will be used to document achievement of required reductions
- Criteria for disposal of treated materials
  - delisting of residual ash
  - demonstrating that treated wastes do not exhibit Resource Conservation and Recovery Act (RCRA) characteristics
  - meeting notification and certification requirements

- shipping to an off-site RCRA Treatment, Storage, and Disposal (TSD) facility

- A description of the level of closure or capping that is required (RCRA Subtitle C or D)

Information that is already clearly presented in the ROD or FS, and that is appropriately referenced, need not have lists provided concerning target cleanup goals and objectives.

Availability of Data

1. Physical and Chemical Data Collected to Date

Identify all available data and documents that may be pertinent to design activities, providing information on the date of collection and the physical location of each round of data. Include all of the following:

- "Available for review" analytical data collected to date

- Survey notes (including the location of monuments and benchmarks) and engineering or physical data (soil strength and compressibility)

- Soil boring logs

- Treatability studies

Note, for design purposes, any known data gaps or areas of significant data variability and the relative accuracy of the data. You may find it useful to request the RI/FS contractor to identify data items and possible data gaps for the design. Such data could be included in either the FS or a post-ROD design planning submittal.

A listing of physical and chemical data collections will aid in developing the design SOW. It will also enable you and the designer to determine the availability of required data. Emphasize two facts: that this data listing does not necessarily constitute a complete catalog of all data that will be needed, and that it remains the responsibility of the designer to identify all data needs for the appropriate design of the remedy.

2. Data Retrieval

Make provisions for clear labeling and proper storage of all site data. This will make it possible for the data to be readily identified and retrieved by the designer if the remedial design will not begin immediately after the ROD is signed.

Technology and Design Approach

1. Waste Characterization

Review the site data on wastes and develop a general description of the wastes to be treated. Whenever appropriate, prepare a table or chart to provide information on the type, location, condition, uniformity, volume, and any unusual features (e.g., high toxicity, high oil and grease content) of the waste. If this information is listed in the ROD or FS, it can be referenced and a new list does not need to be created.

2. Treatment Scheme

List any description of the selected treatment process including any pertinent design criteria or parameters from the ROD, if present.

2.1 Schematic Diagram

When you have enough information, give the designer a schematic diagram that indicates the basic features of the selected treatment process. The RI/FS and treatability studies may provide additional schematics as well. Be careful to avoid giving the designer schematics that have more detail about the treatment process than is provided in the ROD or that would lock the designer into an illconceived equipment configuration.

2.2 Pretreatment Requirements

If pretreatment requirements are specified in the ROD, describe (to the extent possible) the type, purpose, and level of treatment to be achieved. Reference the ARARs or other mechanisms from which the performance criteria have been derived.

2.3 Treatment Design Criteria

List or describe any treatment performance criteria identified in the ROD. These may include the following:

- Input and output rates

- Maximum and minimum flow rates
- Extraction rates
- Influent or effluent quality
- Sampling frequency and test methods

For the RD to proceed smoothly, these criteria must be established before the design is begun.

Describe any unusual operating or site conditions that could affect the specified technology. For instance, you may know from the RI/FS that an existing landfill, which is slated to be capped, has unusually steep slopes. Providing this information to the designer will allow her or him to anticipate the need for a special cover design to provide long-term stability on the slopes. Likewise, the designer should be made aware of any unusual bedrock formations before designing a diversion trench because this information could affect construction phasing, cost, and design.

3. Long-Term Monitoring and Maintenance Requirements

Review the remedy specified in the ROD and predict the kinds of long-term activities that will have to be performed. Long-term activities involve monitoring and maintaining cleanup equipment that might be used for extended periods. Examples include maintenance of ground-water extraction and treatment equipment, periodic maintenance of mechanical and electrical parts, and continual exchange of carbon filters for air stripping or chemicals for a metal precipitation process. For each type of long-term activity, include information on the frequency of sampling and inspections, the parameters of the analysis to be performed, and the timeframe for these activities.

Longer term (30-year) programs may be required to meet certain RCRA postclosure requirements for capped areas containing hazardous wastes. Activities for these programs could consist of regular inspection for erosion and subsidence, periodic maintenance of the leachate collection and treatment system, the vegetative cover, and the ground-water monitoring system.

Estimate the basic requirements for monitoring: include regulatory requirements, performance requirements, and reevaluation periods. Explain that the designer is responsible for verifying the completeness of this estimate and for determining the frequency and type of sampling or monitoring needed to meet the performance requirements.

Provide information on who (State or Potentially Responsible Parties) will be responsible for the monitoring and maintenance of the site. Explain that the responsible party may have input on design considerations that need to be established at the beginning of the design, such as the complexity of monitoring systems and the automation of systems.

Explain that when the design calls for engineering solutions that leave contaminants on-site, a compliance monitoring program should also be developed or required from the contractor. This program should be designed to provide sufficient information to allow you to determine whether the protectiveness of the remedy has been maintained. These plans will aid in the performance of the 5-year review of the remedy (see Office of Solid Waste and Emergency Response (OSWER) Directive 9355.7-02, dated May 23, 1991).

4. Sole Source or First-Time Use of a Technology or Innovative Technology

Point out any potential requirements for specialized or patented equipment that is likely to be required to meet the goals of the ROD. Also, describe specialized equipment that has been used in predesign activities (bench-scale treatability pilot studies) that also will be required for the RA. This information can prevent delays in completing and implementing the RA by alerting the designer to the need to make provisions for early procurement or installation of the equipment. The procurement of equipment may require a significant lead time, and RA time may increase significantly if the RA contractor has to make major adjustments to calibrate the equipment before treatment.

If noncompetitive (sole-source) procurement is anticipated for a Fund-lead project, include or reference information that the designer can use to justify the procurement. Providing justification for a noncompetitive procurement will place additional requirements on the procuring agent.

5. Treatability Study

Tell the designer if it will be necessary to perform a treatability study (bench or pilot scale) during the design. The primary purpose of the treatability study should be to obtain scale-up information, and

not to determine whether a treatment technology will be effective. Do not automatically require treatability studies if a detailed database already exists for the contaminants of concern. Treatability studies may not be required when adequate treatability data are available from the RI/FS, or when information already exists about the performance of the treatment process because it has been used elsewhere on wastes like those found at the site. Consult with the technical review team, technical advisors employed by the RI/FS contractor, equipment vendors, and the Office of Research and Development's (ORD's) Superfund Technical Assistance Response Team (START) to confirm the appropriate design approach. Also, give the designer some flexibility in determining the necessity of these studies or tests.

When treatability studies are required, they should follow accepted protocols. When using certain remedies, such as innovative technologies for difficult-to-treat wastes, the use of scaled-up versions during design should be considered. This method allows better assessment of, for example, separation techniques or volatilization rates, or estimated changes in heat transfer rates.

6. Special Design Conditions

Describe any special conditions required of the technologies being used and, if known, state why these conditions were established. Special conditions may be associated with an ARAR or an agreement with State or local officials. For example, normally, it may be acceptable to operate an incinerator as long as stack emissions fall within a certain range for the various particulates or gases involved. However, for a given site, the federally established range of emissions may not be acceptable to State or local officials; as a result, higher efficiencies may be required. Other conditions could include specific requirements for a trial burn or off-site disposal, or restrictions on the operating hours because of the noise levels produced by treatment equipment operated adjacent to a residential neighborhood.

7. Flexibility in Design

When the ROD allows flexibility in design, do not attempt to restrict the designer to the use of a specific technology or material. Instead, point out the flexibility allowed, and encourage a review of available alternatives and consultation with appropriate technical advisors, as previously indicated for pilot studies.

Explain that the designer should include a comparison of life-cycle costs (capital, operating, replacement) in the evaluation of treatment processes. This comparison of life-cycle costs should not be confused with the value engineering study that must also be conducted.

8. Schedule Constraints That Could Affect the Rate of Treatment or Unit Size

Point out any target date that must be met (because of court mandate, permit requirements), since this date could affect the rate at which treatment must be performed. Knowledge of this date will enable the designer to make better decisions concerning treatment unit sizes or numbers and the scheduling of construction activities.

9. Confirmation Monitoring (Achievement of Performance Standards)

Confirmation monitoring is the sampling and analysis program that is performed during and after the removal of wastes or contaminated soils, or ground-water remediation, and prior to project closeout. Its purpose is to determine whether the final cleanup levels have been met for the hazardous constituents of concern. The monitoring is done by acquiring sufficient environmental media sampling data to confirm that no residual contamination in excess of the approved levels remains as a threat to human health and the environment and that the remedy is, therefore, complete.

Explain that a confirmation monitoring activity may be a necessary element of the project design requirements, if not already specified in the ROD. Under these circumstances, the designer would need to supply information on specific aspects of monitoring, such as the number of samples and the degree of statistical accuracy that would be required.

Guidance on confirmation monitoring can be found in *Methods for Evaluating the Attainment of Cleanup Standards: Volume 1—Soils and Solid Media* (February 1989, EPA 230/02-89-042) and *Volume 2—Ground Water (July 1992)*.

Similarly, the designer must call for or develop requirements for a shakedown or testing program to demonstrate that equipment installed by the RA contractor performed as the designer intended.

Materials

1. Volume Estimation and Basis of Calculations

Describe the degree of accuracy of existing RI/FS data for the following items:

- Volume estimates
- Delineations of contaminated areas
- Chemical and physical descriptions of all contaminated materials to be stored, treated, or disposed of
- Estimates of off-site disposal needs (drums, ash, sludge)

You and the technical review team should review these items closely, as the accuracy of these values is vital to the validity of cost estimates and to the proper design and implementation of the RA. For example, an on-site RCRA disposal unit built to handle an original volume that was inaccurately estimated may not have the capacity to contain the actual increased volume. Knowledge of relevant volume uncertainties will enable the designer to gather more data or to incorporate conservative design estimates for processes such as on-site excavation, treatment, and disposal.

2. Spatial Requirements, Staging, Logistics

You and the technical review team should evaluate and advise the designer of the possible need for large areas to stage materials and to construct or operate the project. For example, incineration, solidification or stabilization, and other soil or sludge treatment remedies often require space for the following activities:

- Dewatering
- Source separation
- Dredging
- Ash, sludge, and materials treatment and storage
- Tank containment
- Stockpiling
- Staging of equipment or materials
- Decontamination
- Treating
- Locating access roads, trailers, and buildings

Explain that the designer must consider carefully aad determine whether project components should be located on-site or off-site and whether in a contaminated or uncontaminated zone. For certain projects, the acquisition of easements or the outright purchase of properties may be an efficient means for implementing the remedy (using an underground discharge line to connect with a sewage treatment plant intercepting sewer for purposes of groundwater treatment). In addition, depending on remedy uncertainties, you and the technical review team may want to provide a flexible design. This design would allow for expansion by including provisions for additional unit processes, pumps, and various other items or materials needed to accommodate increased flow capacities or additional treatment processes that might arise during remedial action.

3. Durability of Materials

Explain that testing the durability of materials with regard to physical and chemical characteristics may be warranted for certain design components. For example, process system integrity can be affected by wet and dry or freeze and thaw cycling, inadequate design-life assumptions, or corrosion from contact with chemically contaminated media.

If the total volume of materials processed or the length of operation for a treatment facility is tentative, conservative estimates may be warranted, and more durable materials may be appropriate (e.g., using stainless steel instead of carbon steel piping).

4. Materials and Equipment Availability

Alert the designer to review the project and advise you whenever the selected remedy requires locating a source for large quantities of a particular material. Certain materials or equipment needed during the remedial action may require long-lead procurement,

significant distances or size limitations for transportation, or extensive off-site involvement. As an example of off-site involvement, you may need to alert the designer to give early attention to determining the availability of off-site borrow sources or treatment or disposal facilities if the remedy calls for any of the following:

- Placement of an extensive clay cap
- Use of a POTW
- Placement of riprap on embankments, requiring large quantities of 6-inch stone
- Disposal of on-site treatment plant sludge or spent carbon

5. Mixed Materials

List any ROD requirements for the handling of contaminated materials, particularly if the requirements relate to heterogeneous materials. For example, for certain remedies such as soil washing, it is often necessary to separate out large particles (so that the fine ones can be treated). For such remedies, the level of separation and treatment required for the materials should be described to the extent known. Also include a description of the waste to be handled when it contains materials such as the following:

- Organic matter (roots, bushes, trees)
- Large cobbles or boulders
- Debris (tires, batteries, autos, machinery, drums, tanks)
- Difficult-to-treat materials (creosoted piles, oily sediments)

State, if known, whether any permit waivers or treatability variances, such as soil and debris variances under the RCRA land disposal restrictions, should be pursued.

ARARs/Permits/State Involvement

1. ARARs List

OSWER Directive 9355.7-03, *Permits and Permit "Equivalency" Processes for CERCLA On-Site Response Actions* (February 19, 1992), states that

> Remedial actions must comply with those requirements that are determined to be ARARs at the time of ROD signature. [The proposed and final 1982 National Oil and Hazardous Substances Pollution Contingency Plan (NCP)] [S]ection 300.430(f)(1)(ii)(B), in effect, "freezes" ARARs when the ROD is signed unless compliance with newly promulgated or modified requirements is necessary to ensure the protectiveness of the remedy. If ARARs were not frozen at this point, promulgation of a new or modified requirement could result in a reconsideration of the remedy and a restart of the lengthy design process, even if protectiveness was not compromised. This lack of certainty would adversely affect the operation of the [Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA)] program, would be inconsistent with Congress' mandate to expeditiously clean up sites, and could adversely affect negotiations with potentially responsible parties.

List or reference the ARARs that were in effect on the date that the ROD was signed and therefore are required as part of the remedy. This list will be useful in preparing the design SOW, and in establishing an initial agreement between EPA and the designer as to which ARARs must be met in the design.

Explain that the designer must ensure the accounting of all appropriate ARARs, off-site permits, and TBCs (nonpromulgated or enforceable Federal or State "To Be Considered" criteria, advisories, guidance, or proposed standards) that need to be followed or attained during the RD/RA. An example of a TBC is a requirement that all electrical codes be met when constructing a pump station or force main. Duplicative ARARs should not appear on this list, for they should already have been screened out during ROD development. Categorize the ARARs as either chemical-specific, location-specific, or action-specific. Also, identify TBCs that should be addressed during the RA.

Identify for the designer (to the extent possible) any ARARs, variances, waivers, and exemptions that have been used or are available for use. This might include a land ban treatability variance or a waiver of certain Maximum Concentration Levels (MCLs) for remediating contaminated ground water in fractured bedrock.

Explain that the designer is responsible for any potential ARARs that can be established only during design—for example, through treatability studies to be conducted or through specific processes selected during design to satisfy the general remedy selected.

2. On-Site Versus Off-Site Waste Management

The Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) and the National Contingency Plan (NCP) provide that "on-site"* actions will be exempt from having to obtain Federal, State, and local permits through administrative procedures. Although on-site actions must comply with (or waive) the substantive requirements of the permits, these RAs will generally proceed more quickly than off-site actions. In contrast, off-site actions must usually meet the substantive and often lengthy administrative permit components of these ARARs, and comply with the requirements of the Off-Site Policy (in accordance with CERCLA §121(d)(3).

3. Permits and Land-Use Restrictions

Provide a preliminary list of off-site permits to be obtained. Point out situations where institutional controls such as restrictive easements or water-use restrictions are needed, and note all parties who have specific responsibilities for implementing controls: EPA, the State, the local government and/or the designer or constructor. For example, the designer may be required to develop a restrictive easement prohibiting the use of certain wells as a potable water supply.

4. Extent of State Involvement

Describe the anticipated responsibilities of the State during the RD. Include the role of the State in

- help in applying State-developed RD/RA ARARs
- helping to resolve and expedite permitting issues
- gaining access to properties

Unresolved Issues

Provide a list of all known, unresolved issues; include enough detail to enable the designer to understand the concerns of everyone involved. For example, a local sanitation board could be reluctant to accept wastewater from the site for treatment at their POTW. The board's concerns might include the impact of the wastewater on the treatment process or the ability of the plant to accommodate additional volumes of water during peak flow periods. When you resolve issues of this type with help from the designer early in the process, substantial cost savings may result.

Health and Safety Concerns

Alert the designer to potential health and safety concerns (air releases, traffic) that may be posed by the site and the planned remedial activities at the site both for on-site workers and for the neighboring community.

List or reference all known threats posed by the site and the planned remedial activities. Reference and require modification and reuse of any existing data or Health and Safety Plan (HASP) from previous work at the site. This list will facilitate the preparation of a site-specific HASP for any on-site activities to be performed by the designer or by the RA contractor, as defined and required by 29 CFR 1910.120 and 40 CFR 300.150.

The designer should be required to delineate the nonhazardous portions of the post-RD work, because the efficiency of work in hazardous areas is limited in direct proportion to the level of protective clothing required.

Advise the designer of the following contingencies:

- Potential for off-site migration of toxic vapors or particulates that might result from remedial activities
- Associated controls, such as dust suppression, that may be required to minimize health risks to off-site receptors

* "On-site," according to the NCP, may include the areal extent of contamination (as well as reasonably close noncontiguous facilities having wastes compatible with a selected treatment or disposal approach) and all suitable areas, in close proximity to the contamination, involved in implementation of the response action.

- Applicable community air emission standards (an example of an ARAR)
- Site-specific risks from chemical, biological, or physical hazards (such as unusual employee exposure)
- Potential for fire or explosion

Air dispersion modeling might be recommended for predicting potential off-site concentrations. Ambient monitoring requirements as well as realtime air monitoring with action levels may also be required at the site perimeter to determine the need for implementing control measures.

Miscellaneous Concerns

1. Community Involvement Activities

Summarize the community involvement activities that have taken place. Highlight any special interests or concerns that the community has expressed. Include a preliminary list of additional community involvement activities that should be performed as part of the design and construction efforts.

List or reference representatives of citizen groups that have expressed interest in the site.

2. Confidential Business Information

Identify any documents being used for the site RD that also contain confidential business information. Reference each document and its location in the files. Responsibilities for safeguarding confidential business information are explained in EPA's guidance document entitled *Contractor Requirements for the Control and Security of RCRA Confidential Business Information*, dated March 1984, available from OSWER's Confidential Business Information Office.

3. Other RD/RA Requirements

Explain that designer- or RA contractor-developed documents should be provided for each RA and should be called for in the project specifications. These might include a Health and Safety Plan, an Emergency Response Plan, a Community Involvement Plan, a Field Sampling and Analysis Plan, a Quality Assurance Project Plan, or an Operation and Maintenance Plan. These plans may have been developed for an earlier design or for the RI/FS and can be provided to the designer for modification rather than having the designer start from scratch.

CHAPTER 4

DEVELOPING THE PRELIMINARY REMEDIAL DESIGN SCHEDULE

CHAPTER OVERVIEW

Successful management of a remedial design (RD) depends on maintaining schedules and budgets and resolving problems quickly. Techniques for establishing good RD management include requirements for monthly Remedial Project Manager (RPM) and revision of the RD schedule. The designer may not change the RD schedule without your prior written approval. This chapter will help you develop a preliminary schedule to be used during negotiations. Because you may not have all the skills, experience, or insight to develop the schedule, you should rely on the technical review team to help you. To develop the schedule, first produce a comprehensive list of activities or subtasks that, when completed, will achieve the goals specified in the Record of Decision (ROD). In contrast to the preliminary schedule that you prepare, the final, established RD schedule is prepared by the designer. The final schedule must specify reasonable goals, contain sufficient detail to allow monitoring of progress on key activities, and follow the approved Work Plan.

THE PRELIMINARY RD SCHEDULE

Schedule Components

You are responsible for negotiating the preliminary RD schedule with the State, other Government agencies, or a remedial contractor (for Fund-lead projects) or with the Potentially Responsible Party (PRP) (for Enforcement-lead projects). As a starting point for negotiation, develop a preliminary, independent RD schedule—consistent with the draft design Statement of Work (SOW) (see Chapter 6 and Appendix A)—using the 11 standard RD tasks as the basis for establishing schedule milestones. Request that the contracting party (the State, other Government agency, remedial contractor, or PRP) develop a schedule in a similar manner by separating the work into tasks. This parallel organization will provide a common basis for evaluating differences between the two schedules.

Initially, the durations for the individual tasks can be approximated by referring to the generic RD schedules in Appendix B and selecting or adapting values from the tables. (It is anticipated that CERCLIS 3 will be used to record historic data, including the durations of standard tasks for work assignments, from which new data schedules can be developed.)

Generic RD Schedules and Assumptions

The generic RD schedules found in Appendix B were developed to match the 11 standard tasks found in ARCS (Alternative Remedial Contracting Strategy) contracts for RD work assignments. This generic schedule can also be used with slight modification to establish schedule durations for the similar standard tasks for RD found in the RACs (Response Action Contracts) SOW and summarized in Exhibit 4-1.

The assumptions used in developing the generic RD schedules typically apply to all the schedules regardless of the technology applied to remedy the site. If the design activities differ from these assumptions, adjust the schedule accordingly. These assumptions are listed below.

- The Feasibility Study data are sufficient to specify the bench and pilot testing for any treatability study.
- Design reviews are conducted in parallel with the continuing design process rather than in series.
- The duration of individual activities for each of the remedy-specific schedules was selected based on a review of ongoing RD projects and on discussions with consultant and regulatory personnel knowledgeable about the various cleanup technologies, the design requirements, and procurement and planning needs.

Exhibit 4-1
RACs (Response Action Contracts) Standard Tasks for Remedial Action

TASK 1: PROJECT PLANNING AND SUPPORT

- Attend scoping meeting
- Conduct site visit
- Develop work plan and associated cost estimate
  - prepare construction cost estimate
  - initiate discussion regarding 6% design limitation
- Negotiate work plan and make necessary revisions
- Provide conflict-of-interest disclosure
- Evaluate existing data and documents
- Prepare the following (or reference existing) plans:
  - Site Management Plan
  - Field Sampling Plan
  - Quality Assurance Project Plan
  - Health and Safety Plan
- Develop an EPA-approved laboratory quality assurance program
- Develop/review qualifications of the laboratory
- Accommodate external audits or review mechanisms
- Perform site-specific project management
- Manage, track, and report status of site-specific equipment
- Prepare meeting minutes

TASK 2: COMMUNITY INVOLVEMENT

- Update Community Involvement Plan
- Prepare fact sheets
- Prepare or update site mailing list
- Provide public meeting and/or open house support
- Implement other community involvement activities
- Prepare presentation materials

TASK 3: DATA ACQUISITION

- Environmental survey
- Mobilization/demobilization
- Test boring and monitoring well installation and development
- Soil boring, drilling, and testing
- Environmental sampling/monitoring, including the following:
  - ground water
  - surface soil
  - soil boring/permeability
  - air
- Physical/chemical testing
- Field-generated waste characterization and disposal in accordance with local, State, and Federal regulations

(continued on next page)

Exhibit 4-1 (continued)

TASK 4: SAMPLE ANALYSIS

- Perform environmental sample analysis
- Perform waste sample analysis
- Produce analytical data
- Task implementation mechanisms include:
  - field screening
  - Contract Laboratory Program
  - subpool or Team subcontracts laboratories
  - Regional Environmental Services Division
  - Environmental Response Team laboratory
  - regionally procured laboratories

TASK 5: ANALYTICAL SUPPORT AND DATA VALIDATION

- Collect, prepare, and ship environmental samples in accordance with the Field Sampling Plan; the following may be required:
  - field screening
  - ground-water sampling
  - surface/subsurface soil sampling
  - surface water and sediment sampling
  - air monitoring and sampling
  - biota sampling
- Develop Data Quality Objectives
- Request, obtain, and perform oversight of analytical services
- Coordinate with the EPA Sample Management Office, the Regional Sample Control Coordinator, and/or the Environmental Services Division
- Implement the EPA-approved laboratory quality assurance program
- Provide sample management
- Perform data validation
- Review data for useability for its intended purpose
- Provide reports on data validation and useability

TASK 6: DATA EVALUATION

- Data useability evaluation/field quality assurance/quality control
- Data reduction and tabulation
- Comparison of data acquired during design with historic data
- Data trend evaluation and/or modeling and submission of Technical Memorandum

TASK 7: TREATABILITY STUDY/PILOT TESTING

- Provide test facility and equipment
- Test and operate equipment
- Retrieve sample for testing
- Prepare Technical Memorandum
- Characterization and disposal of residuals in accordance with local, State, and Federal regulations

(continued on next page)

Exhibit 4-1 (continued)

TASK 8: PRELIMINARY DESIGN

- Prepare preliminary design, including the following specific components:
  - recommended project delivery strategy and scheduling
  - preliminary construction schedule, including project phasing
  - specifications outline
  - preliminary drawings
  - basis of design report
  - preliminary cost estimate
  - a detailed statement of how all applicable or relevant and appropriate requirements as well as Federal and State public health and safety environmental requirements and standards will be met
  - land acquisition/easement requirements
  - technical support to EPA/State/USACE in land acquisition
  - conduct and/or assist in value engineering screening

TASK 9: EQUIPMENT/SERVICES/UTILITIES

- Procure long-lead equipment, services, and/or utilities

TASK 10: INTERMEDIATE DESIGN

- Prepare intermediate design, including the following specific components:
  - update construction schedule
  - preliminary specifications
  - intermediate drawings
  - basis of design report
  - revised cost estimate
  - a revised detailed statement of how all applicable or relevant and appropriate requirements as well as Federal and State public health and safety environmental requirements and standards will be met, if required
  - an intermediate design review/briefing for EPA
  - Initiate VE study if VE screening identified potential project savings

TASK 11: PREFINAL/FINAL DESIGN

- Prepare the prefinal design, including the following specific components:
  - subcontract award document
  - prefinal design specifications
  - prefinal drawings
  - basis of design report/design analysis
  - revised cost estimate
  - a prefinal/final design review/briefing for EPA
  - biddability (offerability) and constructability reviews
  - revised project delivery strategy
  - the 100% design submittal shall include the final plans and specifications in reproducible format, a final cost estimate, and a schedule of the overall remedial action
  - report results of VE study and incorporate accepted VE recommendations into final design

(continued on next page)

Exhibit 4-1 (continued)

TASK 12: POST-REMEDIAL DESIGN SUPPORT

- Solicit the procurement
- Evaluate offers received
- Inform EPA Contracting Officer of the best qualified/cost-effective offer
- Perform prebid (presolicitation) activities, including:
  - duplication and distribution of contract documents
  - advertising/soliciting of bids
  - issuing addenda
  - prebid (presolicitation) meetings
  - resolution of bidder (offeror) inquiries
  - on-site visits
  - compilation of contract documents
  - resolicit bids/offers and repackage documents if necessary
- Perform preaward activities, including:
  - receipt of bids (offers)
  - determination of responsive, responsible bidders (offerors)
  - bid (offer) tabulation
  - bid (offer) analysis
  - receipt of followup items from lowest responsible bidder (offeror)
  - review of EEO, MBE requirements, SDB subcontracting plans, etc.
  - reference checks
  - request for consent from EPA
- Write site-specific plans before beginning Remedial Action field activities, including:
  - Site Management Plan
  - Sampling and Analysis Plan
  - Health and Safety Plan
  - Community Involvement Plan

TASK 13: WORK ASSIGNMENT CLOSE OUT

- Return documents to EPA or other document repositories
- Duplicate, distribute, and store files
- Archive files to meet Federal Records Center requirements
- Use microfiche, microfilm, or other EPA-approved data storage technology
- Prepare a Work Assignment Close Out Report

- The intermediate design submittal and formal value engineering (VE) are not required for the Simple designs.

- The pilot-scale equipment is available; i.e., long-lead procurement or fabrication is not required.

- Laboratory analysis is conducted similar to EPA's data quality objectives (DQO) Level III; i.e., full Contract Laboratory Program (CLP) validation is not required.

- Resource requirements do not restrain the duration of an activity.

Schedule Development

EPA has developed nine remediation categories (see Exhibit 4-2, Total Design Durations for Nine Remediation Categories/Schedules) that encompass the universe of technologies being used to remediate National Priorities List sites. These nine remedy-specific, generic schedules are included as Charts B.1 through B.9 in Appendix B. We recommend the "bar chart" format to depict the generic RD schedules because it provides a clear display of each task, including the start and completion dates and the relationship to other tasks. Other formats are also acceptable; their usage will depend on the complexity of the project. The generic RD schedules can be used to develop an initial site-specific schedule; however, when you use the schedules, consider (1) the assumptions used in preparing the schedules, and (2) the recommendations provided in this chapter.

You and the technical review team will have knowledge of site data that will enable you to select the remedy-specific, generic RD schedule appropriate for the site. Wherever two or more remedy categories are applicable to the same site (e.g., ground-water treatment and on-site thermal destruction) and the design activities for both remedy categories are to be conducted in parallel, a base generic schedule is to be selected.

The schedule for the remedy of longest overall duration should be selected as the base schedule, with the schedule for the other remedy incorporated into it. The longest duration for each common task should be used in the base schedule and the total duration revised accordingly.

Such use of the generic RD schedules will result in an approximate, first-cut schedule. This schedule can then be used directly for simple projects, or as the basis for refinement into more detailed, site-specific schedules for projects that are complex or that vary from the assumptions for the generic schedules. The site-specific schedule may differ from the first-cut schedule by taking into account features such as the deletion of certain standard design activities that may have been previously performed or the consideration of unique technical design requirements for the site that will cause revision of the time estimates for some of the standard tasks.

You may also use "Timeline" software, along with a computer module that was developed by EPA based on the same principal remediation categories and schedules included as Charts B.1 through B.9 in Appendix B. Additional information on this EPA-developed system can be obtained from Regional Local Area Network (LAN) Administrators.

Exhibit 4-2
Total Design Durations for Nine Remediation Categories/Schedules

	Remedy/Schedule	Total Duration* (months)
1.	Ground-Water Treatment—Complex	13–16
2.	Ground-Water Treatment—Simple	10–13
3.	Ground-Water Treatment—Simple (Expedited)	4–7
4.	Treatment of Soils and/or Sludge—Complex	13–19
5.	Treatment of Soils and/or Sludge—Simple	9–13
6.	Civil Engineering—Complex	13–15
7.	Civil Engineering—Simple	9–13
8.	Civil Engineering—Simple (Expedited)	4–7
9.	On-Site Thermal Destruction	12–15

*Estimated durations are based on completed remedial management (REM) contract design projects. Shorter durations could be achieved through the use of performance specifications or "off-the-shelf "designs.

REMEDY-SPECIFIC SCHEDULES AND ASSUMPTIONS

Nine characteristic RD categories typify the universe of remedial actions being considered or implemented at Superfund sites. A general definition of the nature of each of the nine principal categories, along with the assumptions that were made in developing the generic schedule for each category, is described below. (See Exhibit 4-2 above for these nine principal remediation categories and their range of durations from RD start to 100-percent design approval.) These schedules have been developed using reasonable approximations for performing the standard tasks; however, each Superfund site must be individually analyzed to determine whether the approximate durations apply.

It should be noted, as previously discussed, that a site-specific design may have a combination of these remedies as the overall project solution. It is assumed, in that case, that the component remedies are applied in parallel and that the more complex, time-consuming remedy will determine the overall project duration.

Ground-Water Treatment—Complex
(Appendix B, Chart B.1)

This design category is for withdrawal of ground water, treatment and discharge or disposal of ground water, and surface water or leachate treatment. The technology categories include physicochemical or biological treatment of liquids. Specific technologies may include air stripping, carbon adsorption, metals precipitation, ion change, multimedia filtration, aerobic and anaerobic biodegradation, evaporation, and distillation. However, the aquifer, contaminants, duration of operation and maintenance (O&M), disposal requirements, performance monitoring difficulties, and pumping and treatment system design effort is a more complex, time-consuming effort than in the Simple case. Innovative water treatment technologies may be considered.

Scheduling assumptions

- The complexity of the aquifer system requires extensive aquifer testing.
- The contaminants present and the processes selected require pilot-scale testing in addition to bench-scale testing.
- The complexity of the design effort dictates an intermediate design submittal.

Ground-Water Treatment—Simple
(Appendix B, Chart B.2)

In the Simple case, the technologies are proven for the contaminants of concern and are available in "off-the-shelf" package treatment units. In addition, the aquifer characteristics are not complex, and standard pumping systems are used.

Scheduling assumptions

- Bench-scale testing without pilot-scale treatability testing is sufficient for design.
- The following are not required:
  - Extensive aquifer testing and collection of chemical analytical data
  - Intermediate design submittal.

Ground-Water Treatment—Simple (Expedited)
(Appendix B, Chart B.3)

EPA has developed expedited categories for sites where the RD is simple and straightforward and where additional data collection is not required. Sites where the scope is limited to minor removal actions or administrative controls fall into these categories.

Scheduling assumptions

- A single contractor performs the Remedial Investigation/Feasibility Study (RI/FS), the RD, and construction management.
- The following are not required:
  - Additional data collection to support the RD
  - Treatability studies
  - VE
  - Intermediate design submittal.
- Client agrees at predesign meeting to initiate some aspects of design before approval of the Work Plan.

Treatment of Soils and Sludge—Complex
(Appendix B, Chart B.4)

This design category includes the physical, chemical, or biological treatment or volatilization of soils and sludges. All nonthermal destruction of solids is treated under this category. As a result of complex contaminants and site conditions,

innovative processes requiring extensive testing and development are required.

Scheduling assumptions

- The selected process requires extensive bench- and pilot-scale testing.
- The design magnitude and complexity dictate the submittal of an intermediate design package.

Treatment of Soils and Sludge—Simple
(Appendix B, Chart B.5)

In the Simple case, the process chosen is a well-proven technology for the contaminants of concern and for the existing site conditions.

Scheduling assumptions

- Bench- and pilot-scale testing programs are required; however, they are relatively short.
- The simplicity of design activity and magnitude of the design effort allow elimination of the intermediate design submittal.
- Formal VE is not required.

Civil Engineering—Complex
(Appendix B, Chart B.6)

This design process is principally a civil engineering design. The Complex case may require a more extensive data collection or design effort such as a Resource Conservation and Recovery Act (RCRA) cap, extensive or complicated excavation or demolition activities, or the design of other engineered structures.

Scheduling assumptions

- The magnitude of data-gathering activities is greater than in the Simple case, making the durations of sampling and analysis also greater.
- An intermediate design submittal is required.
- VE is required.

Civil Engineering—Simple
(Appendix B, Chart B.7)

As with the Complex case, this design is principally a civil engineering design. This category will contain such remedies as fencing, ground-water monitoring, and minor earthwork, demolition, or removal activities.

Scheduling assumptions

- No treatability studies are required.
- Data-gathering activities include collection of survey, geotechnical, and chemical analytical data.
- The simplicity of the design activity and magnitude of the design effort allow elimination of the intermediate design submittal.

Civil Engineering—Simple (Expedited)
(Appendix B, Chart B.8)

Both of the expedited categories were developed for sites where the RD is simple and straightforward and where additional data collection is not required. Sites where the scope is limited to minor removal actions or administrative controls also fall into these categories.

Scheduling assumptions

- A single contractor performs the RI/FS, the RD, and construction management.
- The following are not required:
  - Additional data collection to support the RD
  - Treatability studies
  - VE
  - Intermediate design submittal.
- Client agrees at predesign meeting to initiate some aspects of design before approval of the Work Plan.

On-Site Thermal Destruction
(Appendix B, Chart B.9)

This design category includes on-site incineration, pyrolysis, or in situ vitrification.

Scheduling assumptions

- Performance specifications are produced in the design of the thermal destruction unit.
- Detailed design of auxiliary systems is required (e.g., water supply, electricity, fuel, material handling).
- Bench-scale treatability and a pilot-scale test burn are required. It is assumed that pilot test burns are conducted at an existing facility.

RECOMMENDATIONS

Consider the following recommendations to further enhance the usefulness of the concept of a generic RD schedule:

- To maximize cost and technical efficiencies and to become aware of and to correct possible deficiencies, initiate the technical reviews (biddability, constructibility, environmental, claims prevention, and operability) as early as possible during intermediate design. For similar reasons, initiate VE screening early in the project schedule and conduct a formal VE review, if appropriate, during intermediate design.
- The use of "standard" specifications (specifications modeled for a particular type of equipment or treatment process and then modified to be site-specific) or the use of completed plans and specifications for a similar remedy as a starting point for design will save time and resources. Standard specifications are currently available from the U.S. Army Corps of Engineers. A list of these standard specifications can be obtained by calling Ms. Tommian McDaniel at (202) 504-4363.
- For sites where RD will be conducted outside the limits of the assumptions presented here, obtain specific information about duration requirements and current practice for procurement, interagency agreements, owner reviews, and other factors that may affect the start or overall duration of an RD.
- For sites where early RA starts are required to protect the health and safety of the public or for other reasons, you can organize the RD/RA schedule to allow for early RD completion and RA implementation on the simplest operable units first. This method allows earlier RA starts with simultaneous design of the more complex operable units.
- The standard tasks for RD services are described in more detail in the model SOW (Appendix A), and use of the standard tasks is intended to provide a consistent method of reporting design work. Use them as much as possible.

CHAPTER 5

DEVELOPING AN ESTIMATE OF REMEDIAL DESIGN COSTS

CHAPTER OVERVIEW

For Fund-lead projects, EPA's Work Assignment Manager (WAM) is required to prepare an Independent Government Cost Estimate (IGCE) before issuing the work assignment to the selected remedial designer. The *Federal Acquisition Regulation* (FAR) at 48 CFR 36.603 requires that an independent estimate of the cost of design services be prepared for each contract or contract modification (work assignment) that is expected to exceed $25,000. As the WAM of the contract action, it is your responsibility as Remedial Project Manager (RPM) to develop the IGCE during preparation of the Statement of Work (SOW) for the remedial design (RD). This estimate should include a projection of the labor hours necessary to accomplish the work as well as subcontractor costs and other direct costs (ODCs), which may include travel and per diem, communications, equipment, sampling and laboratory analysis, printing, and computer time.

This chapter provides information on the preparation of the IGCE to be used in negotiating a reasonable price for the design of a remedial action (RA) project. IGCEs are important when cost reimbursement contracts are the method of contracting because very little risk falls to the contractor, and the Government must be in a position to determine if the proposed costs are fair and reasonable. You should also prepare an estimate to establish the cost when developing either (1) an interagency agreement with another Government agency (the U.S. Army Corps of Engineers), or (2) a cooperative agreement with a State for the performance of a remedial design.

When a Potentially Responsible Party (PRP) is the project lead, you must have a general understanding of the PRP's design costs, although a detailed estimate is not necessary. You will have to prepare a detailed IGCE for RD oversight and community involvement activities.

Guidance on the roles and responsibilities for preparing IGCEs for work assignments was issued as OSWER Directive 9202.1-2, dated July 29, 1993.
A copy of this Guidance is provided in Appendix C along with OERR Directive 9355.5-0l/FS, (September 1989), *ARCS Construction Contract Modification Procedures.*

IGCE COORDINATORS

A number of Regional offices have cost estimators to help RPMs/WAMs to prepare IGCEs. In other Regions, RPMs/WAMs can seek the assistance of the Project Officer. The IGCE Coordinators can provide information on labor rates, per diem, travel, and ODCs. They may also be able to provide computer program spreadsheets for estimating costs.

DEVELOPING THE ESTIMATE

In preparing a cost estimate for an RD project, first divide the work into the 13 standard tasks for RD work assignments issued under Superfund RACs (Response Action Contracts). (See Exhibit 4-1, Chapter 4.) The activities to be performed under each task should then be outlined in as much detail as possible, consistent with the draft RD SOW. (See Chapter 6 and Appendix A.)

While many of the activities are similar for various sites, each site will have characteristics that require an individual evaluation of the resources necessary to complete the RD. To determine the needed resources, each task should be evaluated for the specific site to estimate its complexity and to identify obstacles that might affect its completion. Consider factors such as the amount of detail required in each of the design documents and the level of expertise needed to evaluate the data and develop the documents. By dividing the work into discrete tasks and defining each functional activity and product in as much detail as possible, you can more accurately estimate the labor hours required to accomplish the work at a given site.

Estimation of Design Labor Hours and/or Level of Effort

Data that characterize the range of the labor hours or level of effort (LOE) for the 11 standard tasks for RD, found in ARCS (Alternative Remedial

Contracting Strategy) contracts, for the Complex, Simple, and Simple (Expedited) versions of the nine principal categories of RA are provided in Appendix D, Tables D.1 through D.9. (See Exhibit 5-1, List of LOE Tables for Remediation Categories.) These tables can also be used with slight modification to establish an estimate of the LOE required to perform work for the 13 standard tasks for RD found in the RACs Sow. These LOE estimates **do not include** labor hours required for program management (i.e., cost and schedule control and management reporting). The data are to be used as a rough check on the more detailed site-specific estimate of labor hours that the RPM has prepared for the standard tasks. When a site uses a combination of categories of RA (e.g., On-Site Thermal Destruction and Civil Engineering-Simple), the labor-hour range may not be completely additive for a given task; again, evaluate the functional activities that comprise each of the 11 standard tasks. Then use your best professional judgment, in conjunction with historical data from similar work assignments, to estimate the number of labor hours needed to complete each task.

Cost Estimation

Once you have estimated the labor hours for all required tasks, the final step in developing the IGCE is relatively straightforward. Obtain the total direct labor costs by multiplying the total labor hours by an estimated loaded hourly rate that falls somewhere between the high and low rates listed in the specific contract. The loaded hourly rate includes the costs of fringe benefits and overhead.

The IGCE should also include ODCs and the cost of subcontracts (site surveys, drilling). Other direct costs include such items as travel or equipment and are computed based on past experience or from established cost parameters such as per diem and travel costs. You can also determine these costs by considering the individual activities that comprise each task. Accounting records for similar projects will provide useful data to verify your estimate. Examples of typical ODCs and subcontractor activities for the 11 standard tasks (under ARCS) are included in the LOE charts (D.1–D.9) provided in Appendix D. These charts are based on early Superfund work assignments. Use these examples as a starting point, keeping in mind that they represent an approximation of the LOE requirements for RD.

Appendix D also contains sample forms for use in preparing an IGCE for RD work assignments. The IGCE should include the information outlined on these sample forms even though formats may vary across Regions. Contact your Regional IGCE Coordinator to obtain computer-based spreadsheets for cost estimate compilation.

Design Fee Limitation

For federally funded projects, the total fee for the preparation of designs, plans, drawings, and specifications must not exceed 6 percent of the estimated construction cost. The FAR at 48 CFR 15.903(d)(1)(ii) states that:

> For architect-engineering services for public works or utilities, the contract price for the estimated cost and fee for production and delivery of designs, plans, drawings, and specifications shall not exceed 6 percent of the estimated cost of construction of the public work or utility, excluding fees.

This statutory limitation, however, applies to the estimated cost of design only; other costs such as travel, site surveys, sampling and analysis, and printing are not subject to the 6-percent design cost ceiling. The design cost estimate should, therefore, include a calculation of the 6-percent ceiling to verify that neither your estimated design costs nor the contractor's proposed design costs exceed the statutory limit for the project. A form for this purpose is provided in Appendix D.

REMEDY-SPECIFIC COST ESTIMATES

Assumptions used to analyze the activities for each standard task in the nine remediation categories are presented in the following paragraphs.*

Ground-Water Treatment—Complex
(See Appendix D, Table D.1)

*The Ground-Water Treatment—Complex remediation category is presented in greater detail than the other eight categories to serve as a template or guide for developing the other schedules.

Exhibit 5-1
List of LOE Tables (in Appendix D) for Remediation Categories

Remedy	Table
Ground-water Treatment—Complex	D.1
Ground-water Treatment—Simple	D.2
Ground-water Treatment— Simple (Expedited)	D.3
Treatment of Soils and Sludge—Complex	D.4
Treatment of Soils and Sludge—Simple	D.5
Civil Engineering—Complex	D.6
Civil Engineering—Simple	D.7
Civil Engineering—Simple (Expedited)	D.8
On-Site Thermal Destruction	D.9

1. Assumptions

1.1 Task 1. Project Planning

Three technical experts (civil engineering, hydrogeology, and chemical process engineering) are needed to support the Work Plan preparations. The contracting party will consolidate comments to maximize efficiency of review and comment resolution.

1.2 Task 2. Community Involvement

This task builds on the community involvement activities of the predesign Remedial Investigation/ Feasibility Study (RI/FS) phase. Level of effort is proportional to the schedule. Activities include revision of an existing Community Involvement Plan, one public meeting, and continued community involvement support through the start of construction.

1.3 Task 3. Data Acquisition

Four technical specifications are required: drilling and well installation, laboratory analytical services, surveying, and waste disposal. In the example, a field data collection effort that takes 6 weeks, including a 2-week pumping test, is assumed.

1.4 Task 4. Sample Analysis and Validation

1.5 Task 5. Data Evaluation

Twenty samples are analyzed and validation is conducted by using data quality objectives (DQO) Level III.

1.6 Task 6. Treatability Study and Pilot Tests

For contracting and evaluation, assume that one contract modification is issued and that one person is needed at the site periodically to oversee the pilot test programs.

1.7 Task 7. Preliminary Design

1.8 Task 8. Equipment and Services Procurement

We assume that at least five permits will be required, including the National Pollutant Discharge Elimination System (NPDES), air, wetlands, erosion and sedimentation control, and local municipality. The RA contractor will acquire the building and construction permits.

1.9 Task 9. Intermediate Design

1.10 Task 10. Prefinal and Final Design

1.11 Task 11. Post-Remedial Design Support

Essentially there should be no difference in LOE between prescriptive and performance specifications. Most site designs will require the use of both prescriptive specifications for site-specific requirements, such as earthwork, and performance specifications for many of the innovative

technologies that have limited performance histories.

You can reduce the LOE, however, by using "standard" specifications or by giving the designer completed plans and specifications for a similar remedy to use as a starting point for the new design.

The final technical design reviews (constructibility, biddability, operability, environmental, and claims prevention) are included here.

The Operation and Maintenance Manual is, at this stage, a detailed "specification" to guide the contractor. The Manual is completed by the RA contractor during startup operations.

2. Summary

The total estimated LOE for the Ground-Water Treatment—Complex version of the generic RD schedule is 8,750 to 11,149 hours. With a schedule of 13 months (to approval of 100-percent design), this loading is equivalent to 4**a** to 5½ full-time positions.

Ground-Water Treatment—Simple
(See Appendix D, Table D.2)

1. Assumptions

Task 3, data acquisition, is set at 6 weeks with 10 samples collected and analyzed. Also, we assume that a pumping test is not required. The design task's LOE is estimated at one-third that of the Complex design. The submittal of an intermediate design and formal value engineering (VE) are not included in this design. The LOE required to obtain permits and site access is held constant for all cases. Permit requirements are typically tied to specific data acquisition and reporting formats irrespective of the complexity of the design.

1. Summary

The total estimated LOE for the Ground-Water Treatment—Simple version of the generic RD schedule is 3,368 to 4,691 hours. With a schedule of 10 months (to approval of 100-percent design), this loading is equivalent to 2 to 3 full-time positions.

Ground-Water Treatment-Simple (Expedited)
(See Appendix D, Table D.3)

1. Assumptions

The expedited schedule assumes that no additional field data collection is required to complete the design. A portable, "off-the-shelf" treatment system will be selected. The treatment system vendor will supply much of the design analysis.

The product of the design tasks will be a package consisting of 20 specifications (civil, chemical, and mechanical) and 5 drawings (site plan, general arrangement, piping and instrumentation diagram, electrical diagram, and process diagram).

2. Summary

The total estimated LOE for the Ground-Water Treatment—Simple (Expedited) version of the generic RD schedule is 1,641 to 2,225 hours. With a 4-month schedule (to approval of 100-percent design), this loading is equivalent to 2½ to 3½ full-time positions.

Treatment of Soils and Sludge—Complex
(See Appendix D, Table D.4)

1. Assumptions

Field data acquisition requires specifications for five activities: drilling, surveying, analytical laboratory, geotechnical laboratory, and waste disposal service.

The average National Priority List site is 10 acres. Assume the field data collection requires 5 weeks and includes the collection of 300 samples; all but 30 are analyzed using an on-site laboratory. Assume that one technology of a complex nature will be studied under the treatability task.

The design criteria to be considered include civil and process engineering, health and safety, and environmental. The design components are estimated using a large east coast Superfund project as a template. This project design package included 50 specifications and 33 drawings.

2. Summary

The total estimated LOE for the Treatment of Soils and Sludge—Complex version of the generic RD schedule is 10,850 to 13,463 hours. With a 17-month schedule (to approval of 100-percent design), this loading is equivalent to 4 to 5 full-time positions.

Treatment of Soils and Sludge—Simple
(See Appendix D, Table D.5)

1. Assumptions

This category is considered appropriate for a 1-acre site. Fifty samples are taken during the field investigation, of which 10 are sent to an off-site analytical laboratory. Design criteria and design activities are similar to those in the Complex category; however, LOE is considerably reduced. As with the other Simple categories, the intermediate design submittal and VE are not required.

2. Summary

The total estimated LOE for the Treatment of Soils and Sludge—Simple version of the generic RD schedule is 4,406 to 5,860 hours. With a 9-month schedule (to approval of 100-percent design), this loading is equivalent to 3 to 4 full-time positions.

Civil Engineering—Complex
(See Appendix D, Table D,6)

1. Assumptions

The model for this design category was a large east coast Superfund site that included several activities: soil excavation, water treatment, a slurry wall, and building decontamination. The actual LOE for this site was reduced by removing the ground-water treatment aspect from consideration.

The activities of field data collection are assumed to be similar to those required in the Soils and Sludge—Complex category. Similar design criteria are considered. An intermediate design submittal and formal VE are included in this category.

2. Summary

The total estimated LOE for the Civil Engineering—Complex version of the generic RD schedule is 10,720 to 13,605 hours. With a 12-month schedule (to approval of 100-percent design), this loading is equivalent to 5¾ to 7¼ full-time positions.

Civil Engineering—Simple
(See Appendix D, Table D.7)

1. Assumptions

The field data acquisition consists of installing three shallow monitoring wells and excavating several test pits. Ten samples are analyzed at an off-site laboratory. Four design criteria are considered in developing the basis of design: civil, hydrogeologic, environmental, and health and safety.

The design is straightforward, with 20 specifications and 5 drawings required for the procurement package. The design reviews are performed by a single person (rather than a team) and the operability review is not performed.

2. Summary

The total estimated LOE for the Civil Engineering—Simple version of the generic RD schedule is 3,106 to 4,187 hours. With a 9-month schedule (to approval of 100-percent design), this loading is equivalent to 2¼ to 3 full-time positions.

Civil Engineering—Simple (Expedited)
(See Appendix D, Table D.8)

1. Assumptions

In this generic category, there are no activities for field data collection and no laboratory analysis. A Basis of Design Report is issued. The design activities are simple and uncomplicated with minimal institutional concerns.

2. Summary

The total estimated LOE for the Civil Engineering—Simple (Expedited) version of the generic RD schedule is 1,633 to 2,210 hours. With a 4-month schedule (to approval of 100-percent design), this loading is equivalent to 2½ to 3½ full-time positions.

On-Site Thermal Destruction
(See Appendix D, Table D.9)

1. Assumptions

An existing Superfund incineration project with a required quantity of excavation close to 20,000 cubic yards was selected as the template for the generic design.

Some water treatment will be necessary for incineration of sludges (treating effluent of the dewatering effort). Treatability studies are required at the bench scale for the water treatment and at bench and pilot scales for the material to be incinerated. Five specifications are needed to conduct activities for field data collection.

The LOE to support the activities for field data collection is assumed to be similar to that required for the Treatment of Soils and Sludge—Simple category. A 1-acre site with a required depth of excavation of 10 feet satisfies the area and volume assumptions presented here and under the Soils and Sludge—Simple category.

Four design criteria are considered: civil and process (including electromechanical) engineering, environmental, and health and safety.

The design activities are similar to the Complex categories previously described and include formal VE and an intermediate design submittal.

2. Summary

The total estimated LOE for the On-Site Thermal Destruction version of the generic RD schedule is 9,411 to 12,939 hours. With a 12-month schedule (to approval of 100-percent design), this loading is equivalent to between 5½ and 7 full-time positions.

CHAPTER 6

DEVELOPING A STATEMENT OF WORK FOR REMEDIAL DESIGN

INTRODUCTION

The purpose of this chapter is to guide you, the Remedial Project Manager (RPM) in developing a site-specific, project-specific Statement of Work (SOW) for remedial design (RD). The chapter is divided into discussions of the development of either a Fund-lead or Enforcement-lead SOW. A model Fund-lead SOW based on the 13 standard tasks found in RACs (Response Action Contracts) is provided in Appendix A.

FUND-LEAD DESIGN

Roles and Responsibilities

1. Remedial Project Manager's Role

When EPA decides to assign a design project to one of its remedial contractors (i.e., EPA acting as the "contracting party"), you must establish the tone and level of the performance required. Your role is not to be all-knowing, but to marshal the resources needed to perform the task at hand. You will be responsible for establishing and maintaining connection with the technical review team, articulating particular needs, assuring that funding is available, establishing project requirements, making decisions affecting RD, and providing other essential information. Failure to fulfill these responsibilities can have serious consequences, regardless of the talent and abilities of the other team members.

Among your responsibilities as RPM are the following tasks;

- Prepare a complete, detailed SOW for design.
- Communicate project objectives and critical-need dates.
- Identify special expertise needed and form a multidisciplinary technical review team.
- Establish reasonable and attainable design criteria.
- Require the designer to implement programs for quality assurance, quality control, and peer review.
- Provide timely reviews and approvals.
- Allow freedom for innovation in design. (Do not impose undue restraints.)
- Stress completeness, timeliness, and professional presentation of submittals.
- Assure that value engineering (VE), biddability, constructibility, operability, claims prevention, and environmental reviews of the design are conducted.
- Be prepared to coordinate, negotiate, and resolve conflicts in a timely manner.
- Assure that both the cost and the schedule for the RD are reasonable.

Effective communication with the technical review team members and the remedial designer is a key element of a successful RD effort. Clear communication about relevant facts, schedules, requirements, expectations, status of work, and funding is critical in any quality project. Lack of communication about changes and delay in sharing new information both result in wasted time and money.

2. The Designer's Role

The designer's primary role is to conceive, plan, and provide quality design solutions in response to the stated requirements of the contracting party. This effort is documented by plans and specifications and other remedial action (RA) contract documents (submittals) used for solicitation and award of the RA contract. After the designer has completed these documents, the contracting party reviews and approves them.

The designer follows the design development criteria and the Basis of Design approved by the contracting party, who plans and executes the design effort. For example, the designer is

primarily responsible for design-phase activities such as the following.

- Planning and managing the design
- Coordinating and communicating
- Monitoring and controlling design costs and schedules
- Providing professionally qualified staff
- Performing design-related quality control
- Designing in compliance with codes and standards, laws and regulations, and regulatory agency requirements
- Arranging for appropriate design reviews and peer reviews

In addition to the responsibilities stated in the designer's contract, the designer is responsible for protecting the public health, safety, and welfare under State licensing laws and for conforming to the code of ethics of the design profession.

Designers are responsible for providing professional quality work that meets professional standards of care, skill, and diligence. If the designer fails to meet these standards, or fails in any other contractual duty, the party that contracted for the design must review the circumstances involved, including the resulting damages and subsequent recovery activities.

By common law, if it is found that a design defect has been the result of either (1) the designer's lack of the ordinary skill, knowledge, and judgment possessed by members of the profession, or (2) the designer's failure to apply professional knowledge and skill, then the party that contracted for design would be entitled to recover from the designer the amount of damages suffered. The damages suffered will vary with the circumstances of each case. In most instances, the damages are considered to be the cost of the RA that would not have been incurred had the design not been defective because of professional negligence on the designer's part.

Such damages might include the cost of redesign to correct the defect during RA and damages to the RA contractor attributed to the delay. However, proving fault with the designer will likely be far more difficult than using the technical review process to make sure that the work is done correctly in the first place.

Design Reviews

It is your responsibility to assure that the technical review team reviews and comments on the design documents and other contractor submittals. These activities may occur concurrently with or prior to other design activities. In the latter case, design activities do not begin until the review is completed, all comments are resolved, and approval to proceed is granted. Concurrent reviews eliminate the inefficiencies and delays caused by stopping and restarting design at the 30- and 60-percent stages; however, in a concurrent review, there is a risk of proceeding with the design of a feature that could require change as a result of the technical review. Other methods for speeding the remedial design process are discussed in the document entitled *Guidance on Expediting Remedial Design and Remedial Action.*

You will coordinate the review process, including collecting the review comments and providing the designer with a concise comments package. This will allow you to screen and respond to comments that need not be passed on to the designer. The designer has a professional responsibility regarding the consequence of the comments on the design and must communicate any adverse effects to you.

The review of the plans and specifications and other required design submittals by the technical review team generally is for administrative purposes only. That is, the review should ensure that the project will achieve its remediation goals and that its performance and operations requirements have been correctly identified. The structural, mechanical, and electrical aspects of the design documents should be reviewed in detail by a qualified member of the technical review team. However, EPA's acceptance of the plans and specifications does not relieve the designer of professional liability for the adequacy of the design.

The duration of review activities for any particular project is a function of the complexity of both the site characteristics and the design, as well as of the administrative requirements of the party who contracts for design, and the design reviewers. The specific review and approval activities, which are the responsibility of both you and the technical review team, should be clearly and separately identified on the project schedule. This level of

precision will reinforce the responsibilities of all parties and will provide early knowledge of any consequences of allowing these activities to move onto the critical path of the design process.

Value Engineering During Design

It is your responsibility to ensure that VE screening and a VE study, if appropriate, are conducted on each Fund-lead RD. We recommend that for most designs, either the U.S. Army Corps of Engineers (USACE), the Bureau of Reclamation (USBR), or an independent firm with the requisite experience be tasked to perform the work. The designer can be tasked to conduct the VE study if the screening performed during preliminary design indicates the need for the study and if an independent and objective study can be conducted by the design firm. (*See Value Engineering Fact Sheet,* Publication 9335.5-03FS, May 1990.) The items to be reviewed in screening a design are identified and discussed in the *RD/RA Handbook,* Publication 9355.5-22 (8/93 Draft).

Developing a Fund-Lead SOW for RD

1. Background

The Fund-lead SOW describes the project-specific professional services to be accomplished by the designer. The SOW should be clear, concise, and enforceable. Services are grouped by tasks that are defined and correlated with services required, level of effort by the designer, project time, and compensation.

The designer is expected to produce certain documents during the development of the project. Among these are the RD Work Plan, cost estimates and schedule, preliminary design and outline specifications, and final design. Each of these documents is the result of one or more subtasks defined in the SOW, and each is scheduled for delivery to EPA on a mutually agreed-upon schedule.

You and the designer share the responsibility and the obligations for on-time performance of assigned tasks and subtasks, which may include providing existing information on the project, arranging for additional specialized information necessary for design, coordinating activities with other project team members, arranging for permits and approvals from other agencies, making prompt decisions, and other activities influencing the designer's ability to perform under the terms of the agreement. EPA's commitment to quality requires that these responsibilities be discussed and written into the SOW.

2. RACs Standard Tasks

Included in each of the RACs is an SOW that contains a full description of typical contractor services. General categories of remedial response activities are further subdivided into standard tasks. (See Exhibit 6-1, RACs Standard Tasks, on page 6-4.) You should use the standard tasks for a given activity to develop a detailed SOW to obtain contractor assistance for a work assignment.

2.1 Benefits of Using Standard Tasks

We strongly recommend that you use the standard tasks (and the model RD SOW found in Appendix A) when you prepare a remedial design SOW for a RACs work assignment. The standard tasks for RD provide uniformity in the remedial process and will ultimately benefit Superfund management functions and objectives. Some of the benefits derived from using standard tasks are listed on page 6-5 in Exhibit 6-2.

Exhibit 6-1
RACs Standard Tasks

Remedial Investigation/Feasibility Study (RI/FS)

Task 1 Project Planning and Support
Task 2 Community Involvement
Task 3 Field Investigation
Task 4 Sample Analysis
Task 5 Analytical Support and Data Validation
Task 6 Data Evaluation
Task 7 Assessment of Risk
Task 8 Treatability Study/Pilot Testing
Task 9 Remedial Investigational Report
Task 10 Remedial Alternatives Screening
Task 11 Remedial Alternatives Evaluation
Task 12 FS Report and RI/FS Report
Task 13 Post RI/FS Support
Task 14 Negotiation Support
Task 15 Administrative Record
Task 16 Work Assignment Close Out

Remedial Design

Task 1 Project Planning and Support
Task 2 Community Involvement
Task 3 Data Acquisition
Task 4 Sample Analysis
Task 5 Analytical Support and Data Validation
Task 6 Data Evaluation
Task 7 Treatability Study/Pilot Testing
Task 8 Preliminary Design
Task 9 Equipment/Services/Utilities
Task 10 Intermediate Design
Task 11 Prefinal/Final Design
Task 12 Post-Remedial Design Support
Task 13 Work Assignment Close Out

Remedial Action

Task 1 Project Planning and Support
Task 2 Community Involvement
Task 3 Development and Update of Site-Specific PlansData Acquisition
Task 4 Procurement of Subcontract
Task 5 Management Support
Task 6 Detailed Resident Inspection
Task 7 Cleanup Validation
Task 8 Remedial Action Implementation
Task 9 Project Performance
Task 10 Project Completion and Close Out
Task 11 Work Assignment Close Out

Exhibit 6-2
Benefits From Using Standard Tasks

- Establishes a common framework for remedial activities among the Regions, Headquarters, and contractors
- Results in cost savings because contractors can prepare Work Plans more efficiently in response to similarly structured SOWs
- Provides a checklist and Work Breakdown Structure (WBS) for work plan negotiations and tracking activities that are included in the SOW for a work assignment
- Enables the development of cost databases to help estimate the cost of future remedial activities
- Facilitates the development of SOW templates and, therefore, saves time and resources.

2.2 Use of Standard Tasks in SOWs

The detailed SOW that you develop for an RD will give the contractor the information needed to plan, schedule, estimate the cost of, and execute the work. The SOW must provide adequate detail on the project requirements so that you and the contractors can independently develop accurate budgets or cost estimates.

The recommended approach to establishing project requirements in the SOW for a work assignment is to rely on the standard tasks established in the RACs, to further define these specific activities, and to expand on site-specific requirements.

2.3 Standard Task Categories

Exhibit 6-1 shows the standard tasks for three (RI/FS, RD, and RA) of the five Fund-lead work areas found in the Statement of Work in RACs. Remedial Design includes the specific activities that occur between the signing of the Record of Decision (ROD) and the completion of design activities.

2.4 Using a Standard Task To Develop a Detailed Task

The examples shown in Exhibits 6-3 and 6-4 on pages 6-6 to 6-7 illustrate the process of using a standard task to develop the detailed task description for a work assignment. The standard task is provided exactly as it appears in the RACs. This task provides a starting point for developing each detailed task of the SOW. The standard task is expanded, broken down into subtasks, and tailored to the specific conditions of the site. It is important to remember that sufficient detail is required at the subtask level to provide clear instructions to the contractor and to facilitate preparation of the Independent Government Cost Estimate (IGCE).

2.5 Work Breakdown Structure

A work breakdown structure (WBS) is simply a numbering system for tasks and subtasks. Use of a WBS is recommended as the best approach for organizing the SOW. This approach allows you to organize the work assignment in the framework of the standard tasks. From this framework, you can develop the project schedule and the IGCE. A standard WBS has been developed for RD SOWs (based on the RACs standard tasks and the model RD SOW found in Appendix A) and is used in the examples shown in Exhibits 6-3 and 6-4.

Exhibit 6-3
Excerpt From Standard Task 1 From RACs SOW

Explanation
This text is the standard task reproduced verbatim from the RACS contract SOW.

TASK 1 PROJECT PLANNING AND SUPPORT

This task includes work efforts related to project initiation and support. Typical activities the contractor may be tasked to perform include but are not limited to:

- Attend scoping meeting
- Conduct site visit
- Develop work plan and associated cost estimate
  - Prepare construction cost estimate
  - Initiate discussion regarding 6% design limitation
- Negotiate work plan and make necessary revisions as a result of EPA comments and/or negotiated agreements

Exhibit 6-4
"Detailed" Task 1 From Model SOW (Appendix A)

Explanation
Provide a task overview and objective.

The purpose of this task is to determine how the site-specific remediation goals, as specified in the ROD, will be met. The following activities shall be performed as part of the project planning task:

Location of meetings should be specified for budgeting purposes.

1.1.1 Attend scoping meeting. Before developing the Work Plan, the contractor shall attend a scoping meeting to be held at the EPA Regional Office.

A Health and Safety Plan (HASP) is required for the site visits.

1.1.2 Conduct a site visit. The contractor shall conduct a site visit with EPA's RPM/WAM during the project planning phase to assist in developing a conceptual understanding of the RD requirements for the site. Information gathered during the visit shall be used to better scope the project and to help determine the extent of additional data necessary to implement the RD. A Health and Safety Plan (HASP) is required for the site visit. The contractor shall prepare a report that documents all EPA, contractor, and site personnel present at the visit; all decisions made during the visit; any action items assigned, including person responsible and due date; any unusual occurrences during the visit; and any portions of the site that were not accessible to the contractor and the effect of this on the RD. The contractor shall prepare a trip report and submit it to the RPM/WAM within 10 calendar days of the site visit.

(continued on next page)

Exhibit 6-4
"Detailed" Task 1 (Continued)

To control expenses, limit review to pertinent documents specific to the site.	1.1.3	Evaluate existing data and documents, including the Remedial Investigation/Feasibility Study (RI/FS), Applicable or Relevant and Appropriate Requirements (ARARs), the Record of Decision (ROD), and other data and documents as directed by the EPA. This information shall be used to determine if any additional data are needed for RD implementation. The documents available for review are listed in Attachment 3.
Define scope and schedule requirements.	1.1.4	Develop a Work Plan including a schedule and cost estimate for the RD. Provide confirmation that there is no conflict of interest. Attend a meeting to negotiate the Work Plan.
	1.1.5	After approval of the Work Plan, prepare a Site Management Plan (SMP) that will provide EPA with a written understanding of how access, security, contingency procedures, management responsibilities, and waste disposal are to be handled.
Minimize FSP preparation costs by requiring use of the existing FSP.	1.1.6	Prepare a Field Sampling Plan (FSP) that defines the sampling and data collection methods that shall be used for the project. It shall include sampling objectives, sample locations and frequency, sampling equipment and procedures, and sample handling and analysis. The FSP shall be written so that a field sampling team unfamiliar with the site would be able to gather the samples and field information required. The FSP developed for the RI/FS should be used whenever possible in preparing the FSP for the RD.
Identify if audit will be performed and specify contractor response items.	1.1.7	Prepare a Quality Assurance Project Plan (QAPP) in accordance with QAMS-005/80 (December 29, 1980). The QAPP shall describe the project objectives and organization, functional activities, and quality assurance/quality control (QA/QC) protocols that shall be used to achieve the desired Data Quality Objectives (DQOs). The DQOs shall, at a minimum, reflect use of analytical methods (for identifying contamination and addressing contamination) consistent with the levels for remedial action objectives identified in the National Contingency Plan.
EPA does not **approve** contractor's HASP, but reviews it to ensure that it is complete and adequately protective.	1.1.8	Prepare a site-specific Health and Safety Plan (HASP) that specifies employee training, protective equipment, medical surveillance requirements, standard operating procedures, and a contingency plan in accordance with 29 CFR 1910.120 1(1) and (1)(2). Use the HASP developed for the RI/FS, whenever possible, in preparing the HASP for the RD. A task-specific HASP must also be prepared to address health and safety requirements for site visits.
	1.1.9	Perform site-specific management including monitoring of costs, preparation of Monthly Progress Report, and preparation and submittal of invoices.

2.6 Completing the Detailed SOW

Develop the detailed SOW for an RD work assignment task by task from the standard tasks using the same task numbers (i.e., WBS) as are listed for the standard tasks. If a standard task is not needed for a particular work assignment (e.g., if intermediate design is not required for a given RD), the numbering order should be kept intact and the words "omitted" or "not used" inserted after the task number.

Expand each standard task to provide the level of detail shown for our example. A model SOW for RD is provided as Appendix A of this Guidance. The purpose of this model SOW is to give you an effective tool for ensuring development of consistent and appropriate SOWs. Model SOWs are also available from Project Officers in most Regional Offices. There is an IGCE Coordinator in each Regional Office who can confirm that the level of detail used for tasks in the SOW is sufficient to allow preparation of the IGCE. The IGCE Coordinator can also be called on to review the detailed tasks for completeness.

Clear, detailed SOWs using standard tasks result in an understanding of project requirements. Planning the project in advance through a detailed SOW provides benefits such as the occurrence of fewer problems later in the project and the ability to track costs and schedules for use in estimating future work.

ENFORCEMENT-LEAD DESIGN

Background

The purpose of this section on Enforcement-lead design is to give you general guidance for developing a site-specific, project-specific SOW for remedial design. The Guidance will address *only* the preparation of the SOW that is an attachment to a Consent Decree (CD) for RD. The Guidance does not address the preparation of a remedial design SOW for use with either a Unilateral Administrative Order (UAO) or an Administrative Order on Consent (AOC).

The Consent Decree

After the ROD is signed, EPA will attempt to negotiate a CD, an agreement with the Potentially Responsible Parties (PRPs) for them to implement the remedy selected in the ROD. If the negotiations are successful, the site will be a PRP-financed site. This scenario is often referred to as an Enforcement-lead project. If the negotiations are not successful, the site will be a Fund-financed site (i.e., EPA will manage and fund the project).

For Enforcement-lead sites, EPA enters into a CD with the PRPs, at which time the parties become the Settling Defendants. The CD—-the primary enforcement document for EPA—specifies the responsibilities of the Settling Defendants for implementing an RD project. Major components of the CD include the ROD and the SOW. The SOW specifies the tasks, activities, and submittals that must be completed to fully implement the selected remedy for the site.

Roles and Responsibilities

Key individuals who understand their corresponding roles and responsibilities during an RD/RA project are necessary for project success. As the EPA representative, you are primarily responsible for developing the SOW, for defining the necessary tasks and submittals, and for overseeing the Settling Defendants' activities in the implementation of an RD/RA project. To fulfill this role, you must have a clear understanding of EPA's role in an Enforcement-lead RD/RA project. If State personnel or other parties are involved, the responsibilities of each of these parties must also be understood and addressed.

The Settling Defendants, responsible for day-to-day management of the RD/RA project, must have a clear understanding of the technical and administrative requirements for implementing an RD/RA project. Under the terms specified in the CD, the Settling Defendants are required to identify the names and professional qualifications of the key individuals (such as the Supervising Contractor) representing the Settling Defendants, and to provide this information to you for approval. Furthermore, the detailed Work Plans that the Settling Defendants are required to submit at the start of the RD and RA phases of the project must formally document the roles and responsibilities of all key individuals involved.

As you can see, delineating the roles and responsibilities of the key individuals representing EPA and the Settling Defendants is critical to ensuring effective implementation and oversight of

the RD/RA tasks. A more complete discussion of these respective roles follows. Additional guidance on roles and responsibilities in an Enforcement-lead RD/RA project can be found in the *Superfund Guidance on EPA Oversight of Remedial Designs and Remedial Actions Performed by Potentially Responsible Parties* (April 1990).

1. RPM's Role: Oversight

As RPM, you have the overall responsibility for ensuring that the Settling Defendants satisfy the requirements of the CD and the SOW. To accomplish this, you are responsible for drafting the final SOW and reviewing and approving submittals specified in the SOW. EPA's approval of a submittal or activity is intended to ensure that the RD/RA tasks are implemented in a manner that is consistent with the selected remedy in the ROD.

In developing an SOW, you will identify these items:

- The RD tasks that are relevant to the specific project (not all projects will require every task that is listed in the model SOW)
- The major submittals (plans, drawings, reports) associated with each of these tasks
- A delivery schedule for all required submittals prepared and executed by the Settling Defendants

It is critical that you develop a clear and comprehensive SOW that is specific to the site and to the remedy selected in the ROD. This enables you (1) to effectively monitor and oversee the Settling Defendants' activities in implementing the RD project, and (2) to enforce the requirements of the CD and the SOW.

As mentioned previously, a clear and concise SOW should alleviate many potential problems that could otherwise result from misunderstandings either in terminology or in schedule dates for submittals. However, even the best-written SOW might not address everything that can arise. Once the SOW is final, it is critical that you meet with the Settling Defendants to discuss both the SOW and details of the RD task requirements. This meeting will ensure that all parties clearly understand their respective roles and responsibilities and will allow questions to be answered immediately. Finally, the meeting also provides an opportunity for you and the Settling Defendants' Project Coordinator to meet and establish rapport.

You will be assisted in the oversight role by an Oversight Official. The Oversight Official is generally tasked by EPA to give you technical support in reviewing submittals and monitoring on-site activities. We recommend using other Federal agencies (e.g., USACE) to help with oversight. See Chapter 7 for more detail on oversight of RD performance by the Settling Defendants.

You may rely on other EPA or State agency staff for technical and administrative support, if needed. These individuals are not considered key personnel but may play a role in the RD project.

You will determine the precise responsibilities of key project individuals based on the scope of the RD project. A summary of the roles and responsibilities and reporting relationships of key individuals are provided in Exhibits 6-5 and 6-6, respectively.

2. Settling Defendants' Role: Implementation

Although EPA reviews and approves submittals throughout the RD/RA project, the ultimate responsibility for implementation of the selected remedy lies with the Settling Defendants. EPA review and approval of your Work Plan or design is merely a statement on acceptability with regard to RA goals in accordance with the ROD and the CD; it in no way guarantees the success of the design in meeting the specified performance standards. The Settling Defendants' Project Coordinator is the focal point for project management and communication with EPA. The Project Coordinator handles various responsibilities: planning, budgeting, selecting contractors, managing contracts, monitoring the progress of project activities, and supporting EPA in community involvement activities.

The Project Coordinator is assisted by a Supervising Contractor who is responsible for the technical requirements of the RD project. All other contractors and subcontractors report to the Supervising Contractor, including the RD professional (lead contractor for implementing the RD).

The QA Official, designated by the Project Coordinator, ensures that QA procedures and requirements are established and met. In this role, the QA Official routinely interacts with the supervising contractor. Quality Assurance comprises plans and actions, identified by the Project Coordinator, to ensure that the remedy meets the project requirements.

Developing an Enforcement-Lead SOW for RD

The Enforcement-lead SOW is a written document that you develop to define the scope of the RD project activities that will be undertaken by the Settling Defendants to meet the requirements of the CD. Ultimately, the SOW will specify the scope of each task and any associated activities required to implement the remedy selected in the ROD.

The SOW should identify the extent of the Settling Defendants' obligations for each task and activity. The Settling Defendants will use the SOW to prepare the RD Work Plan and other specified submittals necessary to implement the selected remedy. Also, because these submittals are critical to your evaluation of the performance of the Settling Defendants in meeting their obligations under the CD and SOW, the SOW must specify the outcome of each task and all required submittals.

The "performance standards" section includes cleanup standards, standards of control, quality criteria, and other substantive requirements, criteria, or limitations, including all ARARs set forth in the ROD. To help ensure enforceability, this section must be well written, clear, and concise. This section should list all ARARs from the ROD, provide all cleanup goal criteria or standards from tables or charts in the ROD, and provide a complete description of all RA objectives and remediation goals provided in the ROD.

You should clearly identify performance requirements to be met by the Settling Defendants, as well as EPA's role in the attainment of the performance standards (e.g., EPA shall confirm that the Settling Defendants met the cleanup standard numbers by . . .). The performance standards in the ROD, SOW, and CD must be consistent.

If the ROD is well written and comprehensive, much of the information on performance standards can be lifted directly from the document with minimal change. If any ARARs or performance standards in the ROD require clarification, the SOW should resolve any discrepancies or ambiguities in an enforceable way. However, in all cases, the performance standards listed in the SOW must be consistent with the ROD (unless EPA is contemplating a ROD amendment or Explanation of Significant Differences (ESD), in which case the standards should be consistent with the revised ROD).

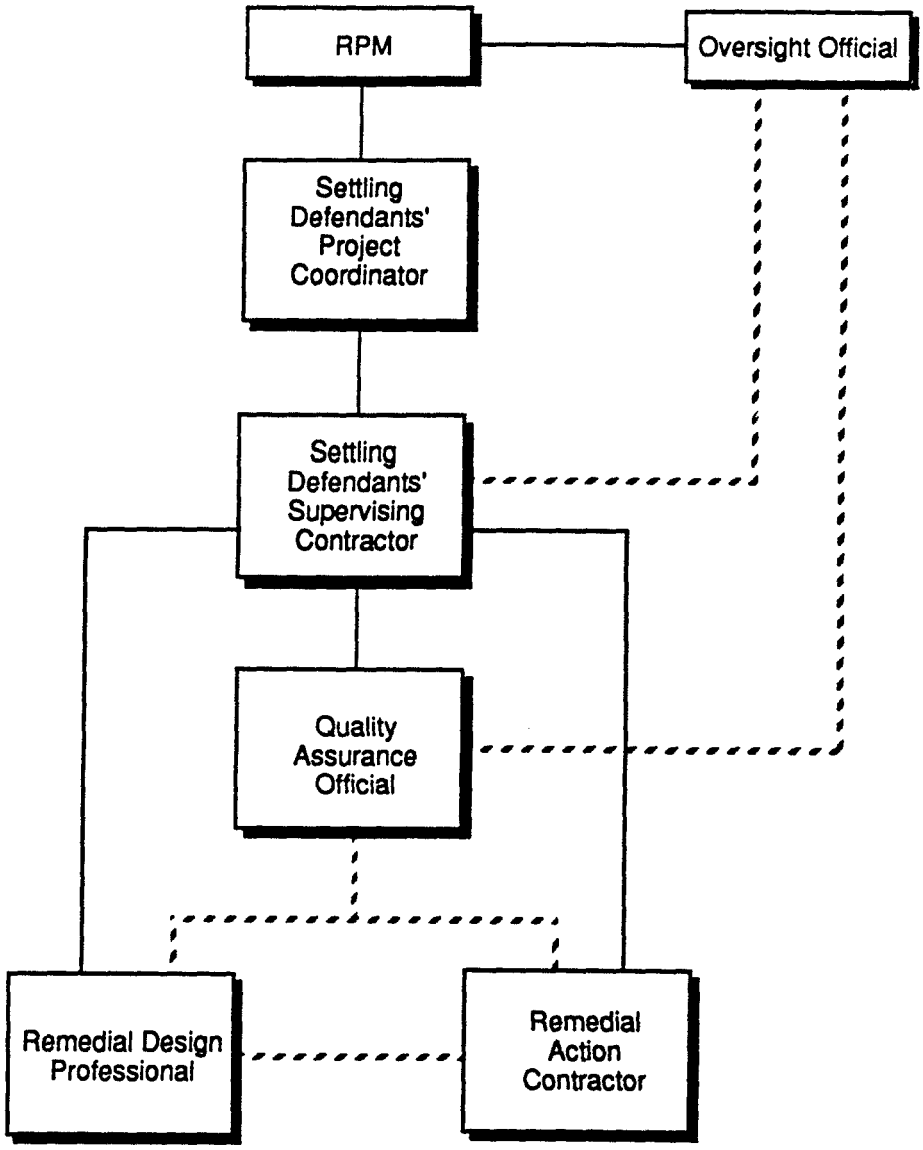
A poorly written SOW can cause serious communication problems between EPA and the Settling Defendants. Ambiguity can result in misunderstandings and the execution of activities that do not conform to the CD and SOW. These misunderstandings can also produce incomplete submittals, schedule delays, and disputes—possibly requiring resolution in court.

Enforcement-lead model SOWs have been developed by each Regional Office; we recommend that you use the one preferred by your management. Compare the technical content of the preferred Regional SOW with the model SOW for Fund-lead RD (in Appendix A) as a check for completeness. Besides using Regional model SOWs, canvass the Region (and possibly other Regions) for recent SOWs written for similar remedies.

Exhibit 6-5
Superfund RD/RA Project Roles and Responsibilities
(Enforcement-Lead)

Title	Designated by	Role	Major Responsibilities	
EPA Project Coordinator/Remedial Project Manager (RPM)	EPA	Oversee and monitor compliance	• Documents and maintains administrative record • Coordinates EPA review of designs and plans prepared by Settling Defendants • Implements Community Relations Plan	Management
Settling Defendants' Project Coordinator	Settling Defendants	Manage project	• Coordinates implementation of remedial design/remedial action (RD/RA) tasks • Manages budget, schedule, and contracts • Supports EPA's Community Relations activities • Prepares and reviews RD/RA plans • Communicates with EPA on progress of RD/RA implementation	
Settling Defendants' Alternate Project Coordinator	Settling Defendants	Assist Settling Defendants Project Coordinator	• As assigned by Settling Defendants' Project Coordinator	
Supervising Contractor	Settling Defendants	Principal Contractor to supervise and direct RD/RA	• Supervises implementation of all RD/RA tasks • Defines subtasks of RD/RA necessary to implement the RD/RA • Functions as the lead contractor at the site • Scopes out other contractors needed • Directs remedial design professional • Directs remedial action contractor • Supervises the implementation of all RD/RA plans	
Remedial Design Professional (Designer)	Settling Defendants	Implement remedial design tasks	• Conducts Value Engineering analysis • Prepares design plans and specifications • Implements field sampling and treatability studies (as needed)	Technical Support
Remedial Action Contractor	Settling Defendants	Implement remedial action tasks	• Directs and oversees construction activities • Maintains records • Conducts inspections and testing	
Quality Assurance Official	Settling Defendants	Implement Construction Quality Control Program	• Examines and tests materials, procedures, and equipment during construction • Implements Quality Assurance programs	Quality Assurance Support
Oversight Official	EPA	Monitor compliance for RPM	• Evaluates professional qualifications of Settling Defendants' professional staff • Reviews technical report and plans • Monitors activities of the Quality Assurance Official • Reviews and approves Construction Quality Assurance Project Plan	

Exhibit 6-6
Relationships Among Parties During Enforcement-Lead RD/RA



Legend: solid line = formal relationship; broken line = informal communication.

CHAPTER 7

DEVELOPING A STATEMENT OF WORK FOR REMEDIAL DESIGN OVERSIGHT

CHAPTER OVERVIEW

Remedial design (RD) oversight involves monitoring remedial design activities to ensure that the Settling Defendants comply with the Consent Decree (CD), Statement of Work (SOW), and applicable regulations (e.g., performance standards, permit limitations, and regulatory requirements). The overall objective of oversight is to focus your efforts as Remedial Project Manager (RPM) on environmental protection, consideration of public health concerns, overall project quality, scheduling, major changes based on changed field conditions, emergency actions, the preparation of design documents, and project closeout. While you have oversight responsibility, and ideally use the technical review team, you may choose to task another Federal agency or a remedial contractor to carry out certain oversight activities to lessen the workload and to gain the needed technical expertise of the contractor. When developing a site-specific SOW for RD oversight by a remedial contractor or other Federal agency, it is your responsibility to establish the appropriate level of oversight for the project.

ROLES AND RESPONSIBILITIES

Remedial Project Manager's Role

It is your responsibility to oversee the Settling Defendants' activities and to monitor compliance with all RD requirements included by incorporation or reference within the CD.

Depending on the complexity of the RD activities, the level of involvement in oversight varies in terms of what you deem necessary to perform adequate oversight. However, in most instances, you will ensure that EPA and its representatives review RD submittals (e.g., Work Plan, Health and Safety Plan (HASP), Quality Assurance Project Plan (QAPP), preliminary design package).

You should use a high level of oversight at the beginning of the RD, determined by requirements specified in the CD, the complexity of the RD, past performance of the Settling Defendants, the qualifications of the Settling Defendant's design team, and any other relevant factors affecting the RD and the implementation of the remedial action (RA). The level of this oversight may then be adjusted accordingly as implementation proceeds, based on the performance of the Remedial Designer.

You may choose to obtain the services of an Oversight Official to assist in carrying out some of the oversight activities. The Oversight Official functions under some form of contractual (in the case where work is assigned to a remedial contractor) or interagency agreement with EPA and reports directly to you.

During RD, you should initiate the following oversight activities to be carried out with the help of an Oversight Official:

- Conduct periodic progress meetings with the Settling Defendants to address the status of project design activities, schedule changes, test results, observations and findings, issues of noncompliance, and upcoming activities. The frequency of the meetings depends on the environmental significance of site activities and the level of oversight desired. (Generally, the frequency will be spelled out in the CD.)

- Verify that data collection activities are not endangering public health and that the Contingency Plan is implemented in the event of an accident or emergency.

- Monitor the RD Quality Assurance (QA) program, including review of the sampling results and testing and inspection reports (prepared by the QA official).

- Coordinate interaction among all Government entities involved, including State and local municipalities.

- Enhance community involvement by providing RD status reports to representatives of the public or to other agencies.

- Document all contacts with the Settling Defendants concerning implementation of the RD.

- Verify that RD tasks are completed.

- Verify that the Settling Defendants are in compliance. If it is determined that the Settling Defendants fail to comply, approach the problem in a constructive manner:

  - Identify the problem and devise corrective actions that are consistent with the CD

  - Document all contacts with the Settling Defendants concerning the inadequacies of the implementation

  - Discuss the proposed corrective action with Regional management to ensure that there is a consistent Regional approach in overseeing the Settling Defendants' response activities

  - If necessary, contact the office of Regional counsel for advice on how to proceed in the event that enforcement becomes necessary

Oversight Official's Role

The RD Oversight Official assists you in observing performance of the work of the design contractor (designer). The Oversight Official reports to you and supports you in monitoring compliance with the CD and the Record of Decision (ROD).

1. Duties and Responsibilities

The responsibilities of the Oversight Official during remedial design could include the following activities:

- Conferences and Meetings:

  Attend meetings with the designer (e.g., predesign conferences, progress briefings, and other project-related meetings) and document all decisions that are made in meetings and conversations with EPA.

- Observation:

  Make observations of RD data collection activities (e.g., field sampling, treatability study) proceeding in accordance with the RD Work Plan and the QAPP.

  Maintain a diary or log of observations as a result of site visits.

- Modifications:

  Evaluate suggestions from the designer and/or the contracting party for modifications to drawings and specifications, and report recommendations to EPA.

  Report to the RPM any actions that the RD contractor or the Settling Defendants take in interpreting the SOW or ROD documents in a way that may materially affect either the work in progress or the original intent of the plans and specifications.

- Submittals:

  Review RD contractor submittals including preliminary, intermediate, and final design drawings and specifications, and various documents including the RD Work Plan, Community Involvement Plan, Site Safety Plan, Field Sampling and Analysis Plan, and QAPP. The review should include checking the documents for conformance with CD, ROD, standard engineering practices, and applicable EPA policies, guidance, and regulations.

  Review submittals prepared by the Settling Defendants at your request.

- Schedules:

  Review the progress schedule, and schedule of submittals prepared by the designer, and consult with EPA concerning acceptability.

- Liaison:

  Assist in obtaining (from EPA) additional details or information when required for proper execution of the work.

  Consult with EPA in advance of scheduled major tests, site visits, or start of important phases of the work.

- Inspection:

  Accompany visiting inspectors representing the public or other agencies having jurisdiction over the project; record the results of these inspections and report them to EPA.

- Records:

  Maintain orderly files for correspondence, reports of conferences, review of drawing and specifications, clarifications and interpretations of the CD, ROD, progress reports, and other project-related documents.

- Reports:

  Review progress reports of the RD contractor and furnish the RPM with routine reports on the schedule and progress of work.

  Furnish EPA with weekly reports of the progress of the work and the designer's compliance with the work schedule and schedule of submittals.

- Safety Concerns:

  Immediately notify the authorized representative of the RD contractor or Settling Defendants of any observed activities that present imminent and substantial endangerment to the public health or welfare or environment, and follow up with an appraisal of the situation to the RPM.

  Advise EPA as promptly as possible of discharges and releases that can affect natural resources or any endangered or threatened species, or that can result in destruction or adverse modification of the habitat of such species.

  Report to EPA on the designer's and contracting party's compliance with on-site worker health and safety requirements.

  Submit pollution reports to EPA as significant developments occur.

  Report any on-site accident immediately to EPA.

2. Limitations of Authority

The Oversight Official is limited from performing the following activities:

- Shall not authorize any deviation from the project documents.

- Shall not undertake any of the responsibilities of the designer or contracting party.

- Shall not issue directions relative to, or assume control over, any aspect of the means, methods, techniques, sequences, or procedures of design.

- Shall not issue directions regarding, or assume control over, safety precautions and programs in connection with site visits by the designer.

- Shall not accept submittals from anyone other than the contracting party.

- Shall not participate in specialized field or laboratory tests or inspections conducted by others.

DEVELOPING AN SOW FOR RD OVERSIGHT

The SOW included in each of the RACs (Response Action Contracts) contains a work area for RD/RA oversight. From this work area a more detailed Model SOW that clearly denotes the activities to be performed by the contractor has been developed and is included in Appendix E of this guidance. As explained in Chapter 6, you should prepare a detailed site-specific SOW, using the Model RD Oversight SOW, that incorporates a work breakdown structure (or numbering system for tasks and subtasks).

The purpose of the Model SOW is to give you an effective tool for ensuring the development of consistent and appropriate SOWs for RD oversight. The Model SOW and work breakdown structure should be used as the framework for developing a detailed, site-specific SOW that describes the duties and responsibilities of the Oversight Official as listed earlier in this chapter. There is an Independent Government Cost Estimate (IGCE) Coordinator in each Regional office who should be asked to confirm that the level of detail used for tasks in the SOW is sufficient to allow preparation of the IGCE.

APPENDIX A

MODEL STATEMENT OF WORK FOR REMEDIAL DESIGN

(date)

APPENDIX A

3. MODEL STATEMENT OF WORK FOR REMEDIAL DESIGN
_____ SITE, _____ COUNTY, _____ STATE

Points for the Work Assignment Manager or Remedial Project Manager (WAM/RPM) to consider in preparing the Statement of Work (SOW) for Remedial Design (RD):

The purpose of this SOW is twofold:

1. **To tell the contractor what you want done.** Be as specific as possible in describing what you want the contractor to do. In that way, the contractor will understand your requirements, will write a work plan and budget describing how and at what cost he or she plans to meet those requirements, and ultimately will be responsible for performing to those requirements. Whenever you have an absolute requirement (e.g., prepare the Quality assurance Project Plan (QAPP) in accordance with QAMS-005/80 (December 29, 1980)), it is best to state it. Add the attachments to the SOW: (1) Summary of Major Submittals for the Remedial Design at_____ (Site), (2) Work Breakdown Structure, and (3) Transmittal of Documents for Acceptance by EPA.

2. **To give the contractor a work breakdown structure for recording costs.** In this manner, work plan costs and final costs of different remedial design projects can be compared and analyzed.

Use of a Work Breakdown Structure (WBS)

1. A WBS has been developed for this model work assignment in order for EPA to track the initial and final costs of each element used for preparing future cost estimates and to share these data with other Federal agencies. The WBS is, essentially, the outline for this work assignment and is included as Attachment 2 to this SOW.

2. If an element is not to be used, do not change the numbering system; instead, insert "not used" or "N/A" after the element number after deleting the text for that element.

3. For the items used for a given project, additional descriptions (e.g., type of samples and estimated number) should be added in order for the contractor and WAM/RPM to develop estimated costs on a common basis.

3.0 Introduction

.0.1 Site Description

Provide a brief site description and site history.

.0.2 Purpose

The purpose of this Statement of Work (SOW) is to set forth the requirements for the Remedial Design (RD) of the selected remedy as defined in the Record of Decision (ROD) issued on _____ (date). The RD is generally defined as those activities to be undertaken by the contractor to develop the final plans and specifications, general provisions, and special requirements necessary to translate the ROD into the remedy to be constructed under the remedial action (RA) phase. The RA is generally defined as the implementation phase of site remediation or construction of the remedy, including necessary operation and maintenance, performance monitoring, and special requirements. The RA is based on the RD to achieve the remediation goals specified in the ROD. This SOW is designed to provide the framework for conducting the RD activities at_____(site). The goal is to complete and deliver the final plans and specifications within_____ months after approval of the work plan. The estimated completion date for this work assignment is _____ .

.0.3 General Requirements

.0.3.1 The contractor shall conduct the RD in accordance with this SOW and consistent with the ROD issued on _____ (date), the *Remedial Design and Remedial Action Handbook* (*DRAFT*) (U.S. EPA Office of Solid Waste and Emergency Response Directive, August 1993), and all other guidance used by EPA in conducting an RD.

.0.3.2 A summary of the major deliverables and a suggested schedule for submittals are attached (Attachment 1). The contractor shall submit the major deliverables using the form Transmittal of Documents for Acceptance by EPA, Attachment _____ .

The attachments to this model SOW may be copied and completed for a given RD. Attachment 4 is a form for use by the contractor in the transmittal of documents to EPA, for use as an attachment to the completed SOW. Attachment 5 is a transmittal register log for use by the WAM/RPM in tracking documents submitted by the contractor.

.0.3.3 Specifically, the RD involves the design of _____ .

.0.3.4 The contractor shall furnish all necessary and appropriate personnel, materials, and services needed for, or incidental to, performing and completing the RD.

.0.3.5 A list of primary guidance and reference material is attached (Attachment 3). In all cases, the contractor shall use the most recently issued guidance.

.0.3.6 The estimated cost of the RA, as outlined in the ROD, is $ _____ .

.0.3.7 The contractor shall communicate at least weekly with the Work Assignment Manager or Remedial Project Manager (WAM/RPM), either in face-to-face meetings or through conference calls.

.0.3.8 The contractor shall notify the WAM/RPM when 75 percent of the approved work assignment budget has been expended and when 95 percent has been expended.

.0.3.9 The contractor shall document all decisions that are made in meetings and conversations with EPA. The contractor shall forward this documentation to the WAM/RPM within two working days of the meeting or conversation.

It still remains the WAM's responsibility to fully document all decisions made. The contractor's documentation is to be used for confirmation only.

.0.3.10 EPA will provide oversight of contractor activities throughout the RD. EPA review and approval of deliverables is a tool to assist this process and to satisfy, in part, EPA's

3.0.3.10 *(continued)*

responsibility to provide effective protection of public health, welfare, and the environment. EPA will review deliverables to assess the likelihood that the RD will achieve its remediation goals and that its performance and operations requirements have been correctly identified. Acceptance of plans and specifications by EPA does not relieve the contractor of responsibility for the adequacy of the design.

.0.4 Record-Keeping Requirements

The contractor shall maintain all technical and financial records for the RD in accordance with the contract. At the completion of the RD, the contractor shall submit _____ copies of the official record of the RD in _____ (format) to the WAM/RPM.

Points for the WAM/RPM to consider:

1. Technical and financial records must be able to support decisions made during the RD as well as to support cost recovery.

2. Check with the Regional Records Manager and with Regional Counsel regarding the distribution, number of copies, and preferred format (i.e., hard copy, microform, CD-ROM) for the official records of the RD.

.0.5 Equipment Transfer

At the completion of the remedial design work assignment, the contractor shall transfer to the EPA Equipment Coordinator all equipment purchased with contract funds in accordance with the contract.

.0.6 Project Closeout

At the completion of the RD work assignment, the contractor shall perform all necessary project closeout activities as specified in the contract. These activities may include closing out any subcontracts, indexing and consolidating project records and files as required in Paragraph 0.4 above, and providing a technical and financial closeout report to EPA. Final costs shall be reported to EPA (on disk) broken down into the cost for each element of the Work Breakdown Structure (WBS) (Attachment 2) for this work assignment.

3.1 Project Planning and Support

The purpose of this task is to determine how the site-specific remediation goals, as specified in the ROD, will be met. The following activities shall be performed as part of the project planning task:

.1.1 Project Planning

.1.1.1 Attend Scoping Meeting. Before or concurrent with developing the Work Plan, the contractor shall attend a scoping meeting to be held at the EPA Regional Office.

Point for the WAM/RPM to consider:

Location of meetings and the RPM's expectations for the number of contractor personnel to attend should be specified for cost estimation purposes.

.1.1.2 Conduct Site Visit. The contractor shall conduct a site visit with the EPA WAM/RPM during the project planning phase to assist in developing a conceptual understanding of the RD requirements for the site. Information gathered during the visit shall be used to better scope the project and to help determine the extent of additional data necessary to implement the RD. A Health and Safety Plan (HASP) is required for the site visit. The contractor shall prepare a report that documents all EPA, contractor, and site personnel present at the visit; all decisions made during the visit; any action items assigned, including person responsible and due date; any unusual occurrences during the visit; and any portions of the site that were not accessible to the contractor and the effect of this on the RD. This report shall be submitted to the EPA WAM/RPM within 10 calendar days of the site visit.

.1.1.3 Evaluate Existing Information. The contractor shall evaluate existing data and documents, including the Remedial Investigation/Feasibility Study (RI/FS), the ROD, and other data and documents as directed by EPA. This information shall be used to determine if any additional data are needed for RD implementation. The documents available for review are listed in Attachment_____ .

Point for the WAM/RPM to consider:

The RPM will create an attachment to this SOW. Additional documents to list in the attachment could include the summary of the "Information Collection" Effort (see Chapter 3 of the *Guidance for Scoping the Remedial Design*), Focused Feasibility Studies (FFS), State documentation, hydrogeological information, and RPM file data. However, to control expenses, limit review to pertinent documents specific to the site.

.1.1.4 Develop Work Plan. The contractor shall present the general approach that will be used for the RD at a Work Plan scoping meeting with the WAM/RPM. This meeting will be held at the Region _____ office.

Point for the WAM/RPM to consider:

If the RD will be complex, consider modifying subtask 3.1.1.4 (1) to include a scoping meeting. A scoping meeting held before the contractor finalizes the technical approach will ensure that you and the contractor are in agreement as to the approach to be taken and that the agreed-upon approach is reflected in the Work Plan. The contractor may not have to rewrite the Work Plan if this is done.

(1) Develop Draft Work Plan. The contractor shall prepare and submit a draft RD Work Plan within 30 calendar days after initiation of the Work Assignment (WA). Submit the original to the Contracting Officer (CO) and two copies to the Project Officer (PO). The Work Plan shall include a comprehensive description of the additional data collection and evaluation of activities to be performed, if any, and the plans and specifications to be prepared. A comprehensive design management schedule for completion of each major activity and submittal shall also be included. The Work Plan shall be developed in conjunction with the Sampling and Analysis Plan (SAP) and HASP, although each plan shall be delivered under separate cover within 30 calendar days after initiation of the WA.

3.1.1.4 *(continued)*

Points for the WAM/RPM to consider:

1. Make sure that the submittal requirements in this SOW are in accordance with the submittal requirements for the contract.

2. You must prepare an independent Government cost estimate (IGCE) for the RD before you issue the Work Assignment (WA) to the contractor.

(a) Develop Narrative. Specifically, the Work Plan shall present the following:

- A statement of the problem(s) and potential problem(s) posed by the site and how the objectives of the RD will address the problem(s).
- A background summary setting forth: (1) a brief description of the site including the geographic location and a description of the physiographic, hydrologic, geologic, demographic, ecological, cultural, and natural resource features of the site; (2) a brief synopsis of the history of the site including a summary of past disposal practices and a description of previous responses that have been conducted by local, State, Federal, or private parties at the site; (3) a summary of the existing data including physical and chemical characteristics of the contaminants identified and their distribution among the environmental media at the site.
- The contractor's technical and management approach to each task to be performed, including a detailed description of each task; the assumptions used; the identification of any technical uncertainties (with a proposal for the resolution of those uncertainties); the information needed for each task; any information to be produced during and at the conclusion of each task; and a description of the work products that will be submitted to EPA. The contractor shall identify any subcontractors it plans to use to accomplish all or part of a task's objectives. Tasks and subtasks shall be presented in the same WBS format as provided in this work assignment.
- A schedule for specific dates for the start and completion of each required activity and submission of each deliverable required by this SOW. (See Attachment 1 for format.) This schedule shall also include information about timing, initiation, and completion of all critical path milestones for each activity and deliverable and the expected review time for EPA.

Point for the WAM/RPM to consider:

For schedule development, you should indicate to the contractor whether design activity will continue concurrent with EPA design review or whether work is to stop until the contractor receives design review comments. In deciding which to prescribe, weigh the obvious tradeoff of cost of possible rework versus shortened schedule.

3.1.1.4 *(continued)*

(b) Develop Cost Estimate. The contractor's estimated cost to complete the work assignment shall be broken down into the Level of Effort (by P-level) and cost for each element of the Work Breakdown Structure (Attachment 4) and submitted to EPA on disk.
(c) Internal QA and Submission of Draft Work Plan.

(2) Prepare Final Work Plan
(a) Attend Negotiation Meeting. The contractor shall attend a Work Plan negotiation meeting at the Region _____ office.
(b) Modify Draft Work Plan and Cost Estimate. If the contractor finds that the remedial action being designed differs significantly from the ROD or that an ARAR cannot be met, the contractor shall describe the issue and recommend technical solutions in a memo to the WAM/RPM. The contractor shall make revisions to the Work Plan as a result of EPA's comments and/or negotiation agreements.
(c) Internal QA and Submission of Final Work Plan.

.1.2 Preparation of Site-Specific Plans

.1.2.1 Develop Site Management Plan. After EPA approval of the RD Work Plan, the contractor shall prepare a Site Management Plan (SMP) that provides EPA with a written understanding of how access, security, contingency procedures, management responsibilities, and waste disposal are to be handled.
(1) Develop Pollution Control and Mitigation Plan
(2) Develop Transportation and Disposal Plan (Waste Management Plan)

.1.2.2 Develop Health and Safety Plan. Prepare a site-specific HASP that specifies employee training, protective equipment, medical surveillance requirements, standard operating procedures, and a contingency plan in accordance with [40 CFR 300.150 of the NCP and] 29 CFR 1910.120 1(1) and (1)(2). Whenever possible, refer to the HASP developed for the RI/FS when preparing the HASP for the RD. A task-specific HASP must also be prepared to address health and safety requirements for site visits.

.1.2.3 Develop Sampling and Analysis Plan (Chemical Data Acquisition Plan)
(1) Quality Assurance Project Plan. The contractor shall prepare a Quality Assurance Project Plan (QAPP) in accordance with EPA QA/R-5 (latest draft or revision). The QAPP shall describe the project objectives and organization, functional activities, and quality assurance/quality control (QA/QC) protocols that shall be used to achieve the desired Data Quality Objectives (DQOs). The DQOs shall, at a minimum, reflect use of analytical methods for identifying contamination and addressing contamination consistent with the levels for remedial action objectives identified in the National Contingency Plan. The QAPP developed for the RI/FS should be referenced or adapted whenever possible when preparing the QAPP for the RD.
(2) Field Sampling Plan. Prepare a Field Sampling Plan (FSP) that defines the sampling and data collection methods that shall be used for the project. The FSP shall include sampling objectives; sample locations and frequency; sampling equipment and procedures; sample handling and analysis; and a breakdown of samples to be analyzed through the Contract Laboratory Program (CLP) and through other sources, as well as the justification for those decisions. The FSP shall consider the use of all existing data and shall justify the need for additional data whenever existing data will meet the same objective. The FSP shall be written so that a field sampling team unfamiliar with the site would be able to gather the samples and field information required. The FSP developed for the RI/FS must be referenced or adapted whenever possible when the

3.1.2.3 *(continued)*

FSP is prepared for the RD; the contractor shall document any required changes to the FSP in a memorandum to the WAM/RPM.

Points for the WAM/RPM to consider:

1. Depending on the complexity of the sampling effort needed to support the RD, the FSP and QAPP can be combined into a single Sampling and Analysis Plan (SAP).

2. Minimize the duplication of data collection by requiring the contractor to use existing data whenever practicable. Contractors tend to "mistrust" data collected by others, regardless of the quality. Limiting the collection of data can shorten the design period.

3. Reduce time and costs by using an on-site laboratory to analyze routine samples rather than going through the CLP.

4. Identify whether audits will be performed and specify contractor response items.

(3) Data Management Plan
(4) Develop Other Plan(s)

.1.3 Project Management

.1.3.1 Prepare Periodic Status Reports. The contractor shall prepare Monthly Progress Reports.
(1) Document Cost and Performance Status. The contractor shall document the status of each task and report costs and level of effort (by P-level) expended to date.
(2) Prepare and Submit Invoices

.1.3.2 Meeting Participation and Routine Communications. The contractor shall attend project meetings, provide documentation of meeting results, and shall contact the WAM by telephone on a weekly basis to report project status.

.1.3.3 Perform Engineering Network Analysis

.1.3.4 Manage, Track, and Report Equipment Status. The contractor shall manage, track, and report the status of all site-specific equipment.

.1.3.5 Work Assignment Closeout

A point for the WAM/RPM to consider:

You should specify the format for submissions; e.g., Monthly Progress Reports, if there are Region-specific requirements or if you have specific requirements.

.1.4 Subcontract Procurement and Support Activities

.1.4.1 Identification and Procurement of Subcontractors. Procure and administer the necessary subcontracts, including, but not limited to the following:
(1) Drilling Subcontractor
(2) Surveying Subcontractor
(3) Geophysical Subcontractor
(4) Site Preparation Subcontractor

3.1.4.1 *(continued)*

(5) Analytical Services Subcontractor(s)
(6) Waste Disposal Subcontractor
(7) Treatability Subcontractor(s)
(8) Other(s)

.1.4.2 Establish and Carry Out a QA Program for Subcontracts

.1.4.3 Perform Subcontract Management

3.2 Community Involvement

The contractor shall provide community involvement support to EPA throughout the RD. The contractor shall provide community involvement support in accordance with *Community Involvement in Superfund: A Handbook*, June 1988. Community involvement shall include the following subtasks:

Point for the WAM/RPM to consider: Listed below are a number of possible community involvement activities you may require, depending on the specific situation.

.2.1 Develop Community Involvement Plan (CRP)

The contractor shall develop an RI/FS CRP to address community involvement requirements during the RD. This CRP may be modified from an existing CRP to meet site-specific requirements.

.2.1.1 Conduct Community Interviews

.2.1.2 Prepare the CRP
(1) Draft CRP
(2) Final CRP

.2.2 Prepare Fact Sheets

The contractor shall prepare a fact sheet that informs the public about activities related to the final design, a schedule for the RA, activities to be expected during construction, provisions for responding to emergency releases and spills, and any potential inconveniences such as excess traffic and noise that may affect the community during the RA.

.2.3 Public Hearing, Meetings, and Availability Support

The contractor shall support and assist in public hearings, meetings, and open houses. The contractor shall prepare presentation materials and provide support as needed for public meetings.

Points for the WAM/RPM to consider: 1. The number and location of anticipated public meetings should be identified in the SOW. 2. The RPM should specify the number of contractor personnel expected to be in attendance at the public meetings.

.2.3.1 Technical Support. The contractor shall provide technical support for community involvement. This support may include preparing technical input to news releases, briefing materials, and other community involvement vehicles, and helping the WAM/RPM to coordinate with local agencies.

.2.3.2 Logistical and Presentation Support

.2.3.3 Public Notice Support

.2.4 Maintain Information Repository and Mailing Lists

The contractor shall develop or revise site mailing lists and maintain a repository of information on activities related to the site-specific remedial design as described in Appendix A.8, page A-19, of *Community Involvement in Superfund: A Handbook,* June 1988.

Point for the WAM/RPM to consider:

You should specify the format for Community Involvement submissions (e.g., fact sheets, news releases) if there are Region-specific requirements or if you have specific requirements.

3.3 Data Acquisition

Data acquisition entails collecting environmental samples and information required to support the RD. The planning for this task is accomplished in Task 3.1, Project Planning and Support, which results in the plans required to collect the field data. Data acquisition starts with EPA's approval of the FSP and ends with the demobilization of field personnel and equipment from the site.

The contractor shall perform the following field activities or combination of activities for data acquisition in accordance with the EPA-approved FSP and QAPP developed in Task 3.1.

Point for the WAM/RPM to consider:

Before beginning field activities, consider specifying a kickoff meeting with all principal personnel to clarify objectives, communication channels, etc., to ensure the efficient use of available funds.

.3.1 Mobilization and Demobilization

Provide the necessary personnel, equipment, and materials for mobilization and demobilization to and from the site for the purpose of conducting the sampling program under subtask 3.3.2, Field Investigation.

.3.1.1 Identify Field Support Equipment, Supplies, and Facilities

.3.1.2 Mobilization. Mobilize and set up a field laboratory to facilitate rapid turnaround times for analytical results and identification of sample locations for subsequent sampling rounds.

(1) Site Preparation
   (a) Perform Demolition
   (b) Clearing and Grubbing
   (c) Perform Earthwork
      - Provide Borrow Pit
      - Construct Haul Roads
      - Construct Roads, Parking, Curbs, and Walks

3.3.1.2 *(continued)*

- Install Storm Drainage and Subdrainage
- Install Fencing and Site Security

(2) Installation of Utilities
  (a) Install Electrical Distribution
  (b) Install Telephone and Communication System(s)
  (c) Install Water, Sewage, and Gas Distribution
  (d) Install Fuel Line Distribution

(3) Construction of Temporary Facilities
  (b) Construct Decontamination Facilities
  (b) Construct Sample and Derived Waste Storage Facility
  (c) Construct Field Offices
  (d) Construct Mobile Laboratory
  (e) Construct Other Temporary Facilities

.3.1.3 Demobilization. Demobilize the field laboratory.
(1) Removal of Temporary Facilities
(2) Site Restoration

.3.2 Field Investigation. Conduct environmental sampling to include the following:

.3.2.1 Perform Site Reconnaissance. The contractor shall conduct site surveys including property, boundary, utility rights-of-way, and topographic information. These surveys are to refine the survey data from the RI/FS and to ensure the accuracy of the information for the RD.

Point for the WAM/RPM to consider:

For items of this Model Statement of Work that are not needed for a given project, please retain the numbers for the items, but enter "Not Used" or N/A" after the numbers of those items.

For the items used for a given project, additional descriptions (e.g., type of samples and estimated number) should be added in order for the contractor and RPM/WAM to develop estimated costs on a common basis.

(1) Ecological Resources Reconnaissance
  (a) Well Inventory
  (b) Residential Well Sampling
  (c) Land Survey
  (d) Topographic Mapping
  (e) Field Screening

.3.2.2 Conduct Geological Investigations (Soils and Sediments)
(1) Collect Surface Soil Samples
(2) Collect Subsurface Soil Samples
(3) Soil Boring and Permeability Sampling
(4) Collect Sediments Samples
(5) Survey Soil Gases
(6) Test Pit

.3.2.3 Conduct Air Investigations
(1) Sample Collection
(2) Air Monitoring Station

.3.2.4 Conduct Hydrogeological Investigations: Ground Water
- (1) Install Well Systems
  - (a) Accomplish Mobilization
  - (b) Develop Wells
  - (c) Conduct Downhole Geophysics
  - (d) Install Monitoring Wells
  - (e) Install Test Wells
  - (f) Install Gas Wells
- (2) Collect Samples
- (3) Collect Samples During Drilling (e.g., HydroPunch or Equivalent)
- (4) Conduct Tidal Influence Study
- (5) Perform Hydraulic Tests (Pump Tests)
- (6) Measure Ground-Water Elevation

.3.2.5 Conduct Hydrogeological Investigations: Surface Water
- (1) Collect Samples
- (2) Study Tidal Influence
- (3) Measure Surface-Water Elevation

.3.2.6 Conduct Waste Investigation
- (1) Collect Samples (Gas, Liquid, Solid)
- (2) Dispose of Derived Waste (Gas, Liquid, Solid)

.3.2.7 Conduct Geophysical Investigation
- (1) Surface Geophysical Activity [can just list these]
- (2) Magnetometer
- (3) Electromagnetics
- (4) Ground-Penetrating Radar
- (5) Seismic Refraction
- (6) Resistivity
- (7) Site Meteorology
- (8) Cone Penetrometer Survey
- (9) Remote Sensor Survey
- (10) Radiological Investigation

.3.2.8 Conduct Ecological Investigation
- (1) Wetland and Habitat Delineation
- (2) Wildlife Observations
- (3) Community Characterization
- (4) Identification of Endangered Species
- (5) Biota Sampling and Population Studies

.3.2.9 Collect Contaminated Building Samples.

.3.2.10 Dispose of Investigation-Derived Waste. Characterize and dispose of investigation-derived wastes in accordance with local, State, and Federal regulations as specified in the FSP (see the Fact Sheet, *Guide to Management of Investigation-Derived Wastes*, 9345.3-03FS (January 1992)).

3.3.2.10 *(continued)*

Points for the WAM/RPM to consider:

1. The WAM/RPM must determine the types of sampling that will be needed and select from the list above.

2. The numbers of samples anticipated should be specified so that both the contractor and the WAM/RPM can develop the cost estimates.

3. The WAM/RPM should consult with the Technical Review Team to determine the types and numbers of samples to be collected. The numbers may be refined upon negotiation with the contractor.

4. The WAM/RPM should specify the expected written and/or photographic documentation to be recorded in the field.

5. The AM/RPM should specify the type of field activity reports that are expected, the frequency, and required distribution (RPM, State representative, etc.).

3.4 Sample Analysis

The contractor shall arrange for the analysis of environmental samples collected during the previous task. The sample analysis task begins with reserving sample slots in the CLP and the completion of the field sampling program. This task ends with the contractor validating the analytical data received from the laboratory.

Points for the WAM/RPM to consider:

1. Consider adding a subtask for on-site laboratory analysis. The purpose of this new subtask would be to perform screening analyses only.

2. If special analytical services (SAS) are required, they must be specified in a subtask.

The contractor shall perform the following activities or combination of activities to analyze test results:

.4.1 Screening-Type Laboratory Sample Analysis
- .4.1.1 Analyze Air and Gas Samples
  - (1) Organic
  - (2) Inorganic
  - (3) Radiochemistry
- .4.1.2 Analyze Ground-Water Samples
  - (1) Organic
  - (2) Inorganic
  - (3) Radiochemistry
- .4.1.3 Analyze Surface-Water Samples
  - (1) Organic
  - (2) Inorganic
  - (3) Radiochemistry
- .4.1.4 Analyze Soil and Sediment Samples
  - (1) Organic

3.4.1.4 *(continued)*

(2) Inorganic
(3) Radiochemistry

.4.1.5 Analyze Waste (Gas) Samples
(1) Organic
(2) Inorganic
(3) Radiochemistry

.4.1.6 Analyze Waste (Liquid) Samples
(1) Organic
(2) Inorganic
(3) Radiochemistry

.4.1.7 Analyze Waste (Solid) Samples
(1) Organic
(2) Inorganic
(3) Radiochemistry

.4.1.8 Analyze Biota Samples
(1) Organic
(2) Inorganic
(3) Radiochemistry

.4.1.9 Analyze Bioassay Samples

.4.1.10 Perform Bioaccumulation Studies

.4.2 CLP-Type Laboratory Sample Analysis

.4.2.1 Analyze Air and Gas Samples
(1) Organic
(2) Inorganic
(3) Radiochemistry

.4.2.2 Analyze Ground-Water Samples
(1) Organic
(2) Inorganic
(3) Radiochemistry

.4.2.3 Analyze Surface-Water Samples
(1) Organic
(2) Inorganic
(3) Radiochemistry

.4.2.4 Analyze Soil and Sediment Samples
(1) Organic
(2) Inorganic
(3) Radiochemistry

.4.2.5 Analyze Waste (Gas) Samples
(1) Organic
(2) Inorganic
(3) Radiochemistry

.4.2.6 Analyze Waste (Liquid) Samples
(1) Organic
(2) Inorganic
(3) Radiochemistry

.4.2.7 Analyze Waste (Solid) Samples
(1) Organic
(2) Inorganic

3.4.2.7 *(continued)*

(3) Radiochemistry

.4.2.8 Analyze Biota Samples
(1) Organic
(2) Inorganic
(3) Radiochemistry

.4.2.9 Analyze Bioassay Samples

.4.2.10 Perform Bioaccumulation Studies

3.5 Analytical Support and Data Validation

The contractor shall arrange for the validation of environmental samples collected during the previous task. The sample validation task begins with reserving sample slots in the CLP and the completion of the field sampling program. This task ends with the contractor validating the analytical data received from the laboratory.

Perform appropriate data validation to ensure that the data are accurate and defensible.

Points for the WAM/RPM to consider:
1. For RD, full data validation procedures are usually not necessary. You may want to specify the level of data validation required.
2. You should specify the format for submissions if there are Region-specific requirements or if you have specific requirements.

The contractor shall perform the following activities or combination of activities to validate test results:

.5.1 Prepare and Ship Environmental Samples
.5.1.1 Ground-Water Samples
.5.1.2 Surface and Subsurface Soil Samples
.5.1.3 Surface-Water and Sediment Samples
.5.1.4 Air Samples
.5.1.5 Biota Samples
.5.1.6 Other Types of Media Sampling and Screening

.5.2 Coordinate with Appropriate Sample Management Personnel

.5.3 Implement EPA-Approved Laboratory QA Program.

.5.4 Provide Sample Management (Chain of Custody, Sample Retention, and Data Storage)

Ensure the proper management of samples. Ensure accurate chain-of-custody procedures for sample tracking, protective sample packing techniques, and proper sample-preservation techniques.

.5.5 Validate Data
.5.5.1 Review Analysis Results Against Validation Criteria
.5.5.2 Provide Written Documentation of Validation Efforts

3.5.5.2 *(continued)*

Point for the WAM/RPM to consider: Specify the format for submissions if there are Region-specific requirements or if you have specific requirements.

3.6 Data Evaluation

The contractor shall organize and evaluate existing data and data gathered during the previous tasks that will be used later in the RD effort. Data evaluation begins with the receipt of analytical data from the data acquisition task and ends with the submittal of the Data Evaluation Summary. Report Specifically, the contractor shall perform the following activities or combination of activities during the data evaluation effort:

.6.1 Data Usability Evaluation and Field QA/QC

.6.2 Data Reduction, Tabulation, and Evaluation.

Evaluate, interpret, and tabulate data in an appropriate presentation format for final data tables. Design and set up an appropriate database for pertinent information collected that will be used during the RD.

- .6.2.1 Evaluate Geological Data (Soils and Sediments)
- .6.2.2 Evaluate Air Data
- .6.2.3 Evaluate Hydrogeological Data: Ground Water
- .6.2.4 Evaluate Hydrogeological Data: Surface Water
- .6.2.5 Evaluate Waste Data
- .6.2.6 Evaluate Geophysical Data
- .6.2.7 Evaluate Ecological Data

.6.3 Modeling

- .6.3.1 Contaminant Fate and Transport
- .6.3.2 Water Quality
- .6.3.3 Ground Water
- .6.3.4 Air
- .6.3.5 Other Modeling

.6.4 Develop Data Evaluation Report. Evaluate and present results in a Data Evaluation Summary Report and submit to the WAM/RPM for review and approval. After the WAM/RPM's review, attend a meeting with EPA to discuss data evaluation results and next steps.

Points for the WAM/RPM to consider: You should specify the format for submissions if there are Region-specific requirements or if you have specific requirements. Specify that the contractor shall prepare and submit a Technical Memorandum to the WAM/RPM if new analytical data needs or significant data problems are identified during the evaluation.

3.7 Treatability Study and Pilot Testing

The purpose of the treatability study is to provide sizing and operations criteria that are used in design drawings and specifications and in the engineer's cost estimate to optimize the RD. The task begins with the preparation of a Treatability Study Work Plan that provides the technical specifics of the study and ends with the contractor's submittal of the Treatability Study Evaluation Report. In some instances, information on technology performance can be found in the current literature and should be reviewed before the Treatability Study is designed.

The three levels of treatability studies are laboratory screening, bench-scale testing, and pilot-scale testing. The laboratory screening is used to establish the validity of a technology to treat waste and is normally conducted during the FS. Bench-scale testing is used to identify the performance of the technology specific to a type of waste for an operable unit. Often bench-scale tests are conducted during the FS. Pilot-scale testing is used to provide quantitative performance, cost, and design information for remediation and is typically performed during RD (see the Fact Sheet, *Guide for Conducting Treatability Studies Under CERCLA*, November, 1993).

In accordance with the design management schedule established in the approved RD Work Plan, the contractor shall perform the following activities:

.7.1 Literature Search

.7.2 Develop Treatability and Pilot Work Plan

Prepare the Treatability Study Work plan and submit to the WAM/RPM for review and approval. The Treatability Study Work Plan shall describe the technology to be tested, test objectives, test equipment or systems, experimental procedures, treatability conditions to be tested, measurements of performance, analytical methods, data management and analysis, health and safety procedures, and residual waste management. The DQOs for the treatability study shall also be documented.

The Treatability Study Work Plan shall also describe pilot plant installation and startup, pilot plant operation and maintenance procedures, and operating conditions to be tested.

If testing is to be performed off-site, permitting requirements shall be addressed. A schedule for performing the treatability study shall be included with specific dates for each task and subtask, including EPA review periods. Key milestones that should have completion dates specified included, but are not limited to, the procurement of contractors and the completion of sample collection, the performance period, sample analysis, and report preparation.

Point for the WAM/RPM to consider:

In the SOW, be clear about the expected schedule, and specify deadlines for each activity so as to maintain the overall RD schedule. When reviewing the contractor's Work Plan, check to see that the schedule in the Treatability Study Work Plan is consistent with the schedule in the RD Work Plan.

The Treatability Study Work Plan shall describe in detail the treatment process and how the proposed vendor or technology will meet the performance standards for the site. The Treatability Study Work Plan shall address how the contractor will meet all discharge or disposal requirements for any and all treated material, air, water, and expected effluents. Additionally, the Work Plan shall explain the proposed final treatment and disposal of all material generated by the proposed treatment system.

Points for the WAM/RPM to consider:

1. List the treatment train and components of the system, if possible.
2. Where do treated water and residuals go?
3. Will there be discharges to air? Is an air pathway analysis needed to ensure the protection of workers and the public?
4. Does the contractor need to consider Land Disposal Restrictions?
5. Consider having a contingency plan in case problems develop

Conduct the Treatability Studies, as necessary, to determine whether the remediation technology or vendor of the technology can achieve the performance standards. Treatability studies shall be conducted as described in the EPA-approved Final Treatability Study Work Plan.

The following activities may be required during the performance of the treatability study and pilot testing:

.7.3 Bench Test

- .7.3.1 Procure Test Facility and Equipment. The contractor shall procure test facility and equipment, including the procurement procedures necessary to acquire the vendor, equipment, or facility to execute the tests.
- .7.3.2 Provide Vendor and Analytical Service
- .7.3.3 Test and Operate Equipment. The contractor shall test equipment to ensure operation, then start up and operate equipment.
- .7.3.4 Retrieve Sample for Testing. The contractor shall obtain samples for testing as specified in the Treatability Work Plan.
- .7.3.5 Perform Laboratory Analysis. The contractor shall establish a field laboratory to facilitate fast-turnaround analysis of test samples, or, if necessary, shall procure outside laboratory services to analyze the test samples and evaluate test results.
- .7.3.6 Characterize and Dispose of Residuals

.7.4 Pilot-Scale Test

- .7.4.1 Procure Test Facility and Equipment. The contractor shall procure test facility and equipment, including the procurement procedures necessary to acquire the vendor, equipment, or facility to execute the tests.
- .7.4.2 Provide Vendor and Analytical Service
- .7.4.3 Test and Operate Equipment. The contractor shall test equipment to ensure operation, then start up and operate equipment.
- .7.4.4 Retrieve Sample for Testing. The contractor shall obtain samples for testing as specified in the Treatability Work Plan.
- .7.4.5 Perform Laboratory Analysis. The contractor shall establish a field laboratory to facilitate fast-turnaround analysis of test samples, or, if necessary, shall procure outside laboratory services to analyze the test samples and evaluate test results.
- .7.4.6 Characterize and Dispose of Residuals

.7.5 Field Test

.7.5.1 Procure Test Facility and Equipment. The contractor shall procure test facility and equipment, including the procurement procedures necessary to acquire the vendor, equipment, or facility to execute the tests.

.7.5.2 Provide Vendor and Analytical Service

.7.5.3 Test and Operate Equipment. The contractor shall test equipment to ensure operation, then start up and operate equipment.

.7.5.4 Retrieve Sample for Testing. The contractor shall obtain samples for testing as specified in the Treatability Work Plan.

.7.5.5 Perform Laboratory Analysis. The contractor shall establish a field laboratory to facilitate fast-turnaround analysis of test samples, or, if necessary, shall procure outside laboratory services to analyze the test samples and evaluate test results.

.7.5.6 Characterize and Dispose of Residuals

.7.6 Develop Treatability Study Report.

_____ days after completion of the Treatability Study, the contractor shall prepare and submit the Treatability Study Evaluation Report that describes the performance of the technology. The study results shall clearly indicate the performance of the technology or vendor compared with the performance standards established for the site. The report shall also evaluate the treatment technology's effectiveness, implementability, cost, and final results compared with the predicted results. The report shall also evaluate full-scale application of the technology, including a sensitivity analysis identifying the key parameters affecting full-scale operation.

Points for the WAM/RPM to consider:

Specify the format for submissions if there are Region-specific requirements or if you have specific requirements.

Consider holding a project review meeting with your Technical Review Committee and other team members after completing the above task to present the results of the Treatability Study and to summarize the status of the RD.

3.8 Preliminary Design

Preliminary Design begins with the initial design and ends with the completion of approximately 30 percent of the design effort. At this stage, the contractor shall have field-verified the existing conditions of the site, as necessary. The contractor shall provide supporting data and documentation with the design documents defining the functional aspects of the project to prove that the completed project will be effective in meeting the remediation goals and applicable or relevant and appropriate requirements (ARARs). hi accordance with the schedule established in the RD Work Plan, the contractor shall submit to EPA the Preliminary Design, which shall consist of the following subtasks:

Points for the WAM/RPM to consider:

Depending on the complexity of the RA, you may choose to require design submittals at 30 percent and again at 95 to 100 percent, eliminating the intermediate design submittal at 60 percent completion of the design.

.8.1 Preliminary Design

The contractor shall prepare a Design Criteria Report that defines in detail the technical parameters upon which the design will be based. Specifically, the Design Criteria Report shall include the preliminary design assumptions and parameters, including (1) waste characterization; (2) pretreating requirements; (3) volume and types of each medium requiring treatment; (4) treatment schemes (including all media and byproducts), rates, and required qualities of waste streams (i.e., input and output rates, influent and effluent qualities, potential air emissions, and so forth); (5) performance standards; (6) long-term performance monitoring and operations and maintenance (O&M) requirements; (7) compliance with all ARARs, pertinent codes, and standards; (8) technical factors of importance to the design and construction including use of currently accepted environmental control measures, constructability of the design, and use of currently acceptable construction practices and techniques. In addition to a Design Criteria Report, the contractor shall do the following:

Point for the WAM/RPM to consider:

It is recommended that a Design Criteria Report be submitted at approximately 10 percent completion.

.8.1.1 Recommend Project Delivery Strategy and Scheduling. The schedule shall include an evaluation of a phased approach to expedite the RA.

.8.1.2 Prepare Preliminary Construction Schedule. A preliminary RA schedule appropriate to the size and complexity of the project shall be included in the plans and specifications.

.8.1.3 Prepare Specifications Outline. The outline of general specifications shall include all specification sections that will be used. Specifications shall conform to the Construction Specification Institute (CSI) format.

Point for the WAM/RPM to consider:

The need for performance specifications in lieu of a detailed design is determined under this subtask.

.8.1.4 Prepare Preliminary Drawings. The drawings and schematics shall reflect organization and clarity. This submittal should include (1) an outline or listing of proposed drawings and schematics; (2) facility representations including a revised process flow diagram and a preliminary piping and instrumentation diagram; (3) a general arrangement diagram; and (4) site drawings.

Point for the WAM/RPM to consider:

The character of the drawings and schematics will vary according to the remedy. Formatting requirements for the drawings should be specified in this subtask.

.8.1.5 Prepare Basis of Design Report. The contractor shall submit a detailed description of the evaluations conducted to select the design approach as part of the Basis of Design Report. This report shall include a Summary and Detailed Justification of Assumptions. This summary shall include (1) calculations supporting the assumptions; (2) a draft process flow diagram; (3) a detailed evaluation of how all ARARs will be met; (4) a plan for minimizing environmental and public impacts; and (5) a plan for satisfying permitting requirements.

.8.1.6 Prepare Preliminary Cost Estimate. The preliminary RA cost estimate shall be a preliminary evaluation of the costs of all the elements of the RA. The estimate should be accurate within plus _____ percent and minus _____ percent and be prepared by using the M-CACES Gold cost estimating system for remedial action. Results of the value engineering (VE) screening are presented as part of the RA cost estimate. (See subtask 3.8.4.)

Points for the WAM/RPM to consider:

1. In the subtask above, use plus 40 percent and minus 20 percent for simple projects; plus 50 percent and minus 3 0 percent for complex projects.

2. M-CACES Gold Estimating System is the computer software currently used for estimating construction costs by the U.S. Army Corps of Engineers (USACE) for their RA projects and will facilitate their review of the cost estimate. The use of this system is required under the new Response Action Contracts (RACs), and is optional under ARCS contracts.

.8.2 Describe Variances with the ROD

If the contractor finds that the RA being designed differs from the ROD or that an ARAR cannot be met, the contractor shall describe the issue and recommend technical solutions in a memorandum to the WAM/RPM.

.8.3 Land Acquisition and Easement Requirements

The need for land acquisition for access and casement requirements shall be identified and submitted as part of the Basis of Design Report.

.8.3.1 Identify Need and Locations

.8.3.2 Provide Technical Support for Land Acquisition Efforts

.8.4 Conduct and/or Assist in Value Engineering Screening

The VE screening shall include an evaluation of cost and function relationships, concentrating on high-cost areas. The VE screening shall be performed by an independent Value Engineering group

3.8.4 *(continued)*

that is not otherwise participating in the RD. The outcome of the screening shall be a recommendation for or against a full-scale VE study (a subtask performed during intermediate design) based on the potential for cost savings as a result of design changes. [Value Engineering Fact Sheet, May 1990.]

.8.5 Respond to Design Review Comments

The contractor shall consolidate and respond to design review comments. A written response to each comment shall be provided. The response shall indicate whether the contractor has decided to implement a design change as a result of the comment, and how the change will impact the selected remedy, RD/RA costs, and/or schedule. A summary of the responses to comments shall be submitted to the WAM prior to initiation of Intermediate Design. The design changes shall be incorporated under Intermediate Design (Task 3.10).

.8.6 Participate in Preliminary Design Review or Briefing

The contractor shall participate in design review meetings to be held at Region _____ offices.

Point for the WAM/RPM to consider: Specify the format for submissions if there are Region-specific requirements or if you have specific requirements.

The contractor shall implement QC procedures to ensure the quality of all reports and submittals to EPA. These procedures shall include, but are not limited to, internal technical and editorial review; the independent verification of all calculations used in the design; and the documentation of all reviews, the problems identified, and corrective actions taken.

[NOTE: ITEMS 3.8.2 THROUGH 3.8.6, INCLUSIVE, ARE NOT INCLUDED IN THE 6-PERCENT DESIGN LIMITATION CALCULATIONS.]

3.9 Equipment, Services, and Utilities

This task includes all efforts necessary to procure long-lead equipment and/or services.

.9.1 Identify Long-Lead Equipment Services and/or Utilities

The contractor shall prepare a list of any elements or components of the facility that will require custom fabrication or long lead time for procurement. The list shall also state the basis for such need, and list the recognized sources of such procurement.

Points for the WAM/RPM to consider: This task does not include award of a contract, Contract award should normally be conducted as part of a separate RA work assignment.

.9.2 Procure Long-Lead Equipment Services and/or Utilities

3.9.2 *(continued)*

The contractor shall prepare necessary plans and specifications, advertise for, and evaluate bids for equipment and services.

3.10 Intermediate Design

The intermediate design begins at the completion of the preliminary design phase and ends with the completion of approximately 60 percent of the total design effort. The contractor shall submit to EPA the Intermediate Design submittal which shall consist of a continuation and expansion of the Preliminary Design submittal. Review comments on the Preliminary Design shall be reflected in the Intermediate Design. A Value Engineering Study shall be performed based on approved recommendations from the VE screening submitted with the preliminary design. The Intermediate Design documents shall be submitted in accordance with the approved design management schedule and shall consist of the following subtasks:

.10.1 Update Construction Schedule

The schedule for implementation of the RA shall identify the timing for initiation and completion of all critical path tasks. The schedule shall specifically identify duration for completion of the project and major milestones.

.10.2 Prepare Intermediate Specifications

Plans and specifications shall conform to acceptable standards and shall be formatted in accordance with CSI requirements. Plans and specifications shall include preliminary specifications for construction, installation, site preparation, and field work standards, including an equipment startup and operator training plan. A table of contents for the general specifications shall be provided with this submittal. All specifications shall conform to CSI format.

.10.3 Prepare Intermediate Drawings

The contractor shall submit an outline or listing of drawings: facility representations containing a process flow diagram, a piping and instrumentation diagram, and a control logic table; and continuation and expansion of drawings submitted with the Preliminary Plans and Specifications. Include engineering drawings for grading/paving, foundation, and electrical, structural, and mechanical elements, etc.

.10.4 Prepare and Submit Revised Basis of Design Report

The contractor shall submit a revised summary of the evaluations conducted to select the design approach as part of the revised Basis of Design Report. The report shall include the following components:

Summary and Detailed Justification of Assumptions. This summary shall include: (1) design calculations supporting the assumptions; (2) a revised process flow diagram; (3) a detailed evaluation of how ARARs will be met; (4) a plan for minimization of environmental and public impacts; and (5) heat and mass balances.

Recommended RA Contracting Strategy. The contractor shall address the management approach for procuring the RA contractor, including procurement methods, phasing alternatives, and contractor and equipment availability concerns.

Plan for Satisfying Permitting Requirements. EPA comments shall be incorporated into an updated Permits Plan.

Identification of Easement and Access Requirements. The need for land acquisitions for access and easement requirements shall be identified and submitted as part of the Intermediate Design.

Identification of the projected O&M requirements and development of an estimate of annual O&M costs.

.10.5 Prepare Revised RA Cost Estimate

This revised estimate of the RA shall be developed using flow sheets, layouts, and equipment details. The estimate shall be accurate within plus ___ percent and minus percen. and be prepared using the M-CACES Gold Cost Estimating System for Remedial Action.

Points for the WAM/RPM to consider:

1. In the subtask above, use plus 30 percent and minus 15 percent for simple projects; plus 40 percent and minus 20 percent for complex projects.

2. Use of M-CACES Gold Estimating System computer software for the cost estimate is required for EPA RD work assignments under the new RACs and is recommended for ARCS. This system is used by USACE for construction cost estimating and will enable contractor-prepared construction estimates to be more readily reviewed for accuracy.

.10.6 Participate in Intermediate Design Review or Briefing

The contractor shall participate in a variety of design review activities, including design review meetings to be held at Region ___. The contractor shall also perform and submit a report describing the results of the following design reviews:

.10.6.1 Initial Constructability Review. The contractor shall review and provide written comments for the Initial Constructability Review. The constructability review shall be conducted to evaluate the suitability of the proposed project and its components in relation to the project size.

.10.6.2 Initial Biddability Review. The contractor shall review and provide written comments for the initial biddability review.

.10.6.3 Initial Operability Review. The contractor shall review and provide written comments for the Initial Operability Review. The operability review shall assure that the completed project will conform to applicable performance and operations requirements.

.10.6.4 Initial Environmental Review. The contractor shall review and provide written comments for the Initial Environmental Review.

.10.6.5 Initial Claims Prevention Screening. The contractor shall review and provide written comments for the Initial Claims Prevention Screening. The claims prevention review is to

3.10.6.5 *(continued)*

be conducted to eliniinate conflicts, inconsistencies, ambiguities, errors, omissions, or other identifiable problems in the plans, specifications, and contract documents that are subject to change orders and contractor claims.

.10.7 Perform VE Study and Report Recommendations

The VE Study shall be conducted and the Report prepared by an independent Value Engineering group that is not otherwise participating in the RD (as in subtask 3.8.4).

.10.8 Describe Variances with the ROD

If the contractor finds that the remedial action being designed differs from the ROD, or that an ARAR cannot be met, the contractor shall describe the issue and recommend technical solutions in a memorandum to the WAM/RPM.

.10.9 Respond to Design Review Comments

A written response to each comment shall be provided. The response shall indicate whether the contractor has decided to implement a design change as a result of the summary of the responses to comments shall be submitted to the WAM prior to initiation ofIntermediate Design. The design changes shall be incorporated under Intermediate Design (Task 3.10).

[NOTE: ITEMS 3.10.6 THROUGH 3.10.9 ARE NOT INCLUDED IN THE 6-PERCENT DESIGN LIMITATION CALCULATIONS.]

3.11 Prefinal and Final Design

The contractor shall submit the Prefinal Design according to the design management schedule. The Prefinal Design shall function as the draft version of the Final Design. The Prefinal Design shall address comments generated from the Intermediate Design Review and clearly show any modifications of the design as a result of incorporation of the comments. After EPA review and comment on the Prefinal Design, the Final Design shall be submitted. All Final Design documents shall be approved by a Professional Engineer registered in _____ (state where site is located). EPA approval of the Final Design is required before initiating the RA, unless specifically authorized by EPA.

.11.1 Prepare Prefinal Design Specifications

A complete set of construction drawings and specifications (general specifications, drawings, and schematics) shall be submitted at the prefinal stage. All specifications shall conform to CSI format. Value engineering report recommendations (submitted with the intermediate design) that have been approved by EPA shall be incorporated into the prefinal design drawings and specifications. The final design plans and specifications must be consistent with the technical requirements of all ARARs. Any off-site disposal shall be in compliance with the policies stated in the Procedure for Planning and Implementing Off-Site Response Actions (*Federal Register,* Volume 50, Number 214, November 1985 pages 45933–45937) and other applicable guidance.

General correlation between drawings and technical specifications is a basic requirement of any set of working construction plans and specifications. Before submitting the project specifications, the contractor shall coordinate and cross-check the specifications and drawings; and complete the proofing of the edited specifications and the cross-checking of all drawings and specifications.

.11.2 Prepare Prefinal Drawings

The final submittals shall include a complete set of construction drawings and specifications as well as a set of one-half size reductions of drawings. All specifications shall conform to CSI format.

.11.3 Prepare Final Basis of Design Report that incorporate any changes since the intermediate design submittal.

.11.4 Prepare Revised RA Cost Estimate

The contractor shall prepare a definitive cost estimate of the offers to be received for RA for each work item from definitive engineering data, within an accuracy of plus 15 percent to minus 5 percent. The definitive cost estimate should be accompanied by a range estimate and analysis of the project's potential scope, cost, and schedule change during RA, broken down by work activity. One copy of the quantity takeoff sheets, including the appropriate items, shall be included with each estimate submitted. All work items shall be broken down into labor, materials, and equipment. The contractor shall provide the basis for development of all unit prices used in the estimate. Unit prices, overhead, profit, and other categories shall be shown as separate items. The final estimate will be based on the advertised plans and specifications including amendments. It should reflect current prices for labor, materials, and equipment. The estimate shall separately identify contingencies within the defined project scope. The contractor shall prepare the RA cost estimates by using the M-CACES Gold Estimating System.

Points for the WAM/RPM to consider: The use of M-CACES Gold Estimating System for the cost estimate is required for RD work assignments under RACs and is recommended under ARCS.

.11.5 Prepare 100-Percent Design Submittal

.11.6 Participate in Prefinal/Final Design Review

The contractor shall participate in a Prefinal Design review meeting. The meeting shall be held at Region ___ headquarters. The contractor shall also consolidate and respond to Intermediate and Prefinal Design review comments. A written response for each comment shall be provided before incorporating the changes into the design. The changes shall be incorporated as part of the 100-Percent Design submittal.

.11.7 Prepare Subcontract Award Documents

The contractor shall prepare complete contract documents, including (1) complete RA SOW including, wherever appropriate, drawings and specifications, complete cost proposal, and the required schedule; (2) terms and conditions of the contract including payments, delivery schedule, point of delivery, and acceptance criteria; (3) method of procurement including evaluation, basis, and method of awarding contract; (4) criteria to be employed in evaluating bids and offers; (5) prevailing wage determinations (DBA); (6) deadline and location for submitting bids and offers, if applicable; and (7) appropriate contract clauses.

.11.8 Perform Biddability, Operability, and Constructability Reviews

3.11.8 *(continued)*

The contractor shall conduct final constructability, biddability, operability, environmental, and claims prevention reviews and document results.

.11.9 Prepare Revised Project Delivery Strategy

.11.10 Document VE Modifications

.11.11 Draft Operations and Maintenance (O&M) Manual

The manual should include the following:

.11.11.1 An operations and maintenance plan that includes a description of normal operation and maintenance including start-up procedures, tasks for operation, tasks for maintenance, prescribed treatment or operation conditions, and schedule for each O&M task

.11.11.2 A description of potential operating problems including common and/or anticipated remedies and useful-life analysis of significant components and replacement costs

.11.11.3 Quality Assurance Plan for O&M including a description of routine monitoring tasks, description of required laboratory tests and their interpretation, required data collection, and location of monitoring points comprising the points of compliance monitoring

.11.11.4 Alternate procedures to prevent releases or threatened releases of hazardous substances, pollutants, or contaminants, which may endanger health and the environment or cause an exceedance of any cleanup standard

.11.11.5 Corrective action to be implemented in the event that cleanup standards for ground water, surface water discharges, and air emissions are exceeded and a schedule for implementing these corrective actions

.11.11.6 Safety Plan for O&M including a description of precautions and necessary equipment for site personnel, safety tasks required in event of systems failure, and safety tasks necessary to address protection of nearby residents.

.11.11.7 Description of equipment including the equipment identification numbers, installation of monitoring components, maintenance of site equipment, and replacement schedule for equipment and installed components

[NOTE: ITEMS 11.6 THROUGH 11.10, INCLUSIVE, ARE NOT INCLUDED IN THE 6-PERCENT DESIGN LIMITATION CALCULATIONS.]

.11.11.8 Records and reporting mechanisms required including daily operating logs, laboratory records, records for operating costs, mechanism for reporting emergencies, personnel and maintenance records, and reports to U.S. EPA, its designates, and the State.

Point for the WAM/RPM to consider: If RA does not require O&M, delete the text and insert “not used” or “N/A” after line item 3.11.11.

.11.12 Construction Quality Assurance Plan

The contractor shall submit as part of the Prefinal Design a draft Construction Quality Assurance (CQA) Plan. The CQA Plan shall be prepared in accordance with “Construction Quality Assurance for Hazardous Waste Land Disposal Facilities” (EPA, October, 1986). The CQA Plan shall then be

3.11.12 *(continued)*

finalized and submitted with the Final Design. At a minimum, the draft QA Plan shall provide requirements for the following elements:

.11.12.1 Responsibility and authority of all organization and key personnel involved in the remediation action construction

.11.12.2 CQA Personnel Qualifications. The contractor shall establish the minimum qualifications of the CQA Officer and supporting inspection personnel.

.11.12.3 Inspection Activities. The contractor shall establish the observations and tests that will be required to monitor the construction and/or installation of the components of the Remedial Action(s). The plan shall include the scope and frequency of each type of inspection to be conducted. Inspections shall be required to verify compliance with environmental requirements and include, but not be limited to, air quality and emissions monitoring records, waste disposal records (e g., RCRA transportation manifests), etc. Inspections shall also ensure compliance with all health and safety procedures.

.11.12.4 Sampling requirements. The contractor shall establish the requirements for sampling activities, sample size, sample locations, frequency of testing, criteria for acceptance and rejection, and plans for correcting problems as addressed in the project specifications.

.11.12.5 Documentation. The contractor shall describe the reporting requirements for CQA activities. This shall include such items as daily summary reports and inspection data sheets.

3.12 Postremedial Design Support

This task consists of support required to prepare contract bidding documents and issue the Invitation for Bids or the Request for Proposals. The task starts with EPA's approval of contract documents developed under Task 11 and ends with the submittal of construction contractors' bids. The contractor shall perform the following postremedial design activities:

.12.1 Prebid (Presolicitation) Activities

.12.1.1 Printing and Distribution of Contract Documents. Print and distribute to prospective bidders the contract documents that were finalized in Task 11.

.12.1.2 Advertising and Soliciting of Bids. Advertise and solicit bids for construction services. An advertisement shall be prepared and published in _____.

(1) Prebid (Presolicitation) Meetings. The contractor shall arrange and attend prebid meetings to provide clarification on plans, specifications, and contract documents to all bidders.

(2) Resolution of Inquiries and/or Issuing Addenda. The contractor shall resolve bidder inquires and document all contact with potential bidders, and issue amendments to contract documents if additional information becomes available that all bidders should be made aware of after solicitation.

(3) On-Site Visits. The contractor shall participate in on-site visits that may be required to further clarify the services required.

.12.2 Preaward Activities

.12.2.1 Receipt of Bids (Offers)

(1) Determination of Responsive, Responsible Bidders (Offerors)

(2) Perform Reference Checks

(3) Prepare Bid (Offer) Tabulation

3.12.2.1 *(continued)*

(4) Perform Bid (Offer) Analysis

.12.2.2 Receipt and review of Followup Items from Lowest Responsible Bidder (Offeror)

.12.2.3 Review of EEO and NOE Requirements and SDB Subcontracting Plans

.12.3 Update Site-Specific Plans

.12.3.1 Modify Site Management Plan (if necessary)

.12.3.2 Modify Sampling and Analysis Plan (if necessary)

.12.3.3 Modify Health and Safety Plan (if necessary)

.12.3.4 Modify Community Involvement Plan (if necessary)

Point for the WAM/RPM to consider:

In some cases, it may be advisable to use this task to initiate the procurement process, although these services can be procured as part of the RA work assignment.

3.13 Work Assignment Closeout

.13.1 Return Documents to Government

.13.2 Duplicate, Distribute, and Store Files

.13.3 Archive Files

.13.4 Prepare Microfiche, Microfilm, and Optical Disk

.13.5 Prepare Closeout Report. The contractor shall include a breakdown on disk of final costs and Level of Effort (by P-level) in the same detail and format as the Work Breakdown Structure (Attachment 2).

Attachment 1
Summary of Major Submittals for the Remedial Design at
_____(Site)

TASK	DELIVERABLE	REF NO.*	NO. OF COPIES	DUE DATE (calender days)	EPA REVIEW PERIOD
3.1.1.2	Site Visit Report		3	10 days after site visit	7 days after receipt of report
3.1.1.4	RD Work Plan		3	30 days after initiation of work assignment (WA)	21 days after receipt of Work Plan
3.1.1.4	Final RD Work Plan		3	15 days after receipt of EPA comments	NA
3.1.2.1	Draft Site Management Plan (SMP)		3	(#) days after approval of RD Work Plan	10 days after receipt of SMP
3.1.2.1	Final SMP		3	(#) days after receipt of EPA comments	NA
3.1.2.3(1)	Draft QAPP	21 8	3	30 days after initiation of WA	21 days after receipt of QAPP
3.1.2.3(2)	Draft FSP	5	3	30 days after initiation of WA	21 days after receipt of FSP
3.1.2.2	Draft HASP	36 19	3	30 days after initiation of WA	21 days after receipt of HASP
3.1.2.3(2)	Final QAPP	21 8	3	15 days after receipt of EPA comments	NA
3.1.2.3(1)	Final FSP	5	3	15 days after receipt of EPA comments	NA
3.1.2.2	Final HASP	36 19	3	15 days after receipt of EPA comments	NA

Attachment 1
Summary of Major Submittals for the Remedial Design at
_____(Site) (continued)

TASK	DELIVERABLE	REF NO.*	NO. OF COPIES	DUE DATE (calender days)	EPA REVIEW PERIOD
3.2.1	Draft Revised CRP	4	3	(#) days after initiation of WA	14 days after receipt of revised CRP
3.2.1	Final Revised CRP	4	3	(#) days after receipt of EPA comments	NA
3.2.2	Fact Sheets		3	As needed	10 days after receipt of fact sheet
3.6.4	Data Evaluation Summary Report		3	10 days after receipt of analytical results from laboratory	15 days after receipt of report
3.7.2	Treatability Study Work Plan	16 41 (FS)	3	45 days after RD Work Plan approved	21 days after receipt of Treatability Study Work Plan
3.7.2	Final Treatability Study Work Plan	16 41 (FS)	3	15 days after receipt of EPA comments	NA
3.7.6	Treatability Study Evaluation Report	16 41 (FS)	3	30 days after completion of Treatability Study	21 days after receipt of report
3.7.6	Final Treatability Study Evaluation Report	16 41 (FS)	3	15 days after receipt of EPA comments	NA
3.8.1	Design Criteria Report		3	45 days after RD work Plan approved	21 days after receipt of report
3.8.1.5	Basis of Design Report		3	45 days after RD Work Plan approved	21 days after receipt of report

Attachment 1
Summary of Major Submittals for the Remedial Design at
_____(Site) (continued)

TASK	DELIVERABLE	REF NO.*	NO. OF COPIES	DUE DATE (calender days)	EPA REVIEW PERIOD
3.8.1.5	Basis of Design Report (Revision)		3	Revised and distributed as necessary (dynamic document)	15 days after receipt of report
3.8.1	Preliminary Plans and Specifications**		3	60 days after RD Work Plan approved	30 days after receipt of plans & specs
3.8.4	VE Screening Report		3	(#) days after RD Work Plan approved	21 days after receipt of report
3.8.5	Response to Design Review Comments		3	(#) days after design review meeting	15 days after receipt of response
3.9.1	List of Long-Lead Procurement Items		3	(#) days after Preliminary Design approved	10 days after receipt of list
3.9.2	Plans and Specifications for Procurement of Long-Lead Procurement Items		3	(#) days after receipt of EPA comments on the Long-Lead Procurement Item List	15 days after receipt of plans & specs
3.10	Intermediate Plans and Specifications^		3	30 days after Preliminary Design approved	21 days after receipt of plans & specs
3.10.7	Value Engineering Report		3	(#) days after initiation of VE Study	21 days after receipt of report
3.10.9	Response to Design Review comments		3	(#) days after Intermediate Design Review Meeting	15 days after receipt of response
3.11	Prefinal Plans and Specifications^^		3	(#) days after Intermediate Design approved	21 days after receipt of plans & specs
3.11.5	100-Percent Design		3	(#) days after prefinal design comment received	NA

Attachment 1
Summary of Major Submittals for the Remedial Design at
_____(Site) (continued)

TASK	DELIVERABLE	REF NO.*	NO. OF COPIES	DUE DATE (calender days)	EPA REVIEW PERIOD
3.11.6	Response to Prefinal Design review comments		3	(#) days after design review meeting	15 days after receipt of response
3.11.7	Draft RA contract documents		3	(#) days after Final Design approved	21 days after receipt of RA documents
3.11.7	Final RA contract documents		3	(#) days after receipt of EPA comments on Draft RA contract documents	NA

*See Attachment 3 for list of references.

**Preliminary Plans and Specifications Submittal Items:
- 3.8.1.1 Project Delivery Strategy and Scheduling
- 3.8.1.2 Preliminary RA Schedule
- 3.8.1.3 Specifications Outline
- 3.8.1.4 Preliminary Drawings and Schematics
- 3.8.1.5 Basis of Design Report
- 3.8.1.6 Preliminary RA Cost Estimate
- 3.8.2 Variances from the ROD

†Intermediate Plans and Specifications Submittal Items:
- 3.10.1 Update Construction Schedule
- 3.10.2 Intermediate Specifications
- 3.10.3 Intermediate Drawings and Schematics
- 3.10.4 Revised Basis of Design Report
- 3.10.5 RA Cost Estimate
- 3.10.8 Variances from the ROD

††Prefinal Plans and Specifications Submittal Items:
- 3.11.1 Prefinal Drawings and Specifications
- 3.11.2 Prefinal Drawing Reductions
- 3.11.3 Final Basis of Design Report
- 3.11.4 Revised RA Cost Estimate
- 3.11.7 Subcontract Award Documents
- 3.11.8 Biddability, Operability, and Constructability Reviews Report
- 3.11.9 Revised Project Delivery Strategy and Schedule
- 3.11.10 Document VE Modifications
- 3.11.11 Draft Operations and Maintenance (O&M) Manual
- 3.11.12 Construction Quality Assurance Plan

Attachment 2
Work Breakdown Structure (WBS) for
Remedial Design (RD)

3.0 Remedial Design

.01 Project Planning and Support

.01 Project Planning
- .01 Attend Scoping Meeting
- .02 Conduct Site Visit
- .03 Evaluate Existing Information
- .04 Work Plan Development
  - .01 Draft Work Plan Development
    - .01 Develop Narrative
    - .02 Develop Cost Estimate
    - .03 Internal QA & Submission
  - .02 Final Work Plan Preparation
    - .01 Attend Negotiation Meeting
    - .02 Modify Draft Work Plan/Cost Estimate
    - .03 Internal QA & Submission

.02 Preparation of Site-Specific Plans
- .01 Develop Site Management Plan
  - .01 Develop Pollution Control & Mitigation Plan
  - .02 Transportation & Disposal Plan (Waste Management Plan)
- .02 Develop Health & Safety Plan
- .03 Sampling & Analysis Plan (Chemical Data Acquisition Plan)
  - .01 Quality Assurance Project Plan
  - .02 Field Sampling Plan
  - .03 Data Management Plan .
- .04 Other Plan(s)

.03 Project Management
- .01 Prepare Periodic Status Reports
  - .01 Document Cost and Performance Status
  - .02 Prepare/Submit Invoices
- .02 Meeting Participation/Routine Communications
- .03 Perform Engineering Network Analysis
- .04 Manage, Track, and Report Equipment Status
- .05 Work Assignment Closeout

.04 Subcontract Procurement/Support Activities
- .01 ID and Procurement of Subcontractors
  - .01 Drilling Subcontractor
  - .02 Surveying Subcontractor
  - .03 Geophysical Subcontractor
  - .04 Site Preparation Subcontractor
  - .05 Analytical Services Subcontractor(s)
  - .06 Waste Disposal Subcontractor
  - .07 Treatability Subcontractor
  - .08 Other(s)
- .02 Establish and Carry Out a QA Program
- .03 Perform Subcontract Management

.02 Community Involvement

.01 Community Involvement Plan (CRP) Development
.01 Conduct Community Interviews
.02 Prepare CRP
.01 Draft CRP
.02 Final CRP
.02 Prepare Fact Sheets
.03 Public Hearing, Meetings, & Availability Support
.01 Technical Support
.02 Logistical & Presentation Support
.03 Public Notice Support (writing, or placement of)
.04 Maintain Information Repository/Mailing List

.03 Data Acquisition

.01 Mobilization/Demobilization
.01 ID field support equipment/supplies/facilities
.02 Mobilization
.01 Site Preparation
.01 Perform Demolition
.02 Clearing and Grubbing
.03 Perform Earthwork
.01 Provide Borrow Pit
.02 Construct Haul Roads
.04 Construct Roads/Parking/Curbs/Walks
.05 Install Storm Drainage/Subdrainage
.06 Install Fencing/Site Security
.02 Installation of Utilities
.01 Install Electrical Distribution
.02 Install Telephone/Communication System(s)
.03 Install Water/Sewer/Gas Distribution
.04 Install Fuel Line Distribution
.03 Construction of Temporary Facilities
.01 Construct Decontamination Facilities
.02 Construct Sample/Derived Waste Storage Facility
.03 Construct Field Offices
.04 Construct Mobile Laboratory
.05 Construct Other Temporary Facilities
.03 Demobilization
.01 Removal of Temporary Facilities
.02 Site Restoration

.02 Field Investigation
.01 Perform Site Reconnaissance
.01 Ecological Resources Reconnaissance
.02 Well Inventory
.03 Residential Well Sampling
.04 Land Survey
.05 Topographic Mapping
.06 Field Screening
.02 Conduct Geological Investigations (Soils/Sediments)
.01 Surface Soil Sample Collection
.02 Subsurface Soil Sample Collection
.03 Soil Boring/Permeability Sampling
.04 Sediments Sample Collection
.05 Soil Gas Survey
.06 Test Pit
.03 Conduct Air Investigations
.01 Sample Collection
.02 Air Monitoring Station

.04 Conduct Hydrogeological Investigations—Ground Water
.01 Well Systems Installation
.01 Accomplish Mobilization
.02 Perform Well Development
.03 Conduct Downhole Geophysics
.04 Install Monitoring Wells
.05 Install Test Well
.06 Install Gas Wells
.02 Collect Samples
.03 Hydro Punch
.04 Conduct Tidal Influence Study
.05 Conduct Hydraulic Tests (Pump Tests)
.06 Perform Ground-Water Elevation Measurement
.05 Conduct Hydrogeological Investigations—Surface Water
.01 Collect Samples
.02 Conduct Tidal Influence Study
.03 Perform Surface Water Elevation Measurement
.06 Conduct Waste Investigation
.01 Collect Samples (Gas, Liquid, Solid)
.02 Derived Waste Disposal (Gas, Liquid, Solid)
.07 Conduct Geophysical Investigation
.01 Surface Geophysical Activity
.02 Magnetometer
.03 Electronmagetics
.04 Ground Penetrating Radar
.05 Seismic Refraction
.06 Resistivity
.07 Site Meteorology
.08 Cone Penetrometer Survey
.09 Remote Sensor Survey
.10 Radiological Investigation
.08 Conduct Ecological Investigation
.01 Wetland and Habitat Delineation
.02 Wildlife Observations
.03 Community Characterization
.04 Identification of Endangered Species
.05 Biota Sampling/Population Studies
.09 Collect Contaminated Building Samples
.10 Disposal of Investigation-Derived Waste

.04 Sample Analysis

.01 Screening-Type Laboratory Sample Analysis
.01 Analyze Air/Gas Samples
.01 Organic
.02 Inorganic
.03 Radiochemistry
.02 Analyze Ground-Water Samples
.01 Organic
.02 Inorganic
.03 Radiochemistry
.03 Analyze Surface Water Samples
.01 Organic
.02 Inorganic
.03 Radiochemistry
.04 Analyze Soil/Sediment Samples
.01 Organic
.02 Inorganic
.03 Radiochemistry
.05 Analyze Waste (Gas) Samples
.01 Organic

.02 Inorganic
.03 Radiochemistry
.06 Analyze Waste (Liquid) Samples
.01 Organic
.02 Inorganic
.03 Radiochernistry
.07 Analyze Waste (Solid) Samples
.01 Organic
.02 Inorganic
.03 Radiochemistry
.08 Analyze Biota Samples
.01 Organic
.02 Inorganic
.03 Radiochernistry
.09 Analyze Bioassay Samples
.10 Perform Bioaccumulation Studies

.02 CLP-Type Laboratory Sample Analysis

.01 Analyze Air/Gas Samples
.01 Organic
.02 Inorganic
.03 Radiochemistry
.02 Analyze Ground-Water Samples
.01 Organic
.02 Inorganic
.03 Radiochemistry
.03 Analyze Surface Water Samples
.01 Organic
.02 Inorganic
.03 Radiochemistry
.04 Analyze Soil/Sediment Samples
.01 Organic
.02 Inorganic
.03 Radiochemistry
.05 Analyze Waste (Gas) Samples
.01 Organic
.02 Inorganic
.03 Radiochemistry
.06 Analyze Waste (Liquid) Samples
.01 Organic
.02 Inorganic
.03 Radiochernistry
.07 Analyze Waste (Solid) Samples
.01 Organic
.02 Inorganic
.03 Radiochernistry
.08 Analyze Biota Samples
.01 Organic
.02 Inorganic
.03 Radiochernistry
.09 Analyze Bioassay Samples
.10 Perform Bioaccumulation Studies

.05 Analytical Support and Data Validation

.01 Prepare and Ship Environmental Samples
.01 Ground-Water Samples
.02 Surface and Subsurface Soil Samples
.03 Surface Water & Sediment Samples
.04 Air Samples

.05 Biota Samples
.06 Other types of media sampling and screening
.02 Coordinate with appropriate Sample Management personnel
.03 Implement EPA-approved Laboratory QA program
.04 Provide Sample Management (Chain of Custody, sample retention, & data storage)
.05 Perform Data Validation
.01 Review analysis results against validation criteria
.02 Provide written documentation of validation efforts

.06 Data Evaluation

.01 Data Useability Evaluation/Field QA/QC
.02 Data Reduction, Tabulation and Evaluation
.01 Evaluate Geological Data (Soils/Sediments)
.02 Evaluate Air Data
.03 Evaluate Hydrogeological Data—Ground Water
.04 Evaluate Hydrogeological Data—Surface Water
.05 Evaluate Waste Data
.06 Evaluate Geophysical Data
.07 Evaluate Ecological Data
.03 Modeling
.01 Contaminant Fate and Transport
.02 Water Quality
.03 Ground Water
.04 Air
.05 Other Modeling
.04 Develop Data Evaluation Report

.07 Treatability Study/Pilot Testing

.01 Literature Search
.02 Develop Treatability/Pilot Work Plan
.03 Bench Test
.01 Procure Test Facility and Equipment
.02 Provide Vendor & Analytical Service
.03 Test and Operate Equipment
.04 Retrieve Sample for Equipment
.05 Perform Laboratory Analysis
.06 Characterize and Dispose of Residuals
.04 Pilot-Scale Test
.01 Procure Test Facility and Equipment
.02 Provide Vendor & Analytical Service
.03 Test and Operate Equipment
.04 Retrieve Sample for Testing
.05 Perform Laboratory Analysis
.06 Characterize and Dispose of Residuals
.05 Field Test
.01 Procure Test Facility and Equipment
.02 Provide Vendor & Analytical Service
.03 Test and Operate Equipment
.04 Retrieve Sample for Testing
.05 Perform Laboratory Analysis
.06 Characterize and Dispose of Residuals
.06 Develop Treatability Study Report

.08 Preliminary Design

.01 Preliminary Design
.01 Recommend Project Delivery Strategy and Scheduling
.02 Prepare Preliminary Construction Schedule
.03 Prepare Specifications Outline

.04 Prepare Preliminary Drawings
.05 Prepare Basis of Design Report/Design Analysis
.06 Prepare Preliminary Cost Estimate

.02 Describe Variances with ROD

.03 Land Acquisition/Easement Requirements
.01 Identify need for, and locations
.02 Provide Technical Support in Land Acquisition Efforts

.04 Conduct and/or assist in Value Engineering (VE) screwing

.05 Respond to Design Review Comments

.06 Participate in Preliminary Design Reviews/Briefing

[NOTE: ITEMS 8.02 THROUGH 8.06, INCLUSIVE, ARE NOT INCLUDED IN THE 6-PERCENT DESIGN LIMITATION CALCULATIONS]

.09 Equipment/Services/Utilities

.01 Identify long-lead equipment services, and/or utilities
.02 Procure long-lead equipment services, and/or utilities

.10 Intermediate Design

.01 Update Construction Schedule
.02 Prepare Preliminary Specifications
.03 Prepare Intermediate Drawings
.04 Prepare Basis of Design Report/Design Analysis
.05 Prepare Revised Cost Estimate
.06 Participate in Intermediate Design Review/Briefing
.07 Perform VE Study and Report Recommendations
.08 Describe Variances with ROD
.09 Respond to Design Review Comments

[NOTE: ITEMS 10.06 THROUGH 10.09, INCLUSIVE, ARE NOT INCLUDED IN THE 6-PERCENT DESIGN LIMITATION CALCULATIONS]

.11 Prefinal/Final Design

.01 Prepare Prefinal Design Specifications
.02 Prepare Prefinal Drawings
.03 Prepare Basis of Design Report/Design Analysis
.04 Prepare Revised Cost Estimate
.05 Prepare 100-Percent Design Submittal
.06 Participate in Prefinal/Final Design Review
.07 Prepare Subcontract Award Document(s)
.08 Perform Biddability (offerability) and Constructability Reviews
.09 Prepare Revised Project Delivery Strategy
.10 Document VE Modifications
.11 Draft O&M Manual
.12 Prepare Construction QA Plan

[NOTE: ITEMS 11.06 THROUGH 11.10, INCLUSIVE, ARE NOT INCLUDED IN THE 6-PERCENT DESIGN LIMITATION CALCULATIONS]

.12 Post Remedial Design Support

.01 Prebid (Presolicitation) Activities
.01 Printing & Distribution of Contract Documents
.02 Advertising/Soliciting of Bids
.01 Prebid (presolicitation) meetings
.02 Resolution of inquiries/Issuing Addenda
.03 On-site visits

.02 Preaward Activities

.01 Receipt of Bids (offers)
.01 Determination of responsive, responsible bidders (offerors)
.02 Perform Reference checks
.03 Bid (offer) Tabulation
.04 Bid (offer) Analysis
.02 Receipt of follow-up items from lowest responsible bidder (offeror)
.03 Review of EEO, MBE requirements, SDB subcontracting plans
.03 Update Site-Specific Plans
.01 Modify Site Management Plan (if necessary)
.02 Modify Sampling & Analysis Plan (if necessary)
.03 Modify Health & Safety Plan (if necessary)
.04 Modify Community Involvement Plan (if necessary)

.13 Work Assignment Close Out

.01 Return Documents to Government
.02 File Duplication/Distribution/Storage
.03 File Archiving
.04 Microfiche/Microfilm/Optical Disk
.05 Prepare Closeout Report

Attachment 3
Regulations and Guidance Documents

The following list, although not comprehensive, comprises many of the regulations and guidance documents that apply to the RD process:

1. American National Standards Practices for Respiratory Protection. American National Standards Institute Z88.2-1980, March 11, 1981.

2. ARCS Construction Contract Modification Procedures September 89, OERR Directive 9355.5-0l/FS.

3. CERCLA Compliance with Other Laws Manual, Two Volumes, U.S. EPA, Office of Emergency and Remedial Response, August 1988 (DRAFT), OSWER Directive No. 9234. 1-01 and -02.

4. Community Relations in Superfund — A Handbook, U.S. EPA, Office of Emergency and Remedial Response, June 1988, OSWER Directive No. 9230.0-3B.

5. A Compendium of Superfund Field Operations Methods, Two Volumes, U.S. EPA, Office of Emergency and Remedial Response, EPA/540/P-87/001a, August 1987, OSWER Directive No. 9355.0-14.

6. Construction Quality Assurance for Hazardous Waste Land Disposal Facilities, U.S. EPA, Office of Solid Waste and Emergency Response, October 1986, OSWER Directive No. 9472.003.

7. Contractor Requirements for the Control and Security of RCRA Confidential Business Information, March 1984.

8. Data Quality Objectives for Remedial Response Activities, U.S. EPA, Office of Emergency and Remedial Response and Office of Waste Programs Enforcement, EPA/540/G-87/003, March 1987, OSWER Directive No. 9335.0-7B.

9. Engineering Support Branch Standard Operating Procedures and Quality Assurance Manual, U.S. EPA Region IV, Environmental Services Division, April 1, 1986 (revised periodically).

10. EPA NEIC Policies and Procedures Manual, EPA-330/9-78-001-R, May 1978, revised November 1984.

11. Federal Acquisition Regulation, Washington, DC: U.S. Government Printing Office (revised periodically).

12. Guidance for Conducting Remedial Investigations and Feasibility Studies Under CERCLA, Interim Final, U.S. EPA, Office of Emergency and Remedial Response, October 1988, OSWER Directive NO. 9355.3-01.

13. Guidance on EPA Oversight of Remedial Designs and Remedial Actions Performed by Potential Responsible Parties, U.S. EPA Office of Emergency and Remedial Response, EPA/540/G-90/001, April 1990.

14. Guidance on Expediting Remedial Design and Remedial Actions, EPA/540/G-90/006, August 1990.

15. Guidance on Remedial Actions for Contaminated Ground Water at Superfund Sites, U.S. EPA Office of Emergency and Remedial Response (DRAFT), OSWER Directive No. 9283.1-2.

16. Guide for Conducting Treatability Studies Under CERCLA, U.S. EPA, Office of Emergency and Remedial Response, Prepublication version.

17. Guide to Management of Investigation-Derived Wastes, U.S. EPA, Office of Solid Waste and Emergency Response, Publication 9345.3-03FS, January 1992.

18. Guidelines and Specifications for Preparing Quality Assurance Project Plans, U.S. EPA, Office of Research and Development, Cincinnati, OH, QAMS-004/80, December 29, 1980.

19. Health and Safety Requirements of Employees Employed in Field Activities, U.S. EPA, Office of Emergency and Remedial Response, July 12, 1982, EPA Order No. 1440.2.

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34. Standards for the Construction Industry, Code of Federal Regulations, Title 29, Part 1926, Occupational Health and Safety Administration.

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36. Structure and Components of 5-Year Reviews, OSWER Directive No. 9355.7-02, May 23, 1991. [Guidance, p. 3-5]

37. Superfund Guidance on EPA Oversight of Remedial Designs and Remedial Actions Performed by Potentially Responsible Parties, April 1990, EPA/540/G-90/001.

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Attachment 4

TRANSMITTAL OF DOCUMENTS FOR ACCEPTANCE BY EPA		DATE:	TRANSMITTAL NO.
TO:	FROM:		☐ New Transmittal ☐ Resubmittal of Transmittal No. _____

SUBTASK NO.	DELIVERABLE	NO. OF COPIES	REMARKS

ACCEPTANCE ACTION	
DOCUMENTS FOUND ACCEPTABLE (LIST BY SUBTASK NO.)	NAME/TITLE/SIGNATURE OF REVIEWER DATE

Attachment 5

TRANSMITTAL REGISTER								
PROJECT TITLE AND LOCATION				CONTRACT NO.			WORK ASSIGNMENT NO.	
Subtask No.	DELIVERABLE	No. of Copies	Due Date	Transmittal No.	Date Received	Date Comments Sent to Contractor	EPA Acceptance Date	REMARKS

APPENDIX B

GENERIC REMEDIATION SCHEDULES*

(Bar Charts B.1-B.9)

*These schedules are divided into the 11 standard tasks for the ARCS (Alternative Remedial Contracting Strategy) contracts, but they can also be used in estimating duration of the 13 standard tasks for RACs (Response Action Contracts) remedial design work assignments.

Chart B.1
Generic Remediation Schedule:
Ground-Water Treatment — Complex

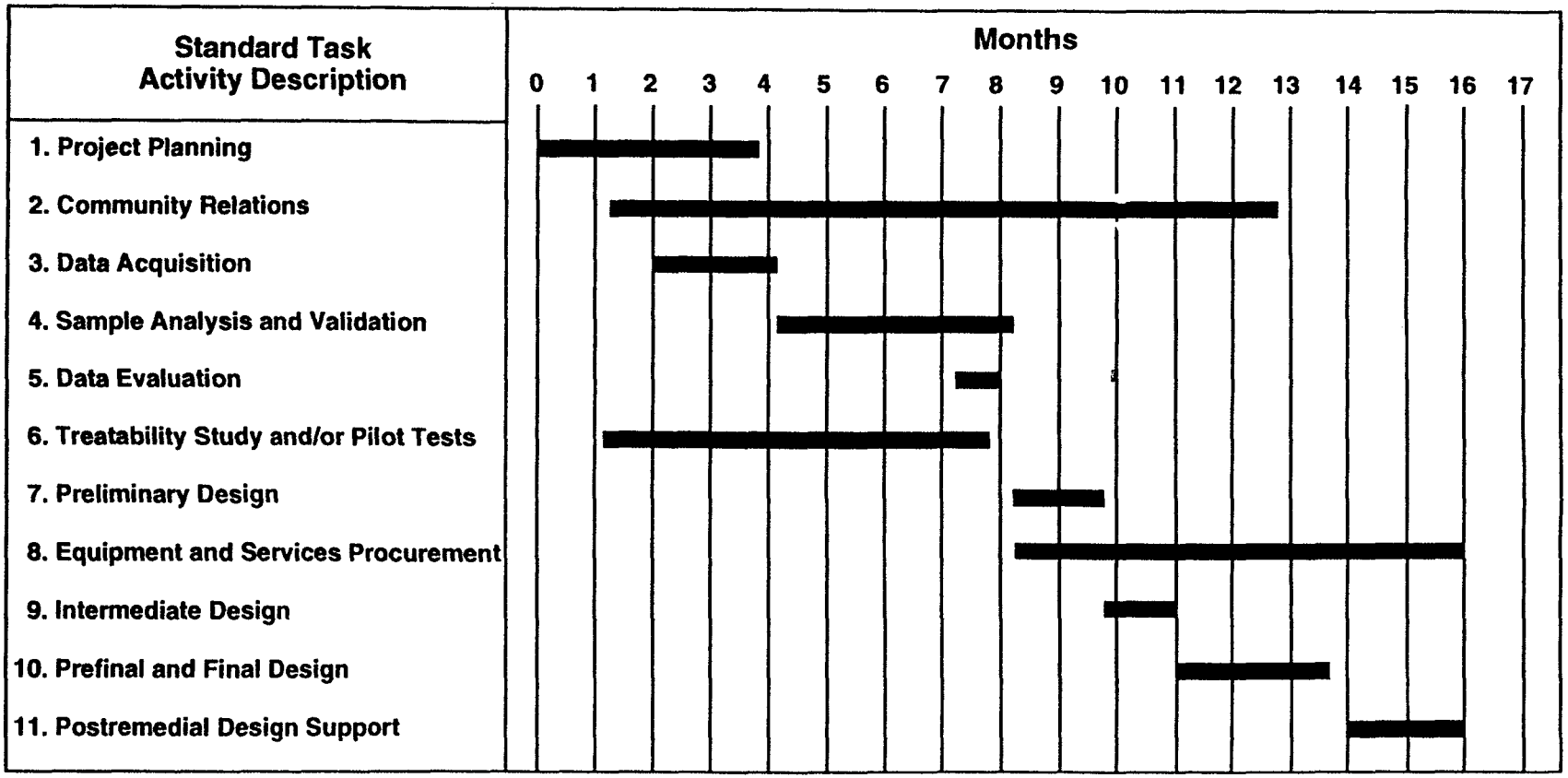


Chart B.2
Generic Remediation Schedule:
Ground-Water Treatment — Simple

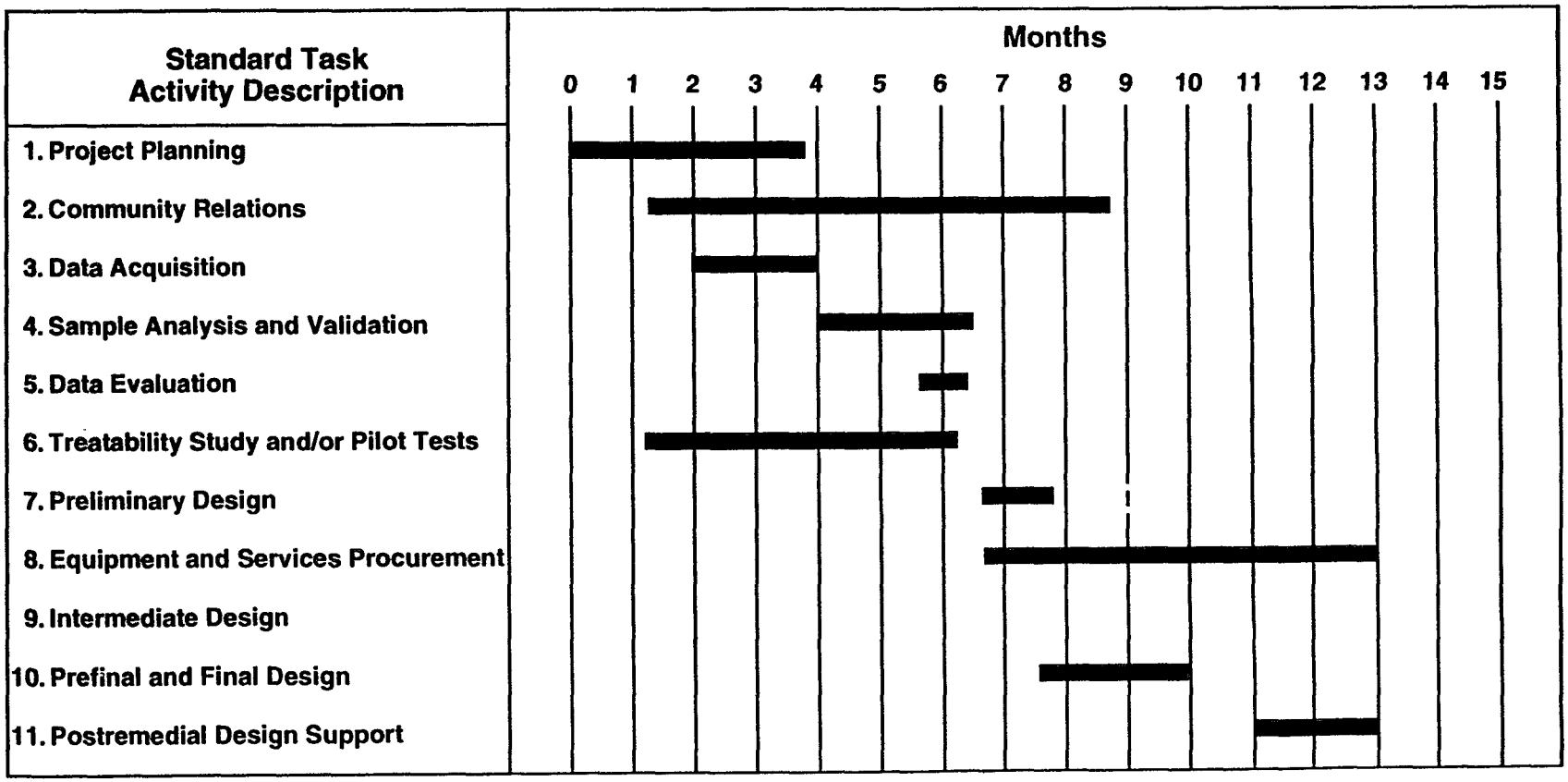


Chart B.3
Generic Remediation Schedule:
Ground-Water Treatment — Simple (Expedited)

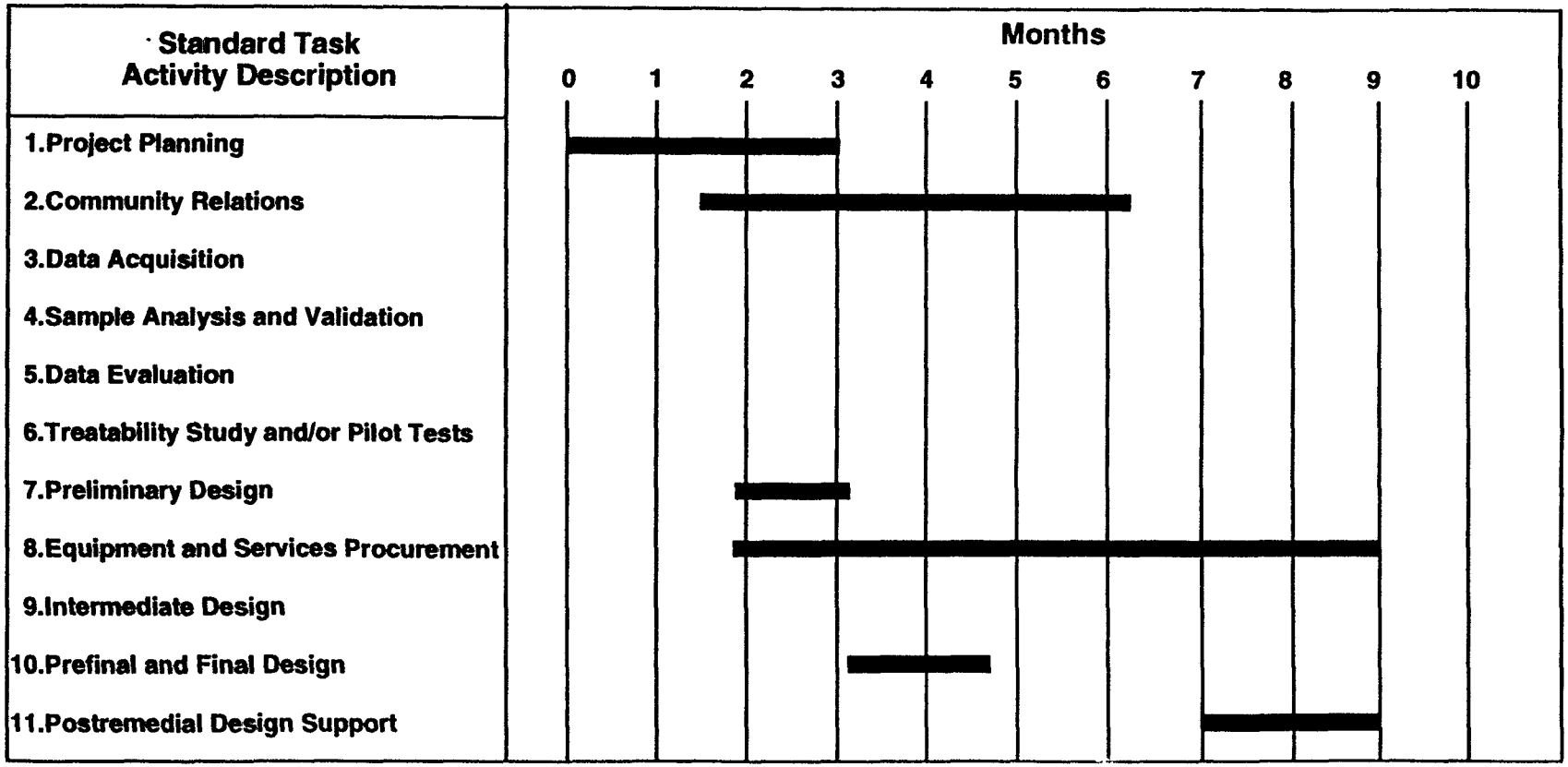


Chart B.4
Generic Remediation Schedule:
Treatment of Soils and Sludge — Complex

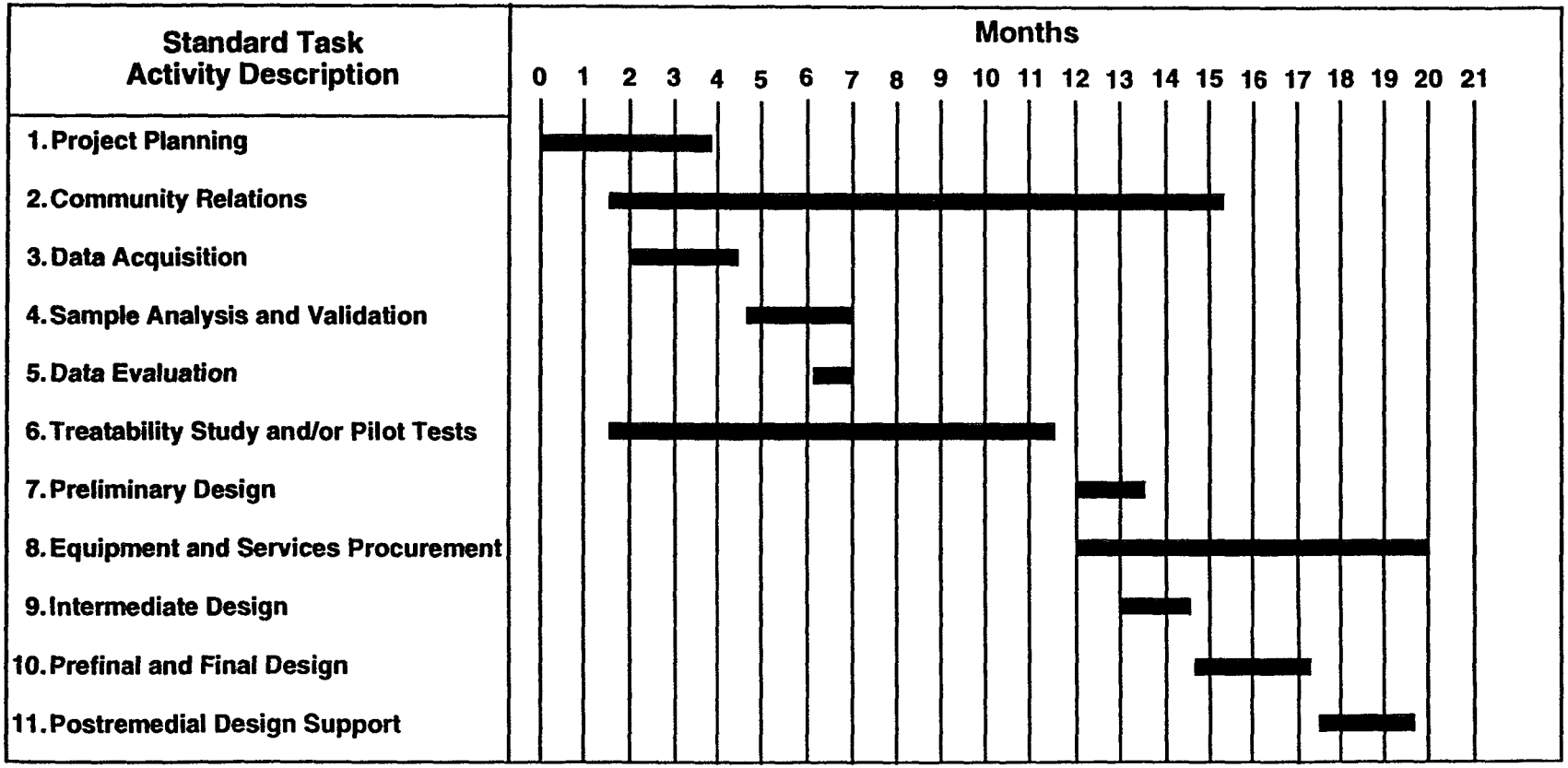


Chart B.5
Generic Remediation Schedule:
Treatment of Soils and Sludge — Simple

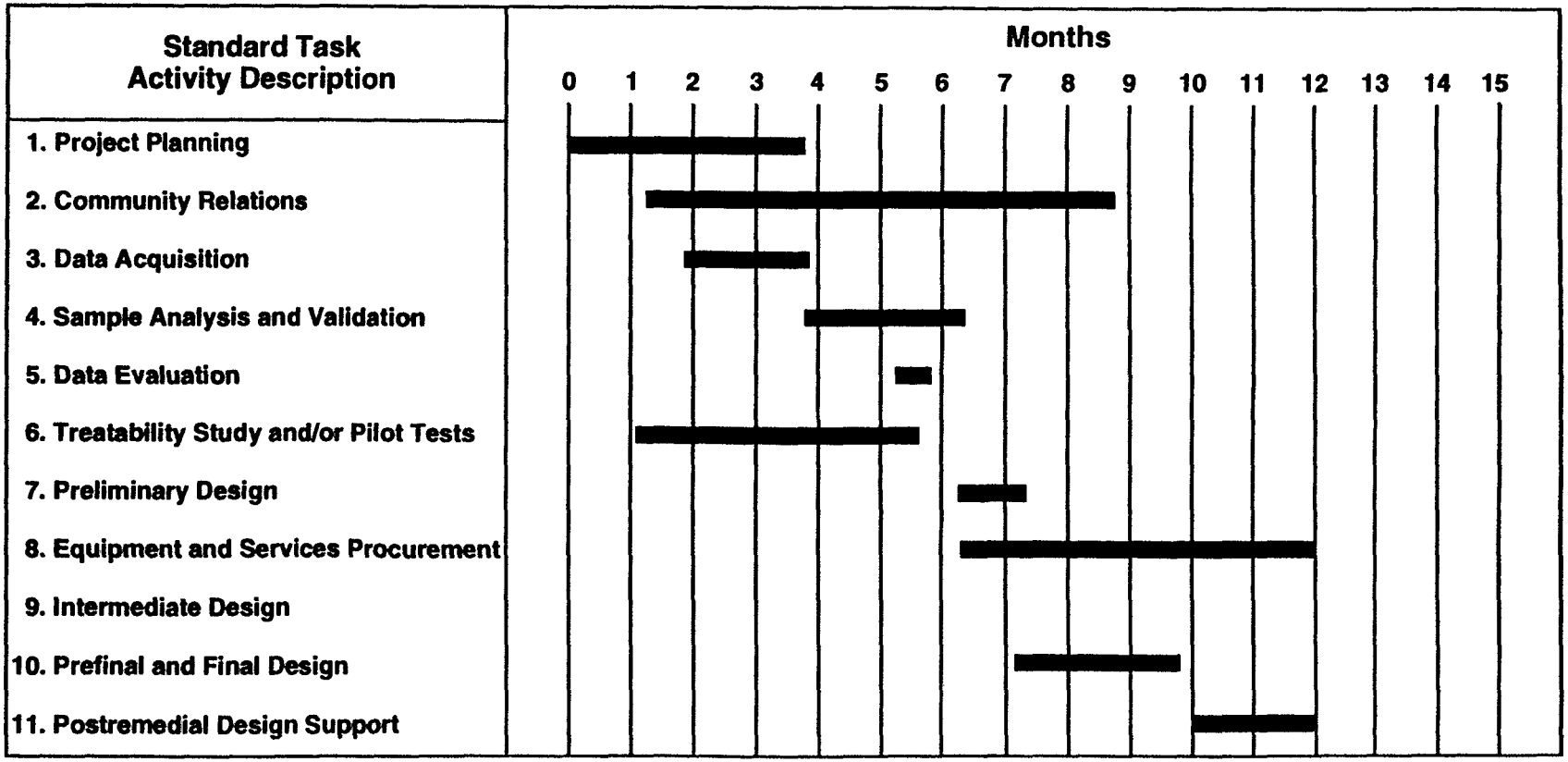


Chart B.6
Generic Remediation Schedule:
Civil Engineering — Complex

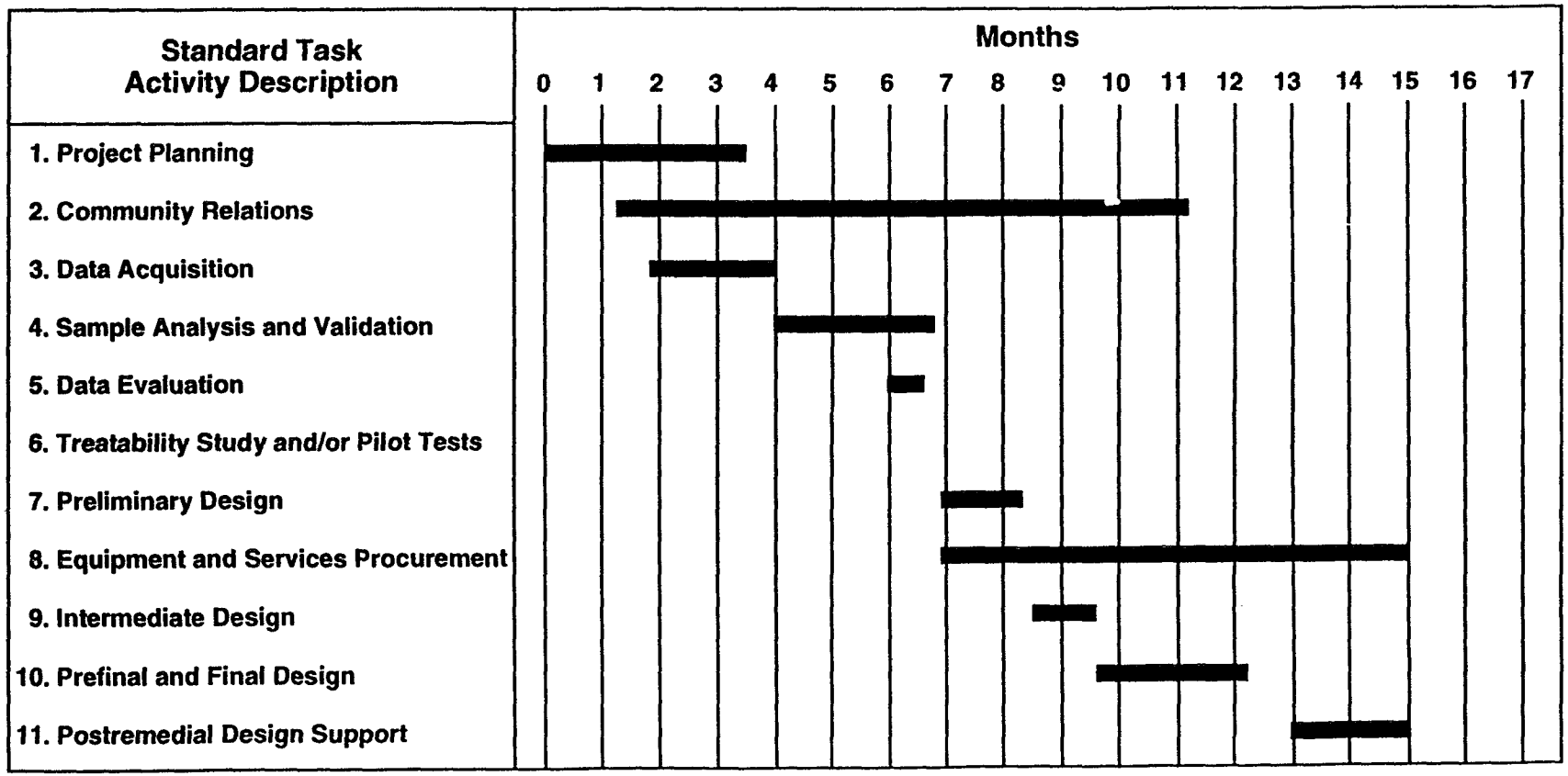


Chart B.7
Generic Remediation Schedule:
Civil Engineering — Simple

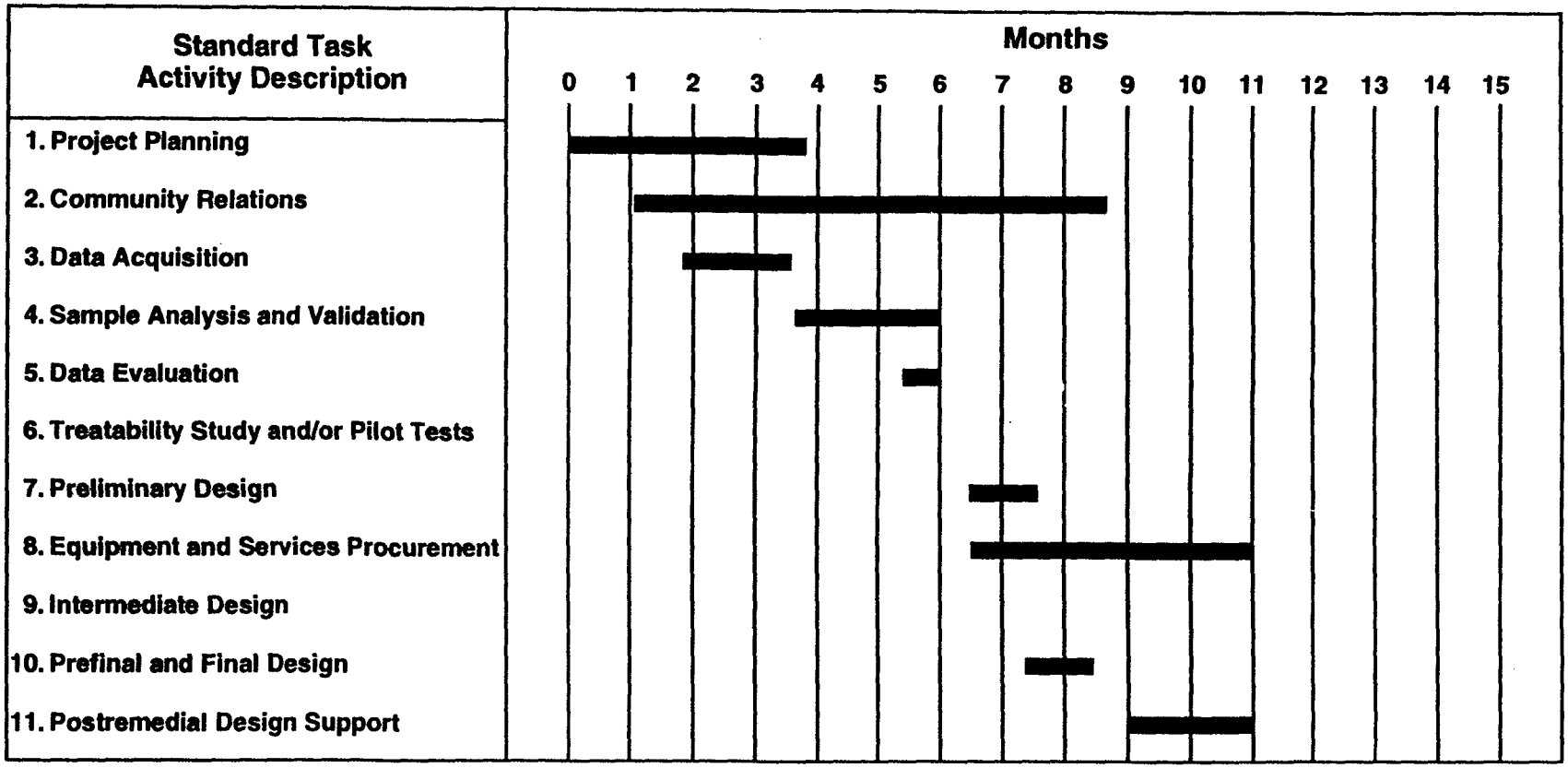


Chart B.8
Generic Remediation Schedule:
Civil Engineering — Simple (Expedited)

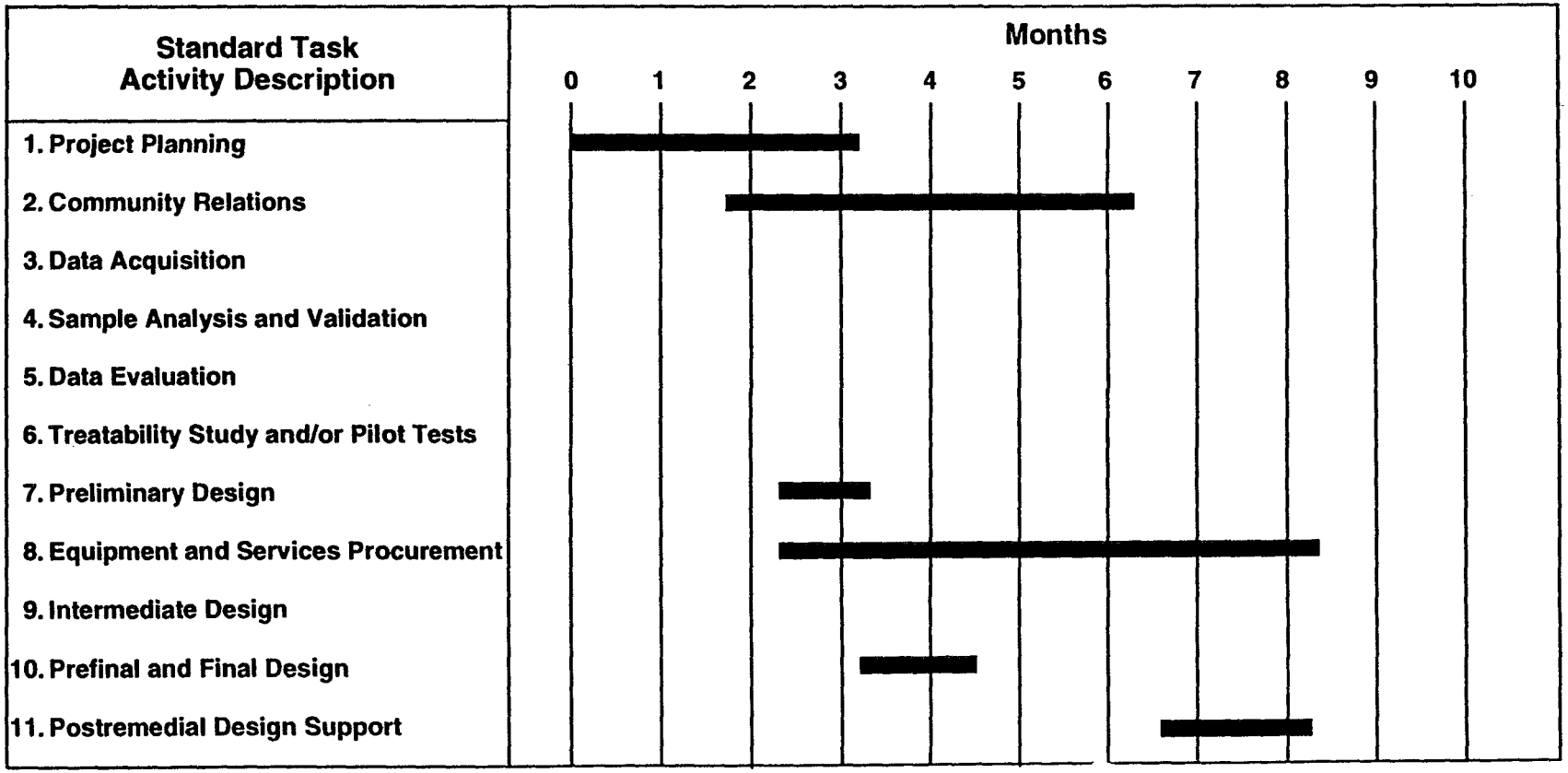
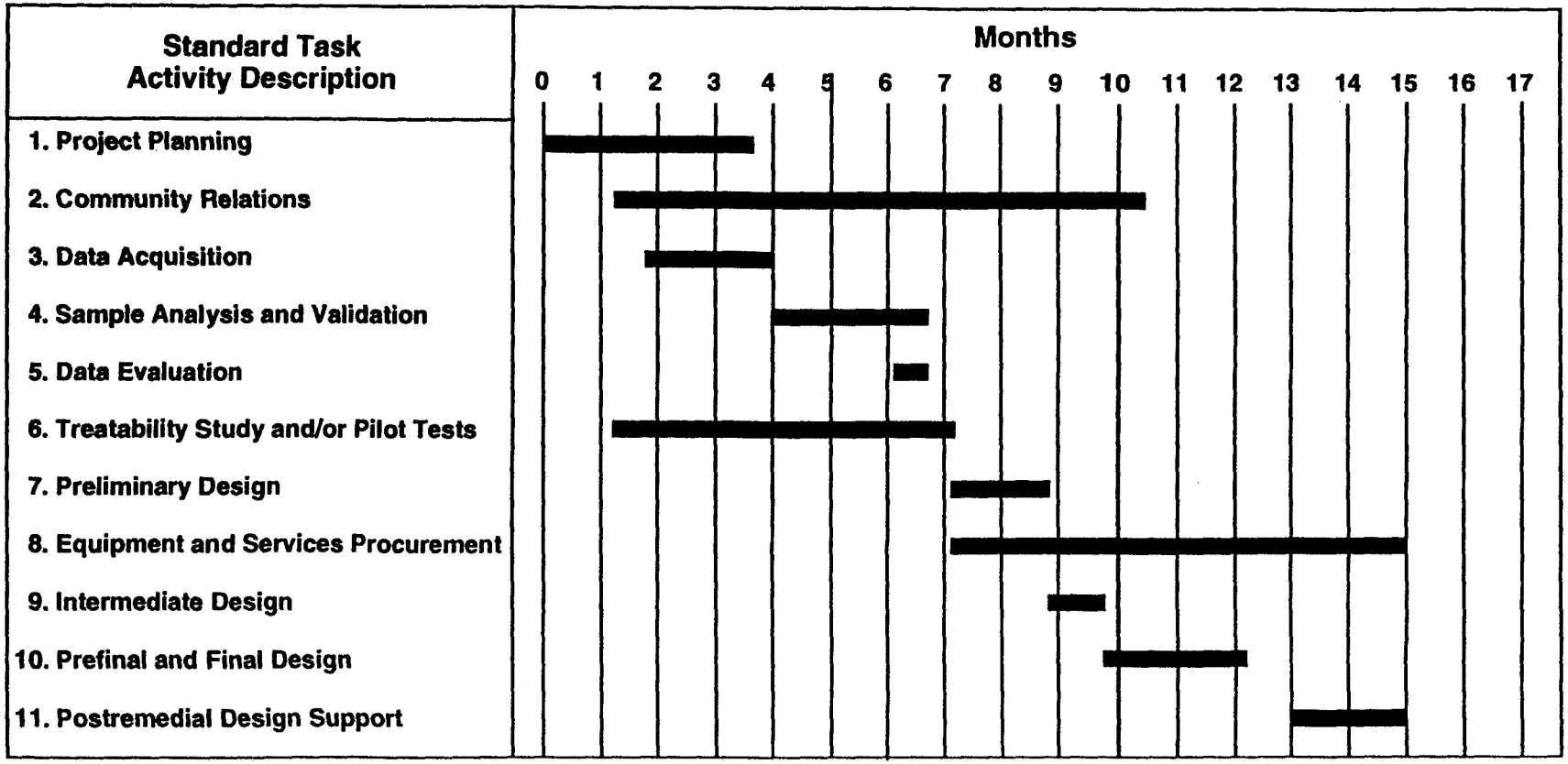


Chart B.9
Generic Remediation Schedule:
On-Site Thermal Destruction



APPENDIX C

EPA GUIDANCE DOCUMENTS

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

JUL 29 1993

OFFICE OF
SOLID WASTE AND EMERGENCY
RESPONSE

OSWER Directive 9202.1-12

MEMORANDUM

SUBJECT: Guidance on Preparing Independent Government Cost Estimates (IGCEs)

FROM: Timothy Fields Jr., Director /s/
Superfund Revitalization Office

Betty L. Bailey, Director /s/
Office of Acquisition Management

TO: Director, Waste Management Division
Regions I, IV, V, VII
Director, Emergency and Remedial Response Division
Region II
Director, Hazardous Waste Management Division
Regions III, VI, VIII, IX
Director, Hazardous Waste Division
Region X
Director, Environmental Services Division
Regions I, VI, VII, X
Assistant Regional Administrators
Regions I **S** X

PURPOSE

The purpose of this memorandum is to transmit the guidance on roles and responsibilities for preparing Independent Government Cost Estimates (IGCEs) for remedial and enforcement work assignments, and for conducting and documenting work plan negotiations in the Superfund program.

BACKGROUND

As you are aware, OSWER Directive No. 9242.2**S**06, issued on January 31, 1992, required independent government cost estimates

to be developed by the technical program office prior to the issuance of any work assignment estimated to exceed $25,000. This provision is applicable to contracts that utilize a work plan/work assignment administrative process.

In recognition of the need for guidance in this area, the Superfund Revitalization Office (SRO) began work on this Directive in the summer of 1992. A cost estimating workgroup, consisting of POs, COs, RPMs, and Estimators/Coordinators in the Regions, was formed to assist in drafting the guidance and reach consensus on a wide array of issues relating to IGCEs. In addition, the SRO obtained, through an interagency agreement, the services of a cost estimator from the Bureau of Reclamation. This person (Ken Beebe) was the lead for this effort at Headquarters.

Significant issues raised by the Office of Inspector General (OIG) and the Office of Acquisition Management (OAM) resulted in appropriate changes to the guidance to reflect agreements reached. During the guidance development process, there were several opportunities for Regional and Headquarters Offices to comment on drafts of the guidance. All comments received were considered and discussed at higher management levels as appropriate. The resulting document reflects decisions reached. This guidance represents the culmination of efforts of many different people, and especially significant are the contributions of Regional personnel who worked tirelessly to help resolve issues and finalize the document.

IMPLEMENTATION

This guidance should not have a major impact on Regional operations since all Regions have been preparing IGCEs for some time now. All Regions should utilize this guidance effective immediately in preparing IGCEs and conducting work plan negotiations.

Questions concerning the guidance should be addressed to Ika Joiner, Superfund Acquisition Manager, at (202) 260-0840.

Attachment

cc: Rich Guimond
Ika Joiner
Henry Longest, OERR
Jerry Clifford, OWPE
Diane Balderson, OAM
Regional SF Branch Chiefs
Reg. Contracting Officers' Supervisors
Attendees of 1st Cost Estimators' Meeting
Marty Cook, OAM
Don Hambric, OAM
Pat Patterson, OAM
Rick Thurston, OAM
Marlene Suit, OS-110W
Superfund Documents Center

GUIDANCE ON ROLES AND RESPONSIBILITIES FOR PREPARING INDEPENDENT GOVERNMENT COST ESTIMATES (IGCEs) FOR REMEDIAL AND ENFORCEMENT WORK ASSIGNMENTS, AND CONDUCTING AND DOCUMENTING WORK PLAN NEGOTIATIONS IN THE SUPERFUND PROGRAM

I. PURPOSE

The Office of Solid Waste and Emergency Response (OSWER) Directive 9242.2-06, dated January 31, 1992, requires the development of IGCEs for any new work assignment or work assignment modification expected to exceed $25,000. This requirement, along with other procedures discussed in this guidance, are being implemented to improve contract management within the agency.

The purpose of this guidance is to provide information and establish minimum requirements regarding the roles and responsibilities of the Work Assignment Manager (WAM), Project Officer (PO), and Contracting Officer (CO) for: 1) preparing Independent Government Cost Estimates (IGCEs) for remedial and enforcement work assignments in the Superfund program; 2) performing reviews of the contractor's work plan and budget, and 3) preparing for, conducting and documenting negotiations with the contractor for the work plan and budget. This guidance is applicable to those enforcement contracts where COs, POs, and WAMs are co-located and all regional and zone remedial contracts (i.e., ARCS contracts as well as the Long-term Contracting Strategy (LTCS) contracts that use Work Assignments as the ordering document and are managed in the Regions). Regions may supplement this guidance with policies which address specific needs and which provide detailed instructions incorporating specific Regional requirements. These policies however, cannot contradict or supersede this guidance.

This document does not provide detailed guidance on how to arrive at specific costs but does give an overview of what should be considered in the preparation of IGCEs, review of the Work Plan, and resolution of pricing issues through negotiations. For more guidance on this subject, please refer to the document "EPA INDEPENDENT GOVERNMENT COST ESTIMATING GUIDE" prepared and issued by the Office of Acquisition Management (OAM). The OAM guide provides a thorough overview for preparing an IGCE, references for confirmation and information on indirect rates, and sample forms and examples.

II. BASIC CONSIDERATIONS

A. CONTRACT MANAGEMENT TEAM (CMT)

In order to ensure an effective and efficiently run Superfund program for each project, it is essential that the CMT be properly structured with the necessary interdisciplinary skills. Therefore, at a minimum, the CMT should consist of the Work Assignment Manager (WAM), the Project Officer (PO), and the Contracting officer (CO). Others, such as contract specialist, cost estimator/coordinator, technical experts, the Bureau of Reclamation (BOR) or U.S. Army Corps of Engineers (USACE) may be included as team members.

The ability of the CMT to function as a team is essential and each team member plays an important supporting role. Good communications are necessary for effective operations of the CMT.

B. STATEMENT OF WORK (SOW)

The single most important component in the successful development of an IGCE is a clearly defined SOW and detailed specification. Model SOWs should serve as the basis for developing more detailed SOWs which are then customized for the particular site. Standard tasks from the contract specifications being utilized should be used as much as practicable in describing the work to be performed. All assumptions should be included in the SOW. The SOW should clearly define what the Government desires from a product, project or service. It should provide information on the product/service required along with the schedule (milestones) and location of the deliverables. An accurate and defendable IGCE cannot be prepared without a clear, complete and concise SOW and detailed specifications. The SOW is the basis for both the IGCE and the evaluation of the contractor's proposal. A good SOW should provide the necessary foundation for EPA to obtain the goods and services it contracts for at a fair and reasonable cost and to get the best product, project or service on time and within the budget.

III. IGCE DEVELOPMENT

A. DEFINITION

An IGCE is the Government's estimate of what the government thinks it should cost to accomplish the SOW or solicitation/ specifications. The ICCE shall not be divulged to the potential contractor and shall be marked "CONFIDENTIAL **S** FOR OFFICIAL USE ONLY". All assignments or amendments that require an IGCE, generally fall into two categories: those consisting mostly of Level Of Effort (LOE) hours, and those that not only contain LOE but need to estimate the anticipated cost of construction (CCE) as well.

B. LOE ESTIMATES

The WAM is responsible for the development of the IGCE. Where in-house cost estimators/coordinators are available, the WAM may utilize these individuals when developing the IGCE. If the WAM intends to extensively involve the cost estimator/coordinator in the IGCE process, it is essential that estimators/coordinators be kept informed and involved from the earliest time possible.

The IGCE must be based on supporting data such as historical information from previously completed work, cost estimating guidelines, engineering standards, or professional judgement. All assumptions, including rationale, used in developing the IGCE shall be clearly defined in writing and shall be part of the IGCE package. Estimates must, at a minimum, be broken out by task and subtask as outlined in the SOW, and by cost element such as labor, travel, other direct cost, subcontract expense, overhead G&A expense, and fee. The estimate shall not be structured to equal the funding document accompanying the Work Assignment Form (WAF). The estimate shall be realistic of the resources necessary to accomplish the tasks detailed in the SOW. One of the most important elements in the Government cost estimate is the estimate for labor hours. Labor hours must be estimated by skill category (P level) as defined in the contract, and by task.

The IGCE shall be prepared before the CO will accept the Procurement Request (PR). This IGCE can be considered a preliminary estimate prior to having a technical scoping meeting with the contractor if desired, or a final estimate when no scoping meeting is required. A preliminary estimate is defined as the total LOE and dollar amount for all work anticipated in the SOW. The estimates can be based on historical costs for similar work. The major assumptions and rational shall be included with the preliminary estimate. If a technical scoping meeting is required, the

preliminary estimate must be revised to reflect any changes made to the SOW and then will be considered the final estimate, but in all cases, it shall be completed prior to receipt of the work plan. If a technical scoping meeting is required, it shall be limited solely to the technical aspects of the assignment, and not involve cost. In the event that no technical scoping meeting is held, the IGCE shall accompany the SOW and shall be forwarded to the CO as part of initiation of the work assignment. Estimates shall, be signed and dated by the WAM and the estimator/coordinator or PO (if involved in the IGCE preparation).

When the contract SOW presents specific, standardized tasks, the tasks presented in the SOW and the IGCE shall be organized, structured and presented in a manner consistent with and comparable to the contract SOW.

When an approved workplan is modified and expands/decreases the activities, or increases/decreases the LOE, the tasks in the modification and the IGCE shall be organized, structured and presented in a manner consistent and comparable with the tasks presented in the approved work plan.

C. CONSTRUCTION ESTIMATES

A preliminary construction cost estimate (CCE) for the Remedial Action is developed first at the RI/FS stage. A more detailed CCE is developed during the Remedial Design process and then finalized based upon the solicitation/specification package. The CCE shall be a detailed estimate itemizing the principle elements of the cost to the contractor (including indirect costs, and the addition of profit) to perform the work required by the specifications. Detailed estimates are developed using a step-by-step process, planning the project in the same manner as a contractor would plan, organize, and conduct it. They are based on the type and quantities of labor, equipment, and material required to perform the work. Consideration should be given to production rates, projected weather delays, schedule impacts, type of technology to be used, site accessibility, safety, haul routes and distances, and availability of materials and equipment. Supporting documentation should include narratives addressing the site visit, pre-bid conference, the facts and assumptions used in the preparation of the estimate, as well as specific references to source material used.

1. REMEDIAL DESIGN BY A&E CONTRACTOR

The A&E contractor to whom the Remedial Design is awarded may or may not be specifically tasked to develop a detailed CCE as part of the design process. Listed below are the alternative methods that the Regions should use in the development of CCEs.

a. - Use of EPA Staff To Develop CCE:

For those EPA Regions having in-house construction experience and technical expertise, the CCEs should be developed using available staff resources. This will serve as EPA's official CCE for the Remedial Action. If this approach is taken, the A&E contractor should not be tasked to develop a CCE (such duplication of effort would not be cost effective).

b. - Use of Other Federal Agencies to Review A&Es CCE:

If Regional staff require assistance because of work load or lack of technical expertise in project construction, the A&E contractor will prepare the CCE and the WAM shall avail him/her self of the technical expertise and knowledge of other federal agencies, such as the Bureau of Reclamation or the U.S. Army Corps of Engineers, through inter-agency agreements, to assist in reviewing the A&E contractor's estimate. Once the contractor's CCE has been reviewed, modified if necessary, and approved by the EPA, it shall serve as EPA's official CCE. This CCE will become the subcontract portion of the Remedial Action IGCE if it is provided to the prime for subcontracting.

c. - Use of Other Federal Agencies to Develop the CCE:

If regional staff require assistance because of work load or lack of technical expertise in project construction, the WAM shall avail him/her self of the technical expertise and knowledge of other federal agencies, such as the Bureau of Reclamation or the U.S. Army Corps of Engineers, through inter-agency agreements, to develop a CCE based upon the A&E contractor's solicitation/specification package. Once the other agency's CCE has been reviewed, modified if necessary, and

approved by the EPA, it shall serve as EPA's official CCE. This CCE will become the subcontract portion of the Remedial Action IGCE. If this approach is taken, the A&E contractor should not be tasked to develop a CCE (such duplication of effort would not be cost effective).

2. REMEDIAL DESIGN BY OTHER FEDERAL AGENCIES

When the WAM chooses to use another federal agency to develop the Remedial Design, the responsibility for the development of the detailed CCE is incorporated as part of the SOW and Interagency Agreement (IAG). That CCE will become the IGCE for the Remedial Action.

3. ARCS CONSTRUCTION CONTRACT MODIFICATION

OSWER Directive 9355.5-01/FS, dated September 1989, provides guidance on how ARCS construction contract modifications shall be processed (copy attached).

IV. REMEDIAL ACTION

For Remedial Action work assignments, an IGCE for the A&E contractor’s efforts associated with the award, management and oversight of the construction subcontractor must be completed. For this portion of the Remedial Action, the LOE estimate guidance noted earlier should be followed. The CCE developed during the Remedial Design phase, as outlined in III, c. 1. a., b., c., and 2, shall be incorporated as part of the overall Remedial Action IGCE.

V. WORK PLAN REVIEW

Upon receipt of the contractor's work plan and proposed budget, members of the CMT shall perform a technical and cost analysis.

A. Technical Analysis:

A technical analysis means the examination and evaluation by personnel having knowledge, skills, experience, or capability in engineering, science, or management of proposed quantities and kinds of materials, labor, and processes, and associated factors set forth in the proposed work plan. This analysis will determine and report on the need for reasonableness of the proposed resources.

During the technical review it may be necessary to have fact finding discussions with the contractor. These discussions do not include negotiation or resolution of differences with the

contractor in the total work plan or individual elements. Instead, the results of this discussion should be used to provide the CO with sound recommendations for establishing the Pre-Negotiation Objectives. These recommendations should include a narrative for: (1) reconciling the IGCE and the contractor's cost estimate based on fact finding; and (2) a summary of any remaining differences for negotiation.

A fact finding discussion is only for use in understanding the contractor's basis in developing the Work Plan/Cost Estimate. The individual conducting the fact finding shall inform the CO that such a discussion is warranted and the CO shall inform them if she/he will participate.

B. Cost Analysis:

A cost analysis means the review and evaluation of the separate cost elements of (a) the contractor's work plan and (b) the judgmental factors applied in developing the work plan budget/estimate. This analysis will enable the reviewer to form an opinion on the degree to which the proposed work plan cost estimate represents and what the cost of the SOW should be, assuming reasonable economy and efficiency.

The CMT should compare the technical aspects of the work plan with the SOW and evaluate the differences between the IGCE and the contractor's proposal. Special emphasis should be given to the total hours and dollars, hours and skill mix per task, subcontract costs, and schedule. It should again be emphasized that the WAM should call upon the expertise of other technical disciplines to aid in review of the work plan.

C. Roles and Responsibilities for Work Plan Review:

The following is a brief summary of the recommended roles and responsibilities of WAMs, POs, and COs in the work plan review process; however, the specific roles and responsibilities may differ from region to region.

1. Work Assignment Manager (WAM)

- **!** reviews work plan to determine if work plan is appropriate, reasonable, and complete;
- **!** provides quality control role within the work plan review process;
- **!** determines if contractor's work plan is responsive to SOW;
- **!** reviews number of hours and skill mix to determine appropriateness for tasks;

- reviews proposed schedule, equipment, health & safety requirements, travel/ODCs, deliverables, subcontract needs/use;
- reviews qualifications of contractor personnel for appropriateness;
- determines if tasks fit SOW, that no excess work is proposed, and costs proposed for tasks are reasonable;
- identifies issues that require CO/PO attention;
- initiates, conducts and documents fact finding discussions if needed; and
- summarizes comments in a work plan memorandum to the PO and CO on a task/subtask level, including a comparison of the contractor's cost proposal with the IGCE and makes recommendations regarding variances between the two.

2. Project Officer (PO)

- reviews work plan to determine if it is appropriate, reasonable, and complete;
- provides quality control role within the work plan review process;
- reviews project planning and project management activities;
- reviews qualifications of contractor personnel for appropriateness;
- reviews schedule(s) and deliverables;
- reviews equipment requirements - prepares 7 point justifications as appropriate;
- compares work plan with IGCE and SOW;
- initiates, conducts and documents fact finding discussions if needed; and
- reviews the WAM's technical review memorandum and/or provides additional comments as appropriate.

3. Contracting Officer (CO)

- **!** reviews proposed labor, ODCs, indirect rates, and fees;
- **!** compares work plan with IGCE and SOW;
- **!** reviews need for overtime premium, if proposed;
- **!** reviews for appropriate use of subcontracting;
- **!** reviews for compliance with contract, FAR, etc.;
- **!** reviews work plan for personal services and/or inherently governmental functions;
- **!** requests clarification(s) from CMT members, when necessary;
- **!** reviews role/responsibility of team subcontractors;
- **!** reviews work plan for special contract provisions;
- **!** initiates, conducts and documents fact finding discussions and participates in them if initiated by WAMs and POs when warranted;
- **!** receives, reviews, and supplements the technical review memorandum as a basis for subsequent discussions with the contractor or possible future pre-negotiation and negotiation documentation; and
- **!** approves the work plan.

If necessary, a designated member of the CMT shall consolidate the work plan comments and send only the technical comments without any cost related issues to the contractor through the CO for the contractor's review with a request to provide a response within a reasonable time frame. Cost estimators/coordinators, contract specialists or other technical experts that assisted in the preparation of the IGCE may also provide assistance during review of the contractor's work plan and/or negotiations. If the CMT determines that the work plan is to be approved as submitted, the proper documentation supporting the CMT's decision shall be prepare.

VI. NEGOTIATIONS

The CO discusses with the CMT the need for negotiations. The CO is responsible for leading the team in developing its negotiation objective(s). In no event are negotiations to be delegated to the WAM or PO. Although each team member should assure that all issues are properly addressed and properly documented, the CO is

ultimately responsible for ensuring that documentation of the negotiation outcome is adequate. Once negotiations are completed and an agreement has been reached, the work plan is approved by the Contracting Officer. In the event that no negotiations are required, the documentation for work plan approval shall be processed.

Upon receipt of the contractor's work plan, any significant changes in the tasks, schedule or budget are accomplished through negotiations between the Agency and the contractor. The Contracting Officer shall conduct those negotiations. When determined by the CO, the appropriate personnel (WAM, PO, E/C, etc.) will also participate in the negotiations.

Roles and Responsibilities for Negotiations:

The following is a brief summary of the recommended roles and responsibilities of WAMs, POs, and COs in the negotiation process; however, the specific roles and responsibilities may differ from region to region.

1. Work Assignment Manager (WAM)

- **!** provides technical expertise to PO and CO for negotiation session.
- **!** prepares technical documentation solicited by CO and/or PO.

2. Project Officer (PO)

- **!** coordinates with other members of the CMT.

3. Contracting Officer (CO)

- **!** ensures pre-negotiation documentation is adequate.
- **!** meets with CMT members to establish negotiation strategy.
- **!** conducts negotiations or approves negotiations conducted by contract specialist.
- **!** ensures post-negotiation documentation is adequate.

If negotiations are held, the following provides a framework for documentation.

VII. DOCUMENTATION

Throughout the entire process, the CMT shall maintain adequate written documentation of the significant differences and acceptability between the Government's position and the Contractor's work plan and budget. Particular attention should be paid to documenting the Government's negotiating position and the results of the actual negotiations between the government and contractor.

A. PRE-NEGOTIATION DOCUMENTATION

The pre-negotiation documentation summarizes the Agency's position and objective it hopes to accomplish during negotiations with the contractor. Objectives should be based upon the review of the contractor's work plan, the IGCE and other information available regarding the work to be performed. The document shall show the work assignment number, contractor's name, contract number, site name, a summary of the contractor's proposal and the IGCE, and present the Agency's position upon entering negotiations. A target position for the major cost elements shall be included. The document shall be prepared by the CO/CS with input from other members of the CMT prior to negotiations and is used as a guide during the negotiations. The pre-negotiation memorandum shall be signed and dated by the Contracting Officer.

B. POST-NEGOTIATION DOCUMENTATION

The post-negotiation documentation summarizes and documents negotiations with the contractor with emphasis on the reconciliation of differences between the IGCE and the contractor's work plan, pre-negotiation position and the negotiated agreement. It is prepared by the contracting officer with input from other CMT members. The memorandum should include the following information:

1. The purpose of the negotiations.

2. A description of the work, including the contract number, work assignment number and site name.

3. The name, position, and organization of each person representing the contractor and the Government in the negotiations.

4. The date, time, and place of the negotiations.

5. The summary of the negotiated items (cost, technical scope and schedule), and justification for agreement to estimated costs or statement of work significantly different from the Agency’s pre-negotiation position. The task breakdown, costs, hours and skill mix of the government objective, the contractor’s initial proposal and that final negotiated items should be presented in matrix format for easy reference and comparison.

6. A statement to the effect that the negotiated agreement is determined to be fair and reasonable.

The post-negotiation memorandum must be signed and dated by the Contracting Officer.

United States Environmental Protection Agency | Office of Emergency and Remedial Response Washington, DC 20460 | Directive: 9355.5-01/FS September 1989

Superfund

EPA

THE HAZARDOUS SITE CONTROL DIVISION'S
DESIGN AND CONSTRUCTION MANAGEMENT GUIDE SERIES

ARCS CONSTRUCTION CONTRACT MODIFICATION PROCEDURES

During the performance of a construction project it is often necessary to modify the contract to allow changes in the work which are required by actual conditions at the site. These contract modifications are accomplished either through bilateral modifications, which result in "supplemental agreements" to accomplish the work, or through unilateral modifications, which result in "change orders" to the constructor to accomplish the work.

This document describes the contracting relationships, as well as technical reviews and administrative procedures required to process supplemental agreements and change orders for changed work in Remedial Action construction projects which are subcontracts under EPAs ARCS contracts. These procedures are orientated towards fixed price contracts. Contract modifications in time and materials contracts will differ. These procedures do not cover the situation where the need for the change is in dispute. Disputes and claims will be presented in a subsequent guidance. Assistance with the implementation of these procedures may be requested from the Design and Construction Management Branch in HSCD.

RESPONSIBILITIES AND AUTHORITIES

The construction contracting relationship under ARCS involves two distinct spheres of authority. The first is the contractual relationship between the ARCS prime contractor and the subcontractor for construction. For the sake of simplicity, the subcontractor for construction will be called the "Constructor". The second sphere of authority is the contractual relationship between the ARCS prime contractor and the Federal Government All changes to ARCS construction work will involve actions at both the subcontract and the prime contract level.

Within the first sphere of authority at the subcontracting level, the authority to approve changes to the work will reside with a designated senior member in the ARCS firm. The Federal government is not a direct party to any ARCS subcontract, and therefore cannot direct or order the Constructor to accomplish changed work.

The procedures used by the ARCS Construction Management Team for processing changes will also vary depending on the size and complexity of the construction project and will reflect the internal management structure of ARCS firm. On large construction projects the team may include a Construction Manager, a Resident Engineer, a Construction Representative or Construction Inspector, various technical review and design engineers, and other support staff. In a case such as this, the Resident Engineer and various technical review and design engineers may be involved in analyzing and negotiating a change, but the authority to approve would reside only with a senior person within the ARCS firm who has the authority to commit the ARCS firm to additional work and costs in the subcontracts.

Within the second sphere of authority at the prime contract level, the ARCS firm must obtain review and approval from the Federal Government, within the context of the ARCS Work Assignment, for any changes in the work. The only person who has authority within the Federal Government to approve changes to the work is the EPA Contracting Officer. Various technical and program staff who act as the Contracting Officer's Technical Representatives (COTRs) provide support for the Contracting Officer's decisions to approve changes.

For each ARCS construction project the Environmental Protection Agency (EPA) will designate an experienced construction COTR who is a licensed professional engineer with substantial construction management experience. This construction COTR will function under the title of Design and Construction Advisor (DCA) and will support the Remedial Project Manager (RPM by providing technical and cost analyses of all changes to the work. The role of the DCA will be discussed in further detail below. The EPA RPM will review changes to insure that the environmental criteria of the remedy are met, and will also administer any impacts on the Work Assignment budget and schedule.

ARCS DESIGN AND CONSTRUCTION ADVISOR (DCA)

The DCA will be the Contracting Officer's construction engineering technical expert and advisor. As such, the DCA will provide to EPA engineering judgments, reviews and advice on technical decisions regarding construction issues including, but not limited to, the review and analysis of changes to the work that may arise in the course of construction. In situations where high costs or complex conditions exist, the DCA will obtain other resources necessary to provide the analysis. The DCA will travel to the site on short notice when construction issues warrant it. In addition, the DCA will attend appropriate milestone events such as the pre-construction conference, and the pre-final and final inspection.

The education and experience of the DCA should be heavily weighted in construction. The individual should be a degreed and registered Professional Engineer since the Government position needs to be based on professional engineering judgments to meet the standards of evidence that is likely to be submitted to an appeals board. Sources of DCAs for ARCS construction projects include:

- EPA REGIONAL SUPERFUND STAFF: If the EPA Regional office has staff with the appropriate qualifications, then these individuals could be assigned as DCAs, taking into consideration that due to the nature of active construction, the DCA duties would sometimes have to take precedence over all other duties.

- U.S. BUREAU OF RECLAMATION: The Bureau of Reclamation has made a commitment to make available construction engineers as DCAs in support of ARCS construction under an Interagency Agreement. Additionally the Bureau has agreed to provide access to their Claims Analysis Section in the Construction Division of the Denver Office. This Section is composed of a staff of 15 with a broad base of construction experience, change order analysis and claim resolution. The Claims Analysis Section will perform analyses of changes, make technical presentations and assist in the preparation of negotiating positions.

- ALTERNATE A&E FIRMS: An independent A&E firm, e.g. an ARCS firm with construction management experience which is not involved with the design or construction work assignment, REM 5 or REM 6 could provide DCA services for a, specific site or across several sites. This approach will be further evaluated through pilots during FY 90.

TECHNICAL AND COST ANALYSIS OF PROPOSED CHANGES

Changes will be subject to technical and cost analyses at both the ARCS subcontract level and within the context of the Work Assignment at the prime contract level. A discussion of these functions at each level follows:

1. ARCS TECHNICAL AND COST ANALYSIS: Changes in construction work will be subject to an internal ARCS analysis. In simple, low-cost changes, the analysis may merely involve review of the engineering estimate and the definition of the work which was developed by the ARCS Construction Management Team.

For higher cost, more complex changes, the ARCS firm may use additional technical review and design engineers to analyze the proposed changed work during the development of the engineering estimate and definition of the work. These individuals may help develop and coordinate the negotiating position of the ARCS Construction Management Team. These activities will be accomplished in parallel with an analysis of the proposed change by EPA within the context of the Work Assignment at the prime contract level.

2. EPA TECHNICAL AND COST ANALYSIS: All changed work must be analyzed for approval by the EPA Contracting Officer. The Contracting Officer will rely on the RPM and the Design and Construction Advisor to provide these analyses. In the case of routine, low-cost changes, the analysis will be in the form of a quick turn-around review and approval of the change as negotiated by the ARCS firm with the Constructor. This will occur at Step 9, as described in the Construction Contract Modification Approval Procedures section.

For higher cost, more complex changes, the RPM will task the Design and Construction Advisor to initiate an analysis of the changed work and develop an Independent Government Estimate in parallel with the ARCS firm's actions to define and specify the work in preparation for negotiations. This process would be initiated at Step 5 of the Construction Contract Modification Approval Procedures section. The Design and Construction Advisor will utilize whatever resources are necessary to accomplish the analysis. If the changed work is of sufficient cost or complexity to warrant an in-depth analysis, then the Design and Construction Advisor may submit the change to the Claims Analysis Section of the Bureau of Reclamation Construction Division Office in Denver, Colorado.

WORK ASSIGNMENT MANAGEMENT AND ENVIRONMENTAL REVIEW

Within ARCS construction projects, all changes will be reviewed by the RPM to insure that the environmental criteria of the Remedial Action are maintained. These changes will also be reviewed for impacts on the Work Assignment budget and schedule.

When high cost changes occur that exceed the amount of funds in the Reserve Fund, then the Remedial Project Officer will revise the Work Assignment and arrange for the obligation of the additional funds necessary to pay for the change and replenish the Reserve Fund if necessary.

RESERVE FUNDS

When an ARCS construction contract is executed, EPA will adjust the Work Assignment funds to provide a Reserve Fund that equals 15% of the contracted price for the work. These Reserve Funds are set aside exclusively to cover the costs of changes to work under conditions discussed in this document and in accordance with the Changes clauses of the subcontract.

The approval to use Reserve Funds will be given to the ARCS firm by way of a Work Assignment Form which increases the expenditure limit. For situations that require immediate action, verbal approval to draw $25,000 or less will be given to the ARCS Construction Management Team by the EPA Contracting Officer or representative with the understanding that the appropriate paperwork will follow as soon as possible.

CHANGE ACTIVITIES

Exhibit 1 represents the activities that take place between a Construction Management Team and a Construct or when change is made in a construction contract. These activities begin with the identification and appraisal of the change, including a decision as to whether or not immediate action is required. The change is then defined by way of an engineering design. A proposal is the basis of negotiations to reach a final price and schedule for the work, and the Contract Modification is issued. For a small change, such as clearing and grubbing a small piece of land, all the activities could take place in a matter of hours. Very large, complex changes could require days or weeks to process because they require a greater effort to define and negotiate.

In all changes the same fundamental actions take place as shown in the chart. The ARCS Contract Modification Procedures described below is designed to tap into these actions at the appropriate times to provide Government oversight, approval and funding.

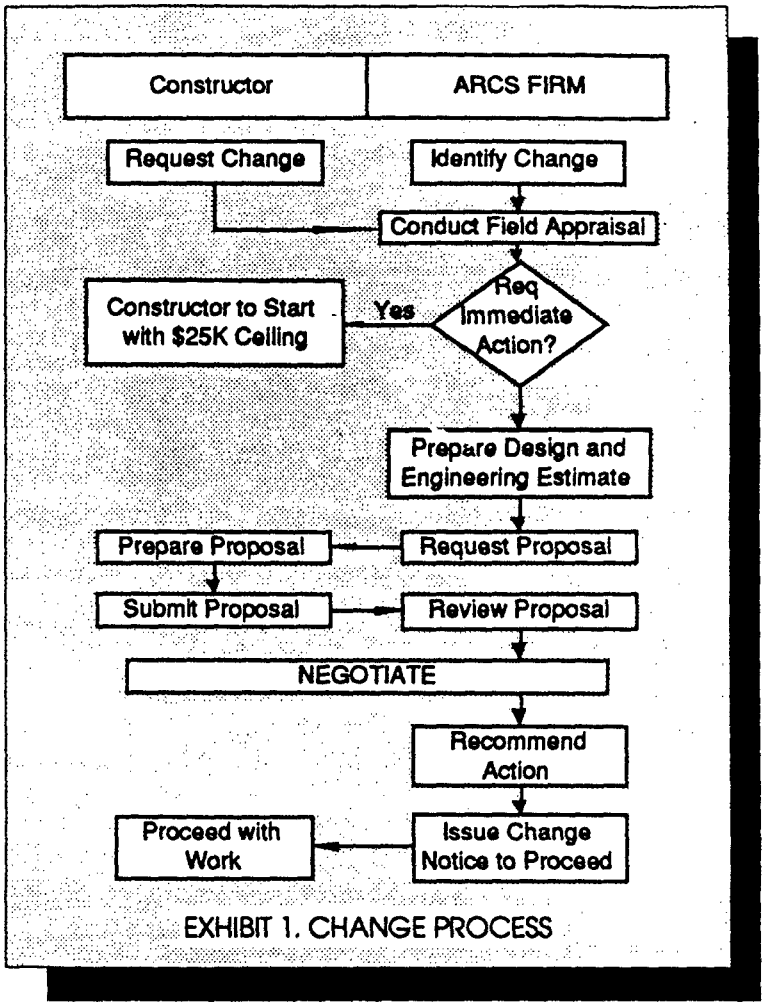


EXHIBIT 1. CHANGE PROCESS

CONSTRUCTION CONTRACT MODIFICATION APPROVAL PROCEDURES

The procedure is an expansion of the process shown in Exhibit 1 and includes the approvals necessary to insure the appropriate management of changes and to provide an adequate amount of control to EPA in the funding and execution of changes in the work. Ten steps in the procedure are shown in the flow chart in Exhibit 2 and are described below.

***1. REQUEST OR IDENTIFICATION OF REQUIRED CHANGE*:** A recognition of the need for a change can originate with either the Constructor or the Construction Management Team's representative, usually the Resident Engineer. The Constructor may encounter conditions at the site which will require a change or the Resident Engineer, through normal tracking of the construction tasks, may observe conditions that may warrant a change in the work. At this stage the Resident Engineer will inspect the field conditions or other circumstances that have been identified as a potential change to the work.

2. FIELD APPRAISAL: In the second step the Resident Engineer develops a Field Appraisal of the scope and cost of the potential change. For small changes this might be a simple engineering judgment. For larger changes it would, at most, entail an informal estimate of the adjustments that would be required with regard to cost and schedule.

3. SCOPE DETERMINATION: This step actually occurs concurrently with the initial observation and appraisal of the potential change. The Resident Engineer evaluates the change with regard to the scope of the project. If the change is out cf scope, then it would be directed to the RPM as a basis of a possible new or revised Work Assignment, but it would not be accomplished under the current contract.

4. IMMEDIATE ACTION DETERMINATION: For changes that require immediate action, the ARCS Construction Management Team will be permitted by verbal approval, or through a prearranged notification procedure with the EPA Contracting Officer, to draw increments of up to $25,000 from the Reserve Fund with which to initiate the work. The Constructor will then be ordered to proceed with actions that are needed on an immediate basis. While the work is progressing, the standard contract modification process will be carried forward in the normal manner. If the Constructor expends the initial $25,000 on a large change order before the total change is defined and negotiated, then subsequent increments of funds can be requested for circumstances that require the actions to continue.

5. INDEPENDENT GOVERNMENT ESTIMATE: Changes that are expected to cost less than $25,000 will not require an Independent Government Estimate. These changes will be reviewed and concurred with by the Contracting Officer with the support of the RPM and DCA after a price has been negotiated with the Constructor. This will occur at step 9 and will result in the issue of a Work Assignment Form permitting the ARCS Construction Management Team to draw down the Reserve Fund to pay for the work. The ARCS management of these small changes will be evaluated as part of the performance evaluation for award fee and for the assignment of future work.

Changes that will cost more than $25,000 will require an Independent Government Estimate. The Contracting Officer will rely on Design and Construction Advisor to either develop the estimate independently, or, if the change is large enough, to submit it to the Bureau of Reclamation Claims Analysis Section for analysis. The results of the analysis will be submitted to the EPA Contracting Officer. This Independent Government Estimate will serve as the basis for negotiations between EPA and the ARCS firm for the revision of the work assignment cost and schedule to accomodate the changed work.

6. ARCS ENGINEERING ESTIMATE: For changes estimated to be under $25,000, an ARCS engineering design and estimate of the work will be the sole basis for requesting and negotiating a proposal for the work from the constructor.

For changes estimated to cost over $25,000, the ARCS engineering design and estimate will be developed in parallel with the Independent Government Estimate. Differences between the ARCS estimate and the Government estimate will be negotiated between the ARCS firm and EPA. These negotiations should be completed before a final price is negotiated by the ARCS firm with the constructor.

7. REQUEST AND REVIEW OF PROPOSAL: The next step is for the Construction Management Team to submit the design to the Constructor to request a proposal for the work. The Constructor then prepares and submits his own proposal and estimate for the work for a pre-negotiation review.

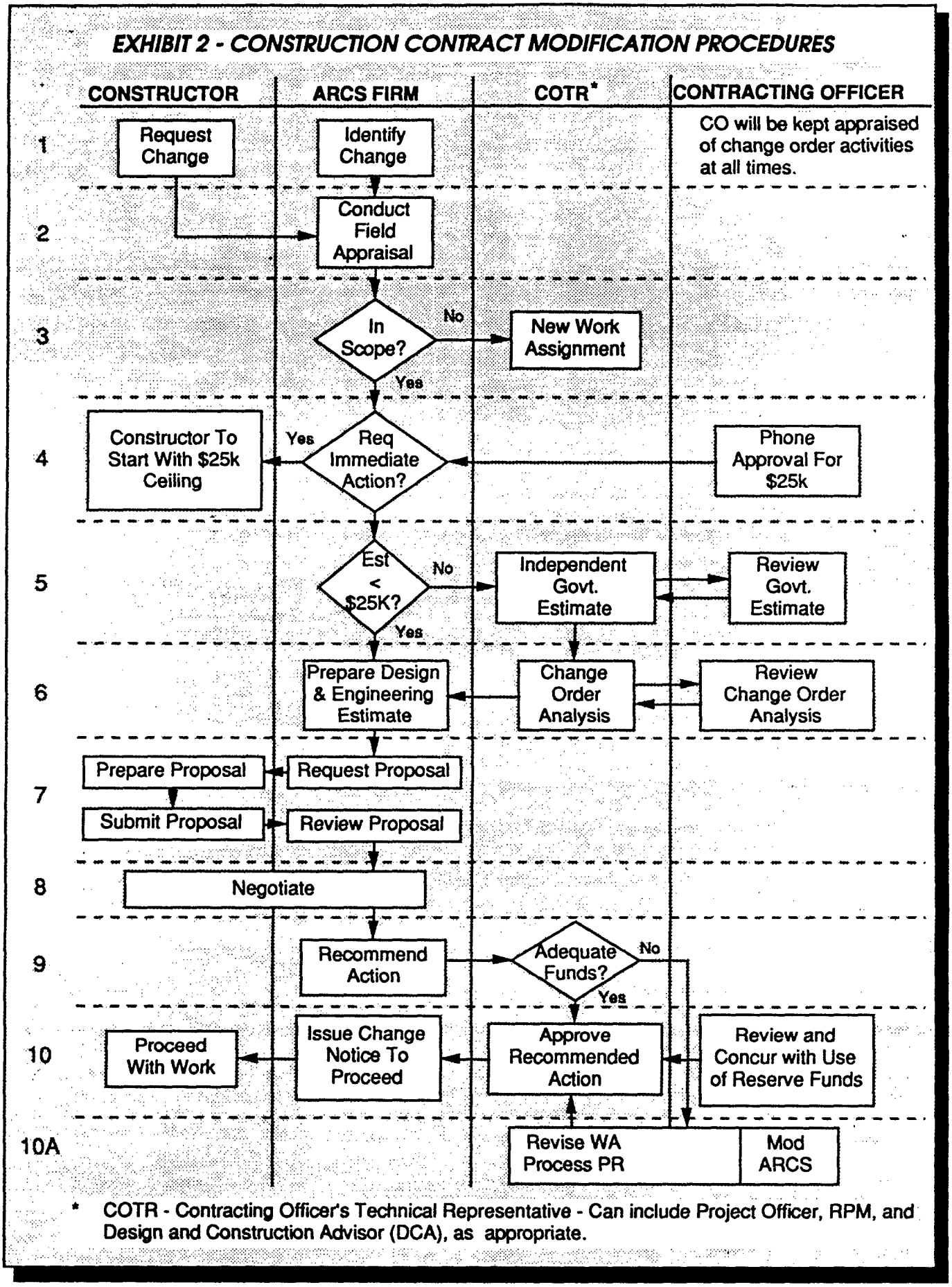
8. NEGOTIATIONS: It is during this Step that the Construction Management Team attempts to negotiate an acceptable price and an equitable adjustment to the project schedule to accommodate the changed work. When agreement is reached, the ARCS firm will prepare the modification to the subcontract. This would be in the form of a supplemental agreement which will be signed by both a representative of the ARCS firm and the Constructor for concurrence by the EPA Contracting Officer with the support of the RPM and DCA.

If agreement is not reached, the the ARCS firm will prepare a Change Order (unilateral modification) which would be in the same format of a supplemental agreement but would not require the signature of the Constructor. The Constructor would be directed to accomplish the work at the schedule and cost determined by the ARCS firm. The unresolved price and schedule would become the subject of a Claim to the ARCS firm if the Constructor wished to pursue the matter further.

9. ACTION RECOMMENDATION: At the end of the negotiation period, the Supplemental Agreement or Change Order is submitted to the Contracting Officer through the RPM for concurrence and verification of funding to cover the agreed to price.

10. APPROVAL AND MODIFICATION OF CONSTRUCTION CONTRACTS: The Contracting Officer reviews and concurs. If there are adequate funds in the Reserve Fund, the RPM will issue a Work Assignment Form permitting the ARCS firm to draw down the Reserve Fund and issue the change to the subcontract.

EXHIBIT 2 - CONSTRUCTION CONTRACT MODIFICATION PROCEDURES



* COTR - Contracting Officer's Technical Representative - Can include Project Officer, RPM, and Design and Construction Advisor (DCA), as appropriate.

APPENDIX D

LEVEL OF EFFORT (LOE) ESTIMATING TABLES AND RD COST ESTIMATING FORMS*

*These tables and forms are divided into the 11 standard tasks for the ARCS (Alternative Remedial Contracting Strategy) contracts, but they can also be used in estimating LOE and cost of the 13 standard tasks for RACS (Response Action Contracts) remedial design work assignments.

Table D.1: LOE Summary
Ground-Water Treatment — Complex

Standard Task	Description	LOE (hours)		ODCs					Subcontractors						
		Low	High	Travel	Reports	Computer	Communication	Equipment	Drilling	Surveying	Analyt. Lab	Treatability	GeoTech. Lab	Waste Dsp. Svc.
1	Project Planning	712	1,196	●	●		●							
2	Community Relations	250	348	●	●		●	●						
3	Data Acquisition	465	585	●		●	●	●	●	●				●
4	Sample Analysis and Validation	945	1,137		●	●	●	●			●			
5	Data Evaluation	240	290		●		●							
6	Treatability Study and/or Pilot Tests	464	652	●	●		●	●				●		
7	Preliminary Design	608	736		●	●	●							
8	Equipment and Services Procurement	124	157				●	●						●
9	Intermediate Design	1,708	2,036		●	●	●							
10	Prefinal and Final Design	2,116	2,552		●	●	●							
11	Postremedial Design Support	1,118	1,411	●	●		●							
Total LOE hours		8,750	11,149											

Table D.2: LOE Summary
Ground-Water Treatment — Simple

Standard Task	Description	LOE (hours)		ODCs					Subcontractors						
		Low	High	Travel	Reports	Computer	Communication	Equipment	Drilling	Surveying	Analyt. Lab	Treatability	GeoTech. Lab	Waste Dsp. Svc.
1	Project Planning	592	1,006	●	●		●							
2	Community Relations	234	330	●	●		●	●						
3	Data Acquisition	163	208	●		●	●	●	●	●				●
4	Sample Analysis and Validation	329	416		●	●	●	●			●			
5	Data Evaluation	100	120		●		●							
6	Treatability Study and/or Pilot Tests	172	252	●	●		●	●				●		
7	Preliminary Design	202	256		●	●	●							
8	Equipment and Services Procurement	67	86				●	●						●
9	Intermediate Design	30	40		●		●							
10	Prefinal and Final Design	872	1,204		●	●	●							
11	Postremedial Design Support	607	773	●	●		●							
Total LOE hours		3,368	4,691											

Table D.3: LOE Summary
Ground-Water Treatment — Simple (Expedited)

Standard Task	Description	LOE (hours)		ODCs					Subcontractors					
		Low	High	Travel	Reports	Computer	Communication	Equipment	Drilling	Surveying	Analyt. Lab	Treatability	GeoTech. Lab	Waste Dsp. Svc.
1	Project Planning	226	395	●	●		●							
2	Community Relations	167	240	●	●		●	●						
3	Data Acquisition	0	0											
4	Sample Analysis and Validation	0	0											
5	Data Evaluation	0	0											
6	Treatability Study and/or Pilot Tests	0	0											
7	Preliminary Design	456	560		●	●	●							
8	Equipment and Services Procurement	40	54				●	●						
9	Intermediate Design	0	0											
10	Prefinal and Final Design	392	490		●	●	●							
11	Postremedial Design Support	360	486	●	●		●							
Total LOE hours		1,641	2,225											

Table D.4: LOE Summary
Treatment of Soils and Sludge — Complex

Standard Task	Description	LOE (hours)		ODCs					Subcontractors						
		Low	High	Travel	Reports	Computer	Communication	Equipment	Drilling	Surveying	Analyt. Lab	Treatability	GeoTech. Lab	Waste Dsp. Svc.
1	Project Planning	712	1,196	●	●		●							
2	Community Relations	250	348	●	●		●	●						
3	Data Acquisition	420	528	●		●	●	●	●	●				●
4	Sample Analysis and Validation	840	1,056		●	●	●	●			●		●	
5	Data Evaluation	300	360		●		●							
6	Treatability Study and/or Pilot Tests	404	560	●	●		●	●				●		
7	Preliminary Design	1,008	1,216		●	●	●							
8	Equipment and Services Procurement	144	181				●	●						●
9	Intermediate Design	2,408	2,876		●	●	●							
10	Prefinal and Final Design	3,066	3,512		●	●	●							
11	Postremedial Design Support	1,298	1,626	●	●		●							
Total LOE hours		10,850	13,463											

Table D.5: LOE Summary
Treatment of Soils and Sludge — Simple

Standard Task	Description	LOE (hours)		ODCs					Subcontractors					
		Low	High	Travel	Reports	Computer	Communication	Equipment	Drilling	Surveying	Analyt. Lab	Treatability	GeoTech. Lab	Waste Dsp. Svc.
1	Project Planning	592	1,006	●	●		●							
2	Community Relations	234	330	●	●		●	●						
3	Data Acquisition	237	300	●		●	●	●	●	●				●
4	Sample Analysis and Validation	473	599		●	●	●	●						
5	Data Evaluation	176	212		●		●				●			
6	Treatability Study and/or Pilot Tests	200	276	●	●		●	●				●		
7	Preliminary Design	320	394		●	●	●							
8	Equipment and Services Procurement	88	110				●	●						●
9	Intermediate Design	30	40		●		●							
10	Prefinal and Final Design	1,262	1,600		●	●	●							
11	Postremedial Design Support	794	993	●	●		●							
Total LOE hours		4,406	5,860											

Table D.6: LOE Summary
Civil Engineering — Complex

Standard Task	Description	LOE (hours)		ODCs					Subcontractors						
		Low	High	Travel	Reports	Computer	Communication	Equipment	Drilling	Surveying	Analyt. Lab	Treatability	GeoTech. Lab	Waste Dsp. Svc.
1	Project Planning	712	1,196	●	●		●							
2	Community Relations	250	348	●	●		●	●						
3	Data Acquisition	415	528	●		●	●	●	●	●				●
4	Sample Analysis and Validation	829	1,056		●	●	●	●			●		●	
5	Data Evaluation	300	360		●		●							
6	Treatability Study and/or Pilot Tests	0	0											
7	Preliminary Design	1,028	1,240		●	●	●							
8	Equipment and Services Procurement	153	192				●	●						●
9	Intermediate Design	2,518	3,026		●	●	●							
10	Prefinal and Final Design	3,136	3,934		●	●	●							
11	Postremedial Design Support	1,379	1,725	●	●		●							
Total LOE hours		10,720	13,605											

Table D.7: LOE Summary
Civil Engineering — Simple

Standard Task	Description	LOE (hours)		ODCs					Subcontractors					
		Low	High	Travel	Reports	Computer	Communication	Equipment	Drilling	Surveying	Analyt. Lab	Treatability	GeoTech. Lab	Waste Dsp. Svc.
1	Project Planning	592	1,006	●	●		●							
2	Community Relations	234	330	●	●		●	●						
3	Data Acquisition	195	238	●		●	●	●	●	●				●
4	Sample Analysis and Validation	390	476		●	●	●	●			●			
5	Data Evaluation	60	72		●		●							
6	Treatability Study and/or Pilot Tests	0	0											
7	Preliminary Design	218	268		●	●	●							
8	Equipment and Services Procurement	53	68				●	●						●
9	Intermediate Design	40	48		●	●	●							
10	Prefinal and Final Design	851	1,070		●	●	●							
11	Postremedial Design Support	473	611	●	●		●							
Total LOE hours		3,106	4,187											

Table D.8: LOE Summary
Civil Engineering — Simple (Expedited)

Standard Task	Description	LOE (hours)		ODCs					Subcontractors						
		Low	High	Travel	Reports	Computer	Communication	Equipment	Drilling	Surveying	Analyt. Lab	Treatability	GeoTech. Lab	Waste Dsp. Svc.
1	Project Planning	198	360	●	●		●							
2	Community Relations	167	240		●		●	●						
3	Data Acquisition	0	0											
4	Sample Analysis and Validation	0	0											
5	Data Evaluation	0	0											
6	Treatability Study and/or Pilot Tests	0	0											
7	Preliminary Design	520	632		●	●	●							
8	Equipment and Services Procurement	38	51				●	●						
9	Intermediate Design	8	16		●		●							
10	Prefinal and Final Design	366	454		●	●	●							
11	Postremedial Design Support	344	457	●	●		●							
Total LOE hours		1,633	2,210											

Table D.9: LOE Summary
On-Site Thermal Destruction

Standard Task	Description	LOE (hours)		ODCs					Subcontractors					
		Low	High	Travel	Reports	Computer	Communication	Equipment	Drilling	Surveying	Analyt. Lab	Treatability	GeoTech. Lab	Waste Dsp. Svc.
1	Project Planning	712	1,196	●	●		●							
2	Community Relations	200	258	●	●		●	●						
3	Data Acquisition	237	300	●		●	●		●	●				●
4	Sample Analysis and Validation	473	599		●	●	●				●			
5	Data Evaluation	344	413		●		●	●						
6	Treatability Study and/or Pilot Tests	660	898	●	●		●	●				●		
7	Preliminary Design	1,038	1,256		●	●	●							
8	Equipment and Services Procurement	150	188				●	●						●
9	Intermediate Design	2,183	2,606		●	●	●							
10	Prefinal and Final Design	2,066	3,536		●	●	●							
11	Postremedial Design Support	1,348	1,689	●	●		●							
Total LOE hours		9,411	12,939											

OTHER DIRECT COSTS AND SUBCONTRACTOR DESCRIPTIONS
(to be used as supplement to Tables D.1—D.9)

Other Direct Costs

- TRAVEL: Includes all transportation and living expenses.
- COMPUTER: Includes cost for direct CPU hook-up time.
- REPORTS: Includes copying, word processing, graphics, and report production costs.
- COMMUNICATIONS: Includes telephone, telecopying, overnight delivery service, courier, postage, and shipping.
- EQUIPMENT: Includes purchase or rental of field support equipment and supplies, health and safety equipment, and personal protective equipment.

Subcontractors

- DRILLING: Sample collection, trenching, test pit excavation, well installation, pumping tests, geophysics, etc.
- SURVEYING: Engineering surveying to support the field data collection and design activities.
- ANALYTICAL LABORATORY: Services to confirm contaminant location and concentration.
- TREATABILITY: Subcontractor(s) selected to perform bench- and/or pilot-scale studies to confirm efficiency of selected technology and supply design parameters.
- GEOTECHNICAL LABORATORY: Conduct analyses to develop design criteria for foundation loading, soils slopes, acceptability of borrowed materials, etc.
- WASTE DISPOSAL SERVICE: Remove waste generated during field data collection and treatability activities to a licensed facility.

Independent Cost Estimate
Summary Sheet

Name of Contractor			
Site			
Location		**Contract No.**	
Prepared By		**Date**	
Estimated Total RD Labor Hours (From Page D-13)	**Estimate of Hours (P1–P4)**	**Average Hourly Rate***	**Direct Cost (in dollars)**
Other Direct Costs (From Page D-14)			**$**
Subcontractor Costs (From Page D-16)			**$**
Total Costs			**$**

***Use a "loaded" average hourly rate that includes overhead and G&A Expenses.**

Estimate of RD Labor Hours

Site						
Task	Description	Labor Hours				Total Hours
		P1	P2	P3	P4	
Task 1	Project Planning and Support					
Task 2	Community Involvement					
Task 3	Data Acquisition					
Task 4	Sample Analysis					
Task 5	Analytical Support and Data Validation					
Task 6	Data Evaluation					
Task 7	Treatability Study/Pilot					
Task 8	Preliminary Design					
Task 9	Equipment/Services/Utilities					
Task 10	Intermediate Design					
Task 11	Prefinal/Final Design					
Task 12	Post-Remedial Design Support					
Task 13	Work Assignment Closeout					
	Total (Labor Hours)					

Remarks:

Other Direct Costs (ODCs) Estimating Form

Site

Item	No. of Units		Unit Cost	Estimated Cost
Reproduction	_____	X	_____	_____
Mail/Courier	_____	X	_____	_____
Computer Time				_____
Telephone				_____
Reports	_____	X	_____	_____
Supplies/Equipment				
Travel and Per Diem (From Page D-15)				
Total Other Direct Costs				
Notes				

Travel and Per Diem Cost Estimating Form

Site

Item	No. of Units		Unit Cost	Estimated Cost
Air Transporation (Routes):		Unit		
a. _____	_____	Trips @	$_____	$_____
b. _____	_____		_____	_____
c. _____	_____		_____	_____
d. _____	_____		_____	_____
Auto Rental (Locations):				
a. _____	_____	Days @	_____	_____
b. _____	_____		_____	_____
c. _____	_____		_____	_____
d. _____	_____		_____	_____
Per Diem				
a. _____	_____	Days @	_____	_____
b. _____	_____		_____	_____
c. _____	_____		_____	_____
Other:				
_____	_____		_____	_____
_____	_____		_____	_____
Total Travel and Per Diem				$

Subcontract Estimating Form

Site	
Subcontract	**Estimated Cost, Including Overhead and Profit**
Drilling	$_____
Surveying	_____
Analytical Laboratory	_____
Treatability Study	_____
Geotechnical Laboratory	_____
Waste Disposal Service	_____
	_____
	_____
	_____
Total Subcontractor Cost	$_____

Design Cost Limitation Check

Note: **The total estimated design cost SHOULD NOT EXCEED 6 percent of the construction cost of the project. [Ref. FAR at 48CRF 15.903(d)(1)(ii)]**

Site				Current Estimated Cost of Construction
	Cost Breakdown			
Design	Task No.	Labor Hours (P1 Through P4)	Loaded Average Hourly Rate	Total Estimated Design Cost
Preliminary Design	3.8*			$_____
Intermediate Design	3.10**			_____
Prefinal and Final Design	3.11***			_____
				_____
				_____
				_____
				_____
				_____
				_____
				_____

* Less items 3.8.2 through 3.8.6, inclusive
** Less items 3.10.6 through 3.10.9, inclusive
*** Less items 3.11.6 through 3.11.10, inclusive

Total $_____

$$\text{Percent of Construction Cost} = \frac{\text{Total Estimated Design Cost}}{\text{Current Construction Cost Estimate}} \times 100 = \_\_\_\_\_ \%$$

APPENDIX E

MODEL STATEMENT OF WORK FOR REMEDIAL DESIGN OVERSIGHT

_____
(date)

APPENDIX E

6. MODEL STATEMENT OF WORK FOR REMEDIAL DESIGN OVERSIGHT _____ SITE, _____COUNTY, _____STATE

Points for the WAM/RPM to consider in preparing the Statement of Work for Remedial Design Oversight:

The purpose of this Statement of Work is twofold:

1. **To tell the contractor what you want done.** Be as specific as possible in describing what you want the contractor to do. In that way, the contractor will understand your requirements, will write a work plan and budget describing how and at what cost he or she plans to meet those requirements, and ultimately will be responsible for performing to those requirements. Whenever you have an absolute requirement (e.g., that the contractor prepare the QAPP in accordance with QAMS-005/80, December 29, 1980), it is best to state it. Add the attachments to the SOW: (1) Summary of Major Submittals for the Remedial Design at _____(Site), (2) Work Breakdown Structure, and (3) Transmittal of Documents for Acceptance by EPA.

2. **To give the contractor a work breakdown structure for recording cost.** In this manner, work plan cost and final costs of different RD oversight projects can be compared and analyzed.

Use of a Work Breakdown Structure (WBS)

1. A WBS has been developed for this model work assignment in order for EPA to track the initial and final costs of each element used for preparing future cost estimates. The WBS is, essentially, the outline for this work assignment and is included as Attachment 2 to this SOW.

2. If an element is not to be used, do not change the numbering system; instead, insert "not used" or "N/A" after the element number after deleting the text for that element.

3. For the items used for a given project, additional descriptions (e.g., type of samples and estimated number) should be added in order for the contractor and RPM/WAM to develop estimated costs on a common basis.

6.0 Introduction

.0.1 Site Description

Provide a brief site description that contains information relative to RD oversight planning and implementation such as location, operational history, remedial response history, waste types, quantities, and milestones specified within the ROD.

.0.2 Purpose

The purpose of this work assignment is to obtain contractor support for the oversight of the remedial design (RD) at the_____(site). Implementation of the RD shall be performed by the Potentially Responsible Parties (PRPs). The estimated completion date for this work assignment is_____.

.0.2.1 Description of the RD

Describe the specific RD for which oversight is required. Provide a summary of the general response objectives, description of the remedy, and expected period of performance of the RD.

.0.2.2 Objectives of Oversight. The primary objective of PRP oversight is to ensure that the remedies specified in the RD and used in the remedial action (RA) protect public health and the environment during the life of the project and are implemented in compliance with the terms of the Settlement Agreement. Oversight meets its objectives by observing and documenting that the PRP has complied with all applicable laws, regulations, and requirements, and has met all performance standards specified in the Settlement Agreement.

.0.3 General Requirements

.0.3.1 The contractor shall conduct the RD Oversight in accordance with this Statement of Work (SOW) and to ensure consistency with the ROD issued on_____(date), the Consent Decree, *the Remedial Design and Remedial Action Handbook (DRAF7)* (U.S. EPA Office of Solid Waste and Emergency Response Directive, August 1993) and all other guidance used by EPA in conducting an RD/RA. See references listed in Attachment 5.

.0.3.2 A summary of the major deliverables and the schedule for submittal is attached. See Attachment 1. The contractor shall submit the major deliverables using the form Transmittal of Documents for Acceptance by EPA, Attachment_____.

This attachments to this model SOW may be copied and completed for a given RD. Attachment 4 is a form for use by the contractor in the transmittal of documents to EPA. Attachment 5 is a transmittal register log for use by the WAM/RPM in tracking documents submitted by the contractor.

.0.3.3 Specifically, the RD involves the design of_____
_____.

.0.3.4 The contractor shall furnish all necessary and appropriate personnel, materials, and services needed, or incidental to, performing and completing the RD oversight.

.0.3.5 A list of primary guidance and reference material is attached. See Attachment 2. In all cases, the contractor shall use the most recently issued guidance.

.0.3.6 The contractor shall maintain oversight files as specified in the contract and by the Work Assignment Manager or Remedial Project Manager (WAM/RPM). The WAM/RPM may periodically audit the site files and record-keeping procedures.

.0.3.7 The contractor shall communicate at least weekly with the WAM/RPM, either in person or through conference calling, to report on oversight progress.

.0.3.8 The contractor shall notify the WAM/RPM when 75 percent and when 95 percent of the approved work assignment budget has been expended.

.0.3.9 The contractor shall document all decisions that are made in meetings and conversations with EPA or the PRP. The contractor shall forward this documentation to the WAM/RPM within 2 working days of the meeting or conversation.

It still remains the WAM's responsibility to fully document all decisions made. The contractors's documentation is to be used for confirmation only.

.0.3.10 EPA will provide oversight of contractor activities throughout the RD oversight efforts. EPA review and approval of the contractor's deliverables is a tool to assist this process and to satisfy, in part, EPA's responsibility to provide effective protection of public health, welfare, and the environment during the Contractor' oversight of the PRP's remedial activities. EPA will review the deliverables prepared during the oversight to assess the likelihood that the RD will achieve its remediation goals and that all performance requirements applicable to the_____ _____.

RD have been correctly identified and implemented. However, acceptance of deliverables by EPA does not relieve the contractor of responsibility for the adequacy of the deliverable

.0.4 Oversight Official

The contractor shall designate one or more Oversight Officials to work directly with the WAM/RPM during the RD oversight. The Oversight Official(s) is (are) the individual(s) responsible under this Statement of Work for providing technical support in monitoring PRP compliance with the Settlement Agreement.

.0.5 Equipment Transfer

At the completion of the work assignment, the contractor shall transfer all equipment purchased with contract funds to the EPA Equipment Coordinator in accordance with the contract.

.0.6 Project Closeout

At the completion of the work assignment, the contractor shall perform all necessary project closeout activities as specified in the Contract. These activities may include closing out any subcontracts, indexing and consolidating project records and files as required in 6.0.3.6 above, and providing a technical and financial closeout report to EPA.

The task structure, that follows has been drafted to support the development of a comprehensive RD Oversight SOW to execute a well-defined RD, but can be tailored to support a phased RD SOW to which amendments will be made over the project life cycle as more specific requirements for RD oversight activities are determined.

6.1 Project Planning and Support

.1.1 Project Planning. This task includes efforts related to project initiation.

.1.1.1 Attend Scoping Meeting. The contractor shall attend a scoping meeting to be held at the EPA Regional Office before or concurrent with developing the oversight Work Plan.

Point for the WAM/RPM to consider:

The location of meetings (and approximate number of contractor attendees) should be specified for cost-estimating purposes.

.1.1.2 Conduct Site Visit. The contractor shall conduct a 1-day site visit with the EPA WAM/RPM during the project planning phase to develop a conceptual understanding of the site and the RD scope and requirements. A Health and Safety Plan (HASP) is required for the site visit. The contractor shall prepare a letter report that documents all EPA, contractor, and site personnel present at the visit; all decisions made during the visit; any action items assigned, including person responsible and due date; any unusual occurrences during the visit; and any portions of the site that were not accessible to the contractor and the impact of this on oversight of the remedial design. This report shall be submitted to the EPA WAM/RPM within 10 calendar days of the site visit.

.1.1.3 Evaluate Existing Information. The contractor shall obtain, copy, and review available information pertaining to the site from EPA. The contractor shall evaluate the existing data and documents, including the Record of Decision (ROD), the Consent Decree (CD), the PRP Work Plan for the RD/RA, and other data and documents as directed by EPA. The specific documents to be reviewed are listed in Attachment 3.

Point for the WAM/RPM to consider:

The RPM will create an attachment to this SOW that is a listing of site-specific information that will be of use to the contractor in oversight of the remedial design. (See Chapter 3 of the *Guidance for Scoping the Remedial Design*). To streamline this task and control expenses, limit the review to documents that help the contractor to accurately scope the project and optimize oversight tasking. Specify reports and other documentation that establish the nature and extent of contamination: a summary of risk(s), a list of cleanup targets, and the basis for design. At a minimum, this should include the ROD, the CD, and the PRP Work Plan. Additional documents that may be appropriate include the Remedial Investigation/Feasibility Study (RI/FS), Focused Feasibility Studies (FFS), State documentation, applicable or relevant and appropriate requirements (ARARs), evaluations, hydrogeological information, and other material located in the site file.

.1.1.4 (Not Used)

.1.1.5 Develop RD Oversight Work Plan

(1) Develop Draft Oversight Work Plan. The contractor shall prepare and submit a Draft and Final RD Oversight Work Plan within 45 and 90 calendar days, respectively, after initiation of the work assignment (WA). The contractor shall use information from the EPA-approved PRP Work Plan, appropriate guidance, and direction provided by the EPA WAM/RPM as the basis for preparing the RD Oversight Work Plan. RD oversight work must be coordinated and properly sequenced with EPA and PRP RD activities. Submit the original to the Contracting Otricer (CO) and two copies to the Project Officer (PO).

(a) Develop Narrative. The RD Oversight Work Plan shall include a comprehensive description of project tasks, the procedures to accomplish them, quality assurance/quality control (QA/QC) systems and project-specific QA/QC procedures to be followed, project documentation, and project schedule. Specifically, the Work Plan shall include the following:

- Identification of RD project elements and the associated oversight tasking including review of PRP planning, design, and activity reporting documentation; field sampling and analysis activities, and treatability study activities. Output of this task will be a detailed work breakdown structure of the RD oversight project.

6.1.1.5 *(continued)*

- The contractor's technical and management approach to each task to be performed, including a detailed description of each task; the assumptions used; the identification of any technical uncertainties (with a proposal for the resolution of those uncertainties); the information needed for each task; any information to be produced during and at the conclusion of each task; and a description of the work products that will be submitted to EPA. Information shall be presented in a sequence consistent with the work breakdown structure format defined in the standard WBS. See Attachment ___.
- A schedule with specific dates for the start and completion of each required activity and submission of each deliverable required by this SOW. (See Attachment 1 for format.) This schedule shall also include information regarding timing, initiation, and completion of all critical path milestones for each activity and deliverable and the expected review time for EPA.
- A project communications and management plan, including a data management plan and contractor reporting requirements, such as meetings and presentations to EPA at the conclusion of major phases of the project. The data management plan shall address the requirements for project management systems including tracking, storing, and retrieving data and also shall identify software to be used, minimum data requirements, data format, and backup data management. The plan shall address both data management and document control for all oversight activities conducted during the RD.

Points for the WAM/RPM to consider:

It may be beneficial for the WAM/RPM to consider issuing the RD oversight WA in phases and to modify the SOW for funding as more information is available. This will enable the WAM/RPM to prepare a more detailed and accurate SOW and IGCE for each of the phases tasked.

The oversight contractor may be tasked to conduct oversight activities in the following steps:

1. Review documents, including the PRP Work Plan, to develop the Oversight Work Plan. If the PRP Work Plan is not available, then the WAM/RPM may still want to task the contractor to review background information and to provide general startup support.

2. Develop the Oversight Work Plan.

3. Modify the scope of work for funding to include RA Oversight activities.

(b) Develop Cost Estimate. The contractor's estimated cost to complete the work shall be broken down into the Level of Effort (by P-level) and cost for each element of the Work Breakdown Structure (Attachment 2) and submitted to EPA on disk.

(c) Perform Internal QA and Submit Draft Oversight Work Plan

(2) Prepare Final Oversight Work Plan

(a) Attend Negotiation Meeting. The contractor shall attend a Work Plan negotiation meeting at the Region ___ office. EPA and the Oversight Contractor will refine the SOW requirements and funding issues related to the Oversight Work Plan.

(b) Modify Draft Oversight Work Plan and Cost Estimate

6.1.1.5 *(continued)*

Point for the WAM/RPM to consider:

If the RD project is implemented using a phased approach to develop additional information throughout the RD phase, specify the anticipated number of modifications and, to the extent possible, the scope of the modification(s).

Examples:

1. If the extent of contamination is not fully defined, indicate that the length of field work is not fully delineated and a modification may be required to accommodate this unquantified field element.

2. If treatability testing is ongoing and may significantly affect RD activities, but oversight is required for treatability activities, specify that the RD Oversight Work Plan will be completed in multiple phases.

(c) Perform Internal QA and Submit Final Oversight Work Plan

.1.1.6 Review PRP Plans. The contractor shall review the following PRP-developed work plans for conformance with applicable EPA standards and guidance (see also Task 6.7 for review instructions) and provide written review comments to the WAM/RPM.

(1) Review PRP Site Management Plan
  (a) Review PRP Pollution Control & Mitigation Plan
  (b) Review PRP Transportation and Disposal (of site-derived wastes) Plan
(2) Review PRP Health and Safety Plan
(3) Review PRP Sampling and Analysis Plan (Chemical Data Acquisition Plan)
  (a) Review PRP Quality Assurance Project Plan (QAPP)
  (b) Review PRP Field Sampling Plan (FSP)
  (c) Review PRP Data Management Plan
(4) Review Other PRP Plan(s)

.1.2 Preparation of Site-Specific Plans

.1.2.1 (Not used)

.1.2.2 Develop Health and Safety Plan. Prepare a site-specific HASP that specifies employee training, protective equipment, medical surveillance requirements, standard operating procedures, and a contingency plan in accordance with 29 CFR 1910.120 1(1) and (1)(2). Whenever possible, use the HASP developed for the Remedial Investigation/Feasibility Study (RI/FS) in preparing the HASP for the RD.

Points for the WAM/RPM to consider:

1. The HASP may not constitute an Emergency Response Plan. Site conditions may warrant a separate deliverable.

2. EPA does not *approve* the contractor's HASP, but reviews it to ensure that it is complete and adequately protective.

.1.2.3 Develop Sampling and Analysis Plan (Chemical Data Acquisition Plan). Prepare an FSP that defines the oversight sampling and information-collection methods that shall be used for the project. It shall include sampling objectives; sample locations and frequency; sampling equipment and procedures; sample handling and analysis; and which samples are to be analyzed through the Contract Laboratory Program (CLP), which through other sources, and the justification for those decisions. The FSP shall be written so that a field sampling team unfamiliar with the site would be able to gather the samples and field information required. The FSP developed for the RI/FS should be used whenever possible in preparing the FSP for the RD oversight activities.

Points for the WAM/RPM to consider:

1. Depending on the complexity of the sampling effort needed to support the RD, the FSP and QAPP can be combined into a single Sampling and Analysis Plan (SAP).

2. Minimize FSP preparation costs by requiring the oversight contractor to utilize the RI/FS FSP as a reference during the development of its sampling plan.

(1) Quality Assurance Project Plan. Prepare a QAPP in accordance with QAMS-005/80 (December 29, 1980). The QAPP shall describe the project objectives and organization, functional activities, and QA/QC protocols that shall be used to achieve the desired Data Quality Objectives (DQOs). The DQOs shall, at a minimum, reflect use of analytical methods for identifying contamination and addressing contamination consistent with the levels for remedial action objectives identified in the National Contingency Plan

(2) Field Sampling Plan. The contractor shall prepare an FSP that defines the oversight sampling and information-collection methods that shall be used for the project. It shall include sampling objectives; sample locations and frequency; sampling equipment and procedures; sample handling and analysis; and description of which samples are to be analyzed through the CLP, which through other sources, and the justification for those decisions. The FSP shall be written so that a field sampling team unfamiliar with the site would be able to gather the samples and field information required. The FSP developed for the RI/FS should be used whenever possible in preparing the FSP for the RD/RA Oversight activities.

(3) Data Management Plan

1.2.4 Other Plan(s)

.1.3 Project Management

The contractor shall perform general work assignment management including management and tracking of costs, preparation of Monthly Progress Reports, attendance at project meetings, and preparation and submittal of invoices.

If the contractor finds that the RA being designed differs significantly from the ROD, the construction or implementation is not consistent with the design, requirements delineated within the Consent Decree are not being met, or that there are compliance issues with applicable or relevant and appropriate requirements (ARARs) at any point in the process, the contractor shall notify the WAM/RPM immediately to describe the issue. The contractor shall then recommend technical solutions in a memorandum ASAP.

.1.3.1 Prepare Periodic Status Reports. The contractor shall prepare monthly progress reports.
(1) Document Cost and Performance Status. The contractor shall document the status of each task and report costs and Level of Effort (by P-level) expended to date.
(2) Prepare and Submit Invoices

.1.3.2 Participate in Meetings and Communicate Routinely. The contractor shall attend project meetings, provide documentation of meeting results, and shall contact the WAM/RPM by telephone on a weekly basis to report project status.

.1.3.3 (Not used)

.1.3.4 (Not used)

.1.3.5 (Not used)

.1.3.6 Manage, Track, and Report Equipment Status

.1.3.7 Work Assignment Closeout

.1.4 Subcontract Procurement and Support Activities

.1.4.1 Identify and Procure Subcontractors
(1) (Not used)— Drilling Subcontractor
(2) (Not used)— Surveying Subcontractor
(3) (Not used)— Geophysical Subcontractor
(4) (Not used)— Site Preparation Subcontractor
(5) Analytical Services Subcontractor(s)
(6) (Not used)— Waste Disposal Subcontractor
(7) (Not used)— Treatability Subcontractor(s)
(8) Other(s)

.1.4.2 Develop Subcontractor QA Program

.1.4.3 Perform Subcontract Management

6.2 Community Involvement

This task includes efforts related to the update and implementation of the Community Involvement Plan (CRP) for the site. The contractor shall provide community involvement support to EPA throughout the RD in accordance with *Community Involvement in Superfund–A Handbook*, June 1988. Community involvement shall encompass the following subtasks:

Point for the WAM/RPM to consider. Listed below are a number of possible community involvement activities you may require depending on the specific situation. The WAM/RPM should check on what community involvement activities the PRP is conducting and coordinate to the extent practical, to avoid any duplication of effort.

.2.1 Develop Community Involvement Plan

.2.1.1 Conduct Community Interviews

.2.1.2 Update CRP. The contractor shall update the RI/FS CRP to address community involvement requirements during the RD.

(1) Draft CRP

(2) Final CRP

.2.2 Prepare Fact Sheets

The contractor shall prepare a fact sheet to inform the public about activities related to the final design, a schedule for the RD and later for the RA, activities to be expected during construction, provisions for responding to emergency releases and spills, and any potential inconveniences such as excess traffic and noise that may affect the community during onsite activities.

.2.3 Public Hearing, Meetings, and Availability Support

The contractor shall prepare presentation materials and provide support as needed for public meetings. The contractor shall assist in communication and coordination with local agencies. The contractor shall attend citizen advisory group meetings

Point for the WAM/RPM to consider:

The number and location of anticipated public meetings should be identified in the SOW for cost estimating purposes.

2.3.1 Technical Support. The contractor shall prepare technical input to news releases, briefing materials, and other community involvement vehicles.

.2.3.2 Logistical and Presentation Support

.2.3.3 Writing and Placement of Public Notice Support

.2.4 Maintain Information Repository/Mailing List

The contractor shall maintain a repository of information on activities related to the RD as described in Appendix A.8, page A-19, of *Community Involvement in Superfund–A Handbook*, June 1988. The contractor shall also maintain and update mailing lists to ensure that all companies, persons, and/or agencies are notified of site activities and scheduled public meetings as required.

Points for the WAM/RPM to consider:

You should specify the format for submissions if you have or your Region has specific requirements.

6.3 Data Acquisition Oversight

This task involves oversight of work efforts related to sampling during both RD and RA. The purpose of the sampling is to compare results with PRP data. The planning for this task is accomplished in Task 6.1, Project Planning, whereby all of the necessary plans required to collect the field data are determined and arranged. This task begins with EPA's approval of the FSP prior to RD and ends with the demobilization of field personnel and equipment from the site after RA is complete.

The contractor shall perform the following field activities or a combination of activities for the data acquisition effort in accordance with the EPA-approved FSP and QAPP developed in Task 6.1:

Point for the WAM/RPM to consider: Before beginning field activities, consider specifying a kickoff meeting with all principal personnel to clarify objectives and communication channels to ensure the efficient use of available funds.

.3.1 Mobilization and Demobilization Oversight

The contractor shall oversee procurement of the necessary personnel, equipment, and materials for efficient mobilization and demobilization to and from the site.

- .3.1.1 (Not used)
- .3.1.2 Mobilization Oversight
  - (1) (Not used)
  - (2) Installation of Utilities
  - (3) Construction of Temporary Facilities
    - (a) Construct Decontamination Facilities
    - (b) Construct Sample or Derived Waste Storage Facility
    - (c) Construct Field Offices
    - (d) Construct Mobile Laboratory
    - (e) Construct Other Temporary Facilities
- .3.1.3 Demobilization Oversight
  - (1) Removal of Temporary Facilities
  - (2) Site Restoration

.3.2 Perform Field Investigation Oversight

The contractor shall collect a percentage of split samples for analysis during RD. Split sampling during RD is required for comparison with the remediation contractor's data.

Points for the WAM/RPM to consider: Specify the expected written and/or photographic documentation to be recorded in the field. Also specify the type of field activity reports expected by the RPM, the frequency, and the required distribution (RPM, State representative, etc.).

Ensure the proper management of samples by the PRP, including accurate chain-of-custody procedures for sample tracking, protective sample-packing techniques, and proper sample-preservation techniques. Ensure that the PRP characterizes and disposes of investigation-derived wastes in accordance with local, State and

6.3.2 (*continued*)

Federal regulations as specified in the FSP (see the Fact Sheet *Guide to Management of Investigation-Derived Wastes*, 9345.3-03FS, January 1992).

.3.2.1 Perform Site Reconnaissance Oversight
- (1) Ecological Resources Reconnaissance
- (2) Well Inventory
- (3) Residential Well Sampling
- (4) Land Survey
- (5) Topographic Mapping
- (6) Field Screening

.3.2.2 Perform Geological Investigations Oversight (Soils and Sediments)
.3.2.3 Perform Air Investigations Oversight
.3.2.4 Perform Hydrogeological Investigations Oversight-Ground Water
- (1) Well Systems Installation
- (2) Sample Collection
- (3) Samples collected during drilling (e.g., hydro punch or equivalent)
- (4) Tidal Influence Study
- (5) Hydraulic Tests (Pump Tests)
- (6) Ground-Water Elevation Measurement

.3.2.5 Perform Hydrogeological Investigations Oversight-Surface Water
.3.2.6 Perform Waste Investigation Oversight
.3.2.7 Perform Geophysical Investigation Oversight
.3.2.8 Perform Ecological Investigation Oversight
.3.2.9 Perform Contaminated Building Samples Oversight
.3.2.10 Perform Disposal of Investigation-Derived Waste Oversight
.3.2.11 Perform Prepare Data Acquisition Oversight Reports

6.4 Analysis of Split Samples

.4.1 Perform Screening-Type Laboratory Sample Analysis

.4.1.1 Analyze Air and Gas Samples
- (1) Organic
- (2) Inorganic
- (3) Radiochemistry

.4.1.2 Analyze Ground-Water Samples
- (1) Organic
- (2) Inorganic
- (3) Radiochemistry

.4.1.3 Analyze Surface-Water Samples
- (1) Organic
- (2) Inorganic
- (3) Radiochemistry

.4.1.4 Analyze Soil and Sediment Samples
- (1) Organic

6.4.1.4 (*continued*)

(2) Inorganic
(3) Radiochemistry

.4.1.5 Analyze Waste (Gas) Samples
(1) Organic
(2) Inorganic
(3) Radiochemistry

.4.1.6 Analyze Waste (Liquid) Samples
(1) Organic
(2) Inorganic
(3) Radiochemistry

.4.1.7 Analyze Waste (Solid) Samples
(1) Organic
(2) Inorganic
(3) Radiochemistry

.4.1.8 Analyze Biota Samples
(1) Organic
(2) Inorganic
(3) Radiochemistry

.4.1.9 Analyze Bioassay Samples

.4.1.10 Perform Bioaccumulation Studies

.4.2 CLP-Type Laboratory Sample Analysis

The contractor shall request CLP analytical services in accordance with procedures outlined in the *User's Guide to the Contract Laboratory Program*, EPA, December 1986.

.4.2.1 Analyze Air/Gas Samples
(1) Organic
(2) Inorganic
(3) Radiochemistry

.4.2.2 Analyze Ground-Water Samples
(1) Organic
(2) Inorganic
(3) Radiochemistry

.4.2.3 Analyze Surface-Water Samples
(1) Organic
(2) Inorganic
(3) Radiochemistry

.4.2.4 Analyze Soil and Sediment Samples
(1) Organic
(2) Inorganic
(3) Radiochemistry

.4.2.5 Analyze Waste (Gas) Samples
(1) Organic
(2) Inorganic
(3) Radiochemistry

.4.2.6 Analyze Waste (Liquid) Samples
(1) Organic
(2) Inorganic
(3) Radiochernistry

.4.2.7 Analyze Waste (Solid) Samples
(1) Organic
(2) Inorganic
(3) Radiochemistry

.4.2.8 Analyze Biota Samples
(1) Organic
(2) Inorganic
(3) Radiochemistry

.4.2.9 Analyze Bioassay Samples

.4.2.10 Perform Bioaccumulation Studies

6.5 Analytical Support and Data Validation of Split Samples

The contractor shall arrange for the analysis and validation of environmental split samples collected. The sample analysis and validation task begins with reserving sample slots in the CLP and the completion of the RD field sampling program. This task ends with contractor validation of the analytical data received from the laboratory. The contractor shall perform the following activities or combination of activities to analyze and validate test results:

.5.1 Prepare and Ship Environmental Samples

.5.1.1 Ground-Water Samples
.5.1.2 Surface and Subsurface Soil Samples
.5.1.3 Surface-Water and Sediment Samples
.5.1.4 Air Samples
.5.1.5 Biota Samples
.5.1.6 Other Types of Media Sampling and Screening

.5.2 Coordinate With Appropriate Sample Management Personnel

.5.3 Implement EPA-Approved Laboratory QA Program

.5.4 Provide Sample Management (chain of custody, sample retention, and data storage)

.5.5 Perform Data Validation

The contractor shall perform appropriate data validation to ensure that the data are accurate and defensible. Complete the necessary summary tables, validation worksheets, and DQO summary forms.

Point for the WAM/RPM to consider:

For RD, full data validation procedures are usually not necessary. The WAM/RPM may want to specify the level of data validation required.

.5.5.1 Review Analysis Results Against Validation Criteria
.5.5.2 Provide Written Documentation of Validation Efforts
Implement quality control procedures to ensure the quality of all reports and submittals to EPA.

Point for the WAM/RPM to Consider:

You should specify the format for submissions if there are Region-specific requirements or if you have specific requirements.

6.6 Data Evaluation of Split Samples

This task involves comparison of the PRP's data that will be used in the remedial design effort with data resulting from the analysis of split samples. Data evaluation begins with the receipt of analytical data from the data acquisition task and ends with the submittal of a Data Evaluation Summary Report. Specifically, the contractor shall compare, evaluate, interpret, and tabulate data in an appropriate presentation format for final data tables.

.6.1 Data Useability Evaluation and Field QA/QC
.6.2 Data Reduction, Tabulation, and Evaluation
- .6.2.1 Evaluate Geological Data (Soils and Sediments)
- .6.2.2 Evaluate Air Data
- .6.2.3 Evaluate Hydrogeological Data-Ground Water
- .6.2.4 Evaluate Hydrogeological Data-Surface Water
- .6.2.5 Evaluate Waste Data
- .6.2.6 Evaluate Geophysical Data
- .6.2.7 Evaluate Ecological Data

.6.3 Modeling
- .6.3.1 Contaminant Fate and Transport
- .6.3.2 Water Quality
- .6.3.3 Ground Water
- .6.3.4 Air
- .6.3.5 Other Modeling

.6.4 Develop Data Evaluation Report

The contractor shall evaluate and present results in a Data Evaluation Summary Report to submit to the WAM/RPM for review and approval. The report will include a comparison of the split sample

6.6.4 (*continued*)

data collected with PRP data. After the WAM/RP's review, attend a meeting with EPA to discuss data evaluation results and next steps.

Point for the WAM/RPM to consider: You should specify the format for submissions if you have or the Region has specific requirements.

Implement quality control procedures to ensure the quality of all reports and submittals to EPA. These procedures shall include, but are not limited to, internal technical and editorial review; and the documentation of all reviews, the problems identified, and corrective actions taken.

Point for the WAM/RPM to consider: Specify that the contractor shall prepare and submit a Technical Memorandum to the WAM/RPM if new analytical data needs or significant data problems are identified during the evaluation.

6.7 Review of PRP Remedial Design Documents

This task involves work efforts to review PRP RD submittals. The contractor shall perform reviews to focus on the technical and engineering merit. Letter reports will be submitted upon the completion of each review by the oversight contractor within 21 calendar days of the start of the review, identifying specific issues and suggested corrective action, The following factors are to be considered during the review of all PRP submittals:

- Technical requirements of the ROD, Unilateral Administrative Order (UAO), Administrative Order of Consent (AOC), CD, and compliance with ARARs
- Standard professional engineering practices
- Applicable statutes, EPA policies, directives, and regulations (see Attachment 3)
- Spot checking design calculations to assess accuracy and quality of design activities
- Examination of planning and construction schedules for meeting project completion goals

The oversight contractor shall review the PRP-prepared planning, predesign, and design project documentation to ensure professional quality, technical accuracy, compliance with the PRP RD Work Plan, the ROD and Consent Decree, CERCLA, and all ARARs.

.7.1 Review PRP Remedial Design Documents

.7.1.1 Review Preliminary Design

(1) Project Delivery Strategy and Scheduling
(2) Preliminary Construction Schedule
(3) Specifications Outline
(4) Preliminary Drawings
(5) Basis of Design Report/Design Analysis
(6) Preliminary Cost Estimate
(7) PRP Description of Variances with ROD
(8) PRP Response to Design Review Comments
(9) Participate in Preliminary Design Review/Briefing

.7.1.2 Review (PRP Remedial) Intermediate Design Documents

(1) Construction Schedule
(2) Preliminary Specifications
(3) Intermediate Drawings
(4) Basis of Design Report/Design Analysis
(5) Revised Cost Estimate
(6) PRP Description of Variances with ROD
(7) PRP Response to Design Review Comments
(8) Participate in Intermediate Design Review/Briefing

.7.1.3 Review Prefinal/Final Design

(1) Prefinal Design Specifications
(2) Prefinal Drawings
(3) Basis of Design Report/Design Analysis
(4) Revised Cost Estimate
(5) Final Design Submittal
(6) Participate in Prefinal/Final Design Review
(7) Subcontract Award Docurnent(s)
(8) Biddability (Offerability) and Constructability Reviews
(9) Revised Project Delivery Strategy

.7.2 (Not used)

6.8 Technical Meeting Support

This task includes work efforts related to attendance at and documentation of meetings with EPA, PRPs, the PRP contractor, and the State Agency. The contractor shall attend meetings and provide documentation of meeting results. Within ___ days after a meeting, the contractor will submit to the WAM/RPM a written report summarizing the meeting results. Meetings may be scheduled to coincide with the following specific milestones during the RD/RA:

- At PRP RD Work Plan Review
- At Design Submittal Reviews
- Before initiating onsite field sampling and treatability study during design
- At completion of all sampling during design

6.9 Work Assignment Closeout

.9.1 Return Documents to Government

.9.2 Duplicate, Distribute, and Store Files

.9.3 Archive Files

.9.4 A Prepare Microfiche, Microfilm, and/or Optical Disk

.9.5 Prepare Closeout Report. The contractor shall include a breakdown on disk of final costs and Level of Effort (by P-level) in the same detail and format as the Work Breakdown Structure (Attachment 2).

Attachment 1
Summary of Major Submittals for the Remedial Design Oversight at
_____(Site)

TASK	DELIVERABLE	REF NO. *	NO. OF COPIES	DUE DATE (calendar days)	EPA REVIEW PERIOD
6.1.1.2	Site Visit Report		3	10 days after site visit	7 days after receipt of report
6.1.1.5	Draft RD Oversight Work Plan		3	30 days after initiation of work assignment (WA)	21 days after receipt of Work Plan
6.1.1.5	Final RD Oversight Work Plan		3	15 days after receipt of EPA comments	NA
6.1.16	Comments on Reviews of PRP Plans	5 8 19 21 36	3	21 days after receipt of work plans from EPA	NA
6.1.2.2	Draft HASP	36 19	3	30 days after initiation of WA	21 days after receipt of HASP
6.1.2.3(1)	Draft QAPP	21 8	3	30 days after initiation of WA	21 days after receipt of QAPP
6.1.2.3(2)	Draft FSP	5	3	30 days after initiation of WA	21 days after receipt of FSP
6.1.2.2	Final HASP	36 19	3	15 days after receipt of EPA comments	NA
6.1.2.3(1)	Final QAPP	21 8	3	15 days after receipt of EPA comments	NA
6.1.2.3(2)	Final FSP	5	3	15 days after receipt of EPA comments	NA
6.2.1	Draft Revised CRP	4	3	(#) days after initiation of WA	14 days after receipt of revised CRP

Attachment 1
Summary of Major Submittals for the Remedial Design Oversight at
_____(Site) (continued)

TASK	DELIVERABLE	REF NO. *	NO. OF COPIES	DUE DATE (calendar days)	EPA REVIEW PERIOD
6.2.1	Final Revised CRP	4	3	(#) days after receipt of EPA comments	NA
6.2.2	Fact Sheets		3	As needed	10 days after receipt of fact sheet
6.6.4	Data Evaluation Summary Report		3	10 days after receipt of analytical results from laboratory	15 days after receipt of report
6.7	Letter Reports		3	21 days after receipt of PRP design submittal	14 days after receipt of letter report

*See Attachment 3 for list of references .

Attachment 2
Work Breakdown Structure (WBS) for
Remedial Design Oversight (RDO)

February 8, 1994

6.0 Remedial Design Oversight

.01 Project Planning and Support

.01 Project Planning
- .01 Attend Scoping Meeting
- .02 Conduct Site Visit
- .03 Evaluate Existing Information
- .04 Oversight Work Plan Development
  - .01 Draft Oversight Work Plan Development
    - .01 Develop Narrative
    - .02 Develop Cost Estimate
    - .03 Internal QA & Submission
  - .02 Final Oversight Work Plan Preparation
    - .01 Attend Negotiation Meeting
    - .02 Modify Draft Work Plan and Cost Estimate
    - .03 Internal QA & Submission
- .05 Review PRP Plans
  - .01 Review PRP Site Management Plan
    - .01 Review PRP Pollution Control & Mitigation Plant
    - .02 Review PRP T&D Plan
  - .02 Review PRP Health & Safety Plan
  - .03 Review PRP Sampling & Analysis Plan (Chemical Data Acquisition Plan)
    - .01 Review PRP Quality Assurance Project Plan
    - .02 Review PRP Field Sampling Plan
    - .03 Review PRP Data Management Plan
  - .04 Other PRP Plan(s)

.02 Preparation of Site-Specific Plans
- .01 Not Used
- .02 Develop Health & Safety Plan
- .03 Sampling & Analysis Plan (Chemical Data Acquisition Plan)
  - .01 Quality Assurance Project Plan
  - .02 Field Sampling Plan
  - .03 Data Management Plan
  - .04 Other Plan(s)

.03 Project Management
- .01 Prepare Periodic Status Reports
  - .01 Document Cost and Performance Status
  - .02 Prepare/Submit Invoices
- .02 Meeting Participation/Routine Communications
- .03 Maintain Cost/Schedule Control System
- .04 Perform Value Engineering
- .05 Perform Engineering Network Analysis
- .06 Manage, Track, and Report Equipment Status
- .07 Work Assignment Closeout

.04 Subcontract Procurement/Support Activities
.01 ID and Procurement of Subcontractors
.01 Not used—Drilling Subcontractor
.02 Not used—Surveying Subcontractor
.03 Not used—Geophysical Subcontractor
.04 Not used—Site Preparation Subcontractor
.05 Analytical Services Subcontractor(s)
.06 Not used—Waste Disposal Subcontractor
.07 Not used—Treatability Subcontractor(s)
.08 Other(s)
.02 Contractor QA Program
.03 Perform Subcontract Management

.02 Community Involvement

.01 Community Involvement Plan (CRP) Development
.01 Conduct Community Interviews
.02 Update CRP
.01 Draft CRP
.02 Final CRP
.02 Prepare Fact Sheets
.03 Public Hearing, Meetings, & Availability Support
.01 Technical Support
.02 Logistical & Presentation Support
.03 Public Notice Support (writing, or placement of)
.04 Maintain Information Repository/Mailing List

.03 Data Acquisition Oversight

.01 Mobilization/Demobilization Oversight
.01 Not used—ID field support equipment/supplies/facilities
.02 Mobilization Oversight
.01 Site Preparation
.01 Perform Demolition
.02 Clearing and Grubbing
.03 Perform Earthwork
.01 Provide Borrow Pit
.02 Construct Haul Roads
.04 Construct Roads/Parking/Curbs/Walks
.05 Install Storm Drainage/Subdrainage
.06 Install Fencing/Site Security
.02 Installation of Utilities
.01 Install Electrical Distribution
.02 Install Telephone/Communication System(s)
.03 Install Water/Sewer/Gas Distribution
.04 Install Fuel Line Distribution
.03 Construction of Temporary Facilities
.01 Construct Decontamination Facilities
.02 Construct Sample/Derived Waste Storage Facility
.03 Construct Field Offices
.04 Construct Mobile Laboratory
.05 Construct Other Temporary Facilities
.03 Demobilization Oversight
.01 Removal of Temporary Facilities
.02 Site Restoration

.02 Field Investigation
- .01 Site Reconnaissance Oversight
  - .01 Ecological Resources Reconnaissance
  - .02 Well Inventory
  - .03 Residential Well Sampling
  - .04 Land Survey
  - .05 Topographic Mapping
  - .06 Field Screening
- .02 Geological Investigations Oversight (Soils/Sediments)
  - .01 Surface Soil Sample Collection
- .03 Air Investigations Oversight
- .04 Hydrogeological Investigations Oversight—Ground Water
  - .01 Well Systems Installation
  - .02 Collect Samples
  - .03 Hydro, Punch
  - .04 Tidal Influence Study
  - .05 Hydraulic Tests (Pump Tests)
  - .06 Ground-Water Elevation Measurement
- .05 Hydrogeological Investigations Oversight—Surface Water
- .06 Waste Investigation Oversight
- .07 Geophysical Investigation Oversight
- .08 Ecological Investigation Oversight
- .09 Contaminated Building Samples Oversight
- .10 Disposal of Investigation-Derived Waste Oversight
- .11 Prepare Data Acquisition Oversight Reports

.04 Sample Analysis of Splits

.01 Screening-Type Laboratory Sample Analysis
- .01 Analyze Air/Gas Samples
  - .01 Organic
  - .02 Inorganic
  - .03 Radiochemistry
- .02 Analyze Ground-Water Samples
  - .01 Organic
  - .02 Inorganic
  - .03 Radiochemistry
- .03 Analyze Surface Water Samples
  - .01 Organic
  - .02 Inorganic
  - .03 Radiochemistry
- .04 Analyze Soil/Sediment Samples
  - .01 Organic
  - .02 Inorganic
  - .03 Radiochemistry
- .05 Analyze Waste (Gas) Samples
  - .01 Organic
  - .02 Inorganic
  - .03 Radiochernistry
- .06 Analyze Waste (Liquid) Samples
  - .01 Organic
  - .02 Inorganic
  - .03 Radiochemistry
- .07 Analyze Waste (Solid) Samples
  - .01 Organic
  - .02 Inorganic

.03 Radiochemistry
.08 Analyze Biota Samples
.01 Organic
.02 Inorganic
.03 Radiochemistry
.09 Analyze Bioassay Samples
.10 Perform Bioaccumulation Studies

.02 CLP-Type Laboratory Sample Analysis
.01 Analyze Air/Gas Samples
.01 Organic
.02 Inorganic
.03 Radiochemistry
.02 Analyze Ground-Water Samples
.01 Organic
.02 Inorganic
.03 Radiochemistry
.03 Analyze Surface Water Samples
.01 Organic
.02 Inorganic
.03 Radiochemistry
.04 Analyze Soil/Sediment Samples
.01 Organic
.02 Inorganic
.03 Radiochemistry
.05 Analyze Waste (Gas) Samples
.01 Organic
.02 Inorganic
.03 Radiochemistry
.06 Analyze Waste (Liquid) Samples
.01 Organic
.02 Inorganic
.03 Radiochemistry
.07 Analyze Waste (Solid) Samples
.01 Organic
.02 Inorganic
.03 Radiochemistry
.08 Analyze Biota Samples
.01 Organic
.02 Inorganic
.03 Radiochemistry
.09 Analyze Bioassay Samples
.10 Perform Bioaccumulation Studies

.05 Analytical Support and Data Validation of Split Samples

.01 Prepare and Ship Environmental Samples
.01 Ground-Water Samples
.02 Surface and Subsurface Soil Samples
.03 Surface Water & Sediment Samples
.04 Air Samples
.05 Biota Samples
.06 Other types of media sampling and screening
.02 Coordinate with appropriate Sample Management personnel
.03 Implement EPA-approved Laboratory QA program
.04 Provide Sample Management (Chain of Custody, sample retention, & data storage)

.05 Perform Data Validation
- .01 Review analysis results against validation criteria
- .02 Provide written Documentation of validation efforts

.06 Data Evaluation of Split Samples

.01 Data Useability Evaluation/Field QA/QC
.02 Data Reduction, Tabulation and Evaluation
- .01 Evaluate Geological Data (Soils/Sediments)
- .02 Evaluate Air Data
- .03 Evaluate Hydrogeological Data—Ground Water
- .04 Evaluate Hydrogeological Data—-Surface Water
- .05 Evaluate Waste Data
- .06 Evaluate Geophysical Data
- .07 Evaluate Ecological Data

.03 Modeling
- .01 Contaminant Fate and Transport
- .02 Water Quality
- .03 Ground Water
- .04 Air
- .05 Other Modeling

.04 Develop Data Evaluation Report

.07 Review PRP Remedial Design Documents

.01 Review Preliminary Design
- .01 Project Delivery Strategy and Scheduling
- .02 Preliminary Construction Schedule
- .03 Specifications Outline
- .04 Preliminary Drawings
- .05 Basis of Design Report/Design Analysis
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- .05 Final Design Submittal
- .06 Participate in Prefinal/Final Design Review
- .07 Subcontract Award Document(s)
- .08 Biddability (offerability) and Constructability Reviews
- .09 Revised Project Delivery Strategy

.10 Document VE Modifications

.07.02 (Not Used)

.08 Technical Meeting Support

.09 Work Assignment Close Out

.01 Return Documents to Government
.02 File Duplication/Distribution/Storage
.03 File Archiving
.04 Microfiche/Microfilm/Optical Disk
.05 Prepare Closeout Report

Attachment 3
Regulations and Guidance Documents

The following list, although not comprehensive, comprises many of the regulations and guidance documents that apply to the RD process:

1. American National Standards Practices for Respiratory Protection. American National Standards Institute Z88.2-1980, March 11, 1981.

2. ARCS Construction Contract Modification Procedures September 89, OERR Directive 9355.5-01/FS.

3. CERCLA Compliance with Other Laws Manual, Two Volumes, U.S. EPA, Office of Emergency and Remedial Response, August 1988 (DRAFT), OSWER Directive No. 9234.1-01 and -02.

4. Community Relations in Superfund—A Handbook, U.S. EPA, Office of Emergency and Remedial Response, June 1988, OSWER Directive No. 9230.0-3B.

5. A Compendium of Superfund Field Operations Methods, Two Volumes, U.S. EPA, Office of Emergency and Remedial Response, EPA/540/P-87/001a, August 1987, OSWER Directive No. 9355.0-14.

6. Construction Quality Assurance for Hazardous Waste Land Disposal Facilities, U.S. EPA, Office of Solid Waste and Emergency Response, October 1986, OSWER Directive No. 9472.003.

7. Contractor Requirements for the Control and Security of RCRA Confidential Business Information, March 1984.

8. Data Quality Objectives for Remedial Response Activities, U.S. EPA, Office of Emergency and Remedial Response and Office of Waste Programs Enforcement, EPA/540/G-87/003, March 1987, OSWER Directive No. 9335.0-713.

9. Engineering Support Branch Standard Operating Procedures and Quality Assurance Manual, U.S. EPA Region IV, Environmental Services Division, April 1, 1986 (revised periodically).

10. EPA NEIC Policies and Procedures Manual, EPA-330/9-78-001-R, May 1978, revised November 1984.

11. Federal Acquisition Regulation, Washington, DC: U.S. Government Printing Office (revised periodically).

12. Guidance for Conducting Remedial Investigations and Feasibility Studies Under CERCLA, Interim Final, U.S. EPA, Office of Emergency and Remedial Response, October 1988, OSWER Directive NO. 9355.3-01.

13. Guidance on EPA Oversight of Remedial Designs and Remedial Actions Performed by Potential Responsible Parties, U.S. EPA Office of Emergency and Remedial Response, EPA/540/G-90/001, April 1990.

14. Guidance on Expediting Remedial Design and Remedial Actions, EPA/540/G-90/006, August 1990.

15. Guidance on Remedial Actions for Contaminated Ground Water at Superfund Sites, U.S. EPA Office of Emergency and Remedial Response (DRAFT), OSWER Directive No. 9283.1-2.

16. Guide for Conducting Treatability Studies Under CERCLA, U.S. EPA, Office of Emergency and Remedial Response, Prepublication version.

17. Guide to Management of Investigation-Derived Wastes, U.S. EPA, Office of Solid Waste and Emergency Response, Publication 9345.3-03FS, January 1992.

18. Guidelines and Specifications for Preparing Quality Assurance Project Plans, U.S. EPA, Office of Research and Development, Cincinnati, OH, QAMS-004/80, December 29, 1980.

19. Health and Safety Requirements of Employees Employed in Field Activities, U.S. EPA, Office of Emergency and Remedial Response, July 12, 1982, EPA Order No. 1440.2.

20. Interim Guidance on Compliance with Applicable of Relevant and Appropriate Requirements, U.S. EPA, Office of Emergency and Remedial Response, July 9, 1987, OSWER Directive No. 9234.0-05.

21. Interim Guidelines and Specifications for Preparing Quality Assurance Project Plans, U.S. EPA, Office of Emergency and Remedial Response, QAMS-005/80, December 1980.

22. Methods for Evaluating the Attainment of Cleanup Standards: Vol. 1, Soils and. Solid Media, February 1989, EPA 23/02-89-042; vol. 2, Ground water (Jul 1992).

23. National Oil and Hazardous Substances Pollution Contingency Plan; Final Rule, Federal Register 40 CFR Part 300, March 8, 1990.

24. NIOSH Manual of Analytical Methods, 2nd edition. Volumes I-VII for the 3rd edition, Volumes I and II, National Institute of Occupational Safety and Health.

25. Occupational Safety and Health Guidance Manual for Hazardous Waste Site Activities, National Institute of Occupational Safety and Health/Occupational Health and Safety Administration/United States Coast Guard/Environmental Protection Agency, October 1985.

26. Permits and Permit Equivalency Processes for CERCLA On-Site Response Actions, February 19, 1992, OSWER Directive 9355.7-03.

27. Procedure for Planning and Implementing Off-Site Response Actions, Federal Register, Volume 50, Number 214, November 1985, pages 45933-45937.

28. Procedures for Completion and Deletion of NPL Sites, U.S. EPA, Office of Emergency and Remedial Response, April 1989, OSWER Directive No. 9320.2-3A.

29. Quality in the Constructed Project: A Guideline for Owners, Designers and Constructors, Volume 1, Preliminary Edition for Trial Use and Comment, American Society of Civil Engineers, May 1988.

30. Remedial Design and Remedial Action Handbook (Draft), U.S. EPA, Office of Emergency and Remedial Response, August 1993, OSWER Directive No. 9355.5-22.

31. Revision of Policy Regarding Superfund Project Assigriments, OSWER Directive No. 9242.3-08, December 10, 1991. [Guidance, p. 2-21

32. Scoping the Remedial Design (Fact Sheet), February 1995, OSWER Publ. 9355-5-21 FS.

33. Standard Operating Safety Guides, U.S. EPA, Office of Emergency and Remedial Response, November 1984.

34. Standards for the Construction Industry, Code of Federal Regulations, Title 29, Part 1926, Occupational Health and Safety Administration.

35. Standards for General Industry, Code of Federal Regulations, Title 29, Part 1910, Occupational Health and Safety Administration.

36. Structure and Components of 5-Year Reviews, OSWER Directive No. 9355.7-02, May 23, 1991. [Guidance, p. 3-5]

37. Superfund Guidance on EPA Oversight of Remedial Designs and Remedial Actions Performed by Potentially Responsible Parties, April 1990, EPA/540/G-90/001.

38. Superfund Remedial Design and Remedial Action Guidance, U.S. EPA, Office of Emergency and Remedial Response, June 1986, OSWER Directive No. 9355.0-4A.

39. Superfund Response Action Contracts (Fact Sheet), May 1993, OSWER Publ. 9242.2-08FS.

40. TLVs-Threshold Limit Values and Biological Exposure Indices for 1987-88, American Conference of Governmental Industrial Hygienists.

41. Treatability Studies Under CERCLA, Final. U.S. EPA, Office of Solid Waste and Emergency Response, EPA/540/R-92/071a, October 1992.

42. USEPA Contract Laboratory Program Statement of Work for Inorganic Analysis, U.S. EPA, Office of Emergency and Remedial Response, July 1988.

43. USEPA Contract Laboratory Program Statement of Work for Organic Analysis, U.S. EPA, Office of Emergency and Remedial Response, February 1988.

44. User's Guide to the EPA Contract Laboratory Program, U.S. EPA, Sample Management Office, August 1982.

45. Value Engineering (Fact Sheet), U.S. EPA, Office of Solid Waste and Emergency Response, Publication 9355.5-03FS, May 1990.

Attachment 4

TRANSMITTAL OF DOCUMENTS FOR ACCEPTANCE BY EPA		DATE:	TRANSMITTAL NO.
TO:	FROM:		☐ New Transmittal ☐ Resubmittal of Transmittal No. _____

SUBTASK NO.	DELIVERABLE	NO. OF COPIES	REMARKS

ACCEPTANCE ACTION	
DOCUMENTS FOUND ACCEPTABLE (LIST BY SUBTASK NO.)	NAME/TITLE/SIGNATURE OF REVIEWER _____ DATE _____

Attachment 5

TRANSMITTAL REGISTER								
PROJECT TITLE AND LOCATION				CONTRACT NO.			WORK ASSIGNMENT NO.	
Subtask No.	DELIVERABLE	No. of Copies	Due Date	Transmittal No.	Date Received	Date Comments Sent to Contractor	EPA Acceptance Date	REMARKS

APPENDIX F
GLOSSARY OF ABBREVIATIONS AND ACRONYMS

A/E	Architect/Engineer
AOC	Administrative Order on Consent
ARAR	Applicable or Relevant and Appropriate Requirement (of other environmental laws)
ARCS	Alternative Remedial Contracts Strategy
BDAT	Best Demonstrated Available Treatment
CD	Consent Decree
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CERCLIS ...	Comprehensive Environmental Response, Compensation, and Liability Information System
CFR	Code of Federal Regulations
CICA	Competition in Contracting Act
CLP	Contract Laboratory Program
CO	Contracting Officer
CQA	Construction Quality Assurance
CQAPP	Construction Quality Assurance Project Plan
CSI	Construction Specification Institute
DBA	Davis-Bacon Act
DQO	Data Quality Objectives
EEO	Equal Employment Opportunity
EPA	Environmental Protection Agency
ERCS	Emergency Response Cleanup Services
FAR	*Federal Acquisition Regulation*
FFS	Focused Feasibility Studies
FS	Feasibility Study
FSAP	Field Sampling and Analysis Plan
FSP	Field Sampling Plan
FY	Fiscal Year
HASP	Health and Safety Plan
HUD	Housing and Urban Development
IAG	Interagency Agreement
IFB	Invitation for Bids
IGCE	Independent Government Cost Estimate
LAN	Local Area Network
LOE	Level of Effort

LTRA	Long-Term Response Actions
MBE	Minority Business Enterprise
MCL	Maximum Concentration Levels
MEI	Most Exposed Individual
MOA	Memorandum of Agreement
MOU	Memorandum of Understanding
NCP	National Contingency Plan
NOAA	National Oceanic and Atmospheric Administration
NPDES	National Pollutant Discharge Elimination System
NPL	National Priorities List
O&M	Operation and Maintenance
ODCs	Other Direct Costs
OERR	Office of Emergency and Remedial Response
ORD	Office of Research and Development
OSHA	Occupational Safety and Health Administration
OSWER	Office of Solid Waste and Emergency Response
OU	Operable Unit
PC	Project Coordinator
PO	Project Officer
POTW	Publicly Owned Treatment Works
PPE	Personal Protective Equipment
PRP	Potentially Responsible Party
QA	Quality Assurance
QAPP	Quality Assurance Project Plan
QC	Quality Control
RA	Remedial Action
RAC	Response Action Contract
RCRA	Resource Conservation and Recovery Act
RD	Remedial Design
RD/RA	Remedial Design/Remedial Action
REM	Remedial Management
REPR	Real Estate Planning Report
RFP	Request for Proposals
RI	Remedial Investigation
RI/FS	Remedial Investigation/Feasibility Study
ROD	Record of Decision
RPM	Remedial Project Manager

SACM	Superfund Accelerated Cleanup Model
SAP	Sampling Analysis Plan
SARA	Superfund Amendments and Reauthorization Act of 1986
SAS	Special Analytical Services
SDB	Small or Disadvantaged Business
SITE	Superfund Innovative Technology Evaluation
SMP	Site Management Plan
SOW	Statement of Work
START	Superfund Technical Assistance Response Team
TBC	To Be Considered
TCE	Trichloroethylene
TCLP	Toxicity Characteristic Leaching Procedure (RCRA)
TSCA	Toxic Substances Control Act
TSD	Treatment, Storage, and Disposal
UAO	Unilateral Administrative Order
USACE	U.S. Army Corps of Engineers
USBR	U.S. Bureau of Reclamation
VE	Value Engineering
VOCs	Volatile Organic Compounds
WA	Work Assignment
WAM	Work Assignment Manager
WBS	Work Breakdown Structure

INDEX

***Asterisk denotes graph or table.**

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