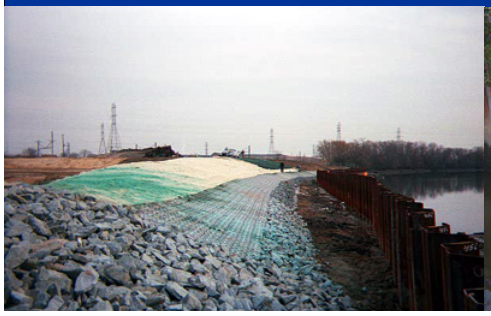



Module 5:

Remedial Process




Module Overview

- Module Objective: Discuss the definition of a remedial action and explain the major steps and activities performed in conducting remedial actions under CERCLA
- Topics:
  - » Phases of the remedial process
  - » General requirements for remedial actions under CERCLA
  - » Role and responsibilities of the RPM
  - » General activities and requirements for each phase of the remedial process
  - » Management of documents and other records

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Definition of Remedial Action

- Long-term action to achieve a permanent remedy
- Typical remedial actions

Major Phases in Remedial Process

- NCP defines six major phases in the remedial process
  - » RI
  - » FS
  - » Selection of remedy
  - » RD
  - » RA
  - » O&M (including site closeout)

Remedial Program Goal and Management Principles

- National goal of remedy selection is to select remedies that are:
  - » Protective of human health and the environment
  - » Maintain protection over time
  - » Minimize untreated waste
- Management principles:
  - » Sites should generally be remediated in OUs
  - » OUs should not be inconsistent with final remedy
  - » Data collection and alternative analysis reflects scope and complexity of site problems

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Expectations for Developing Appropriate Remedial Alternatives

- Use treatment to address principal threats wherever practicable
- Use engineering controls to address long-term, lower level threats
- Use a combination of treatment, engineering controls, and institutional controls
- Use institutional controls to supplement engineering controls
- Consider using innovative technologies
- Return usable groundwater to its beneficial uses wherever practicable

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Risk Management Principles: Remedial Action Objectives

- RAOs specify contaminants and media of concern, potential exposure pathways, and remediation goals
- PRGs are used initially and adjusted based on site-specific information
- Final remediation goals are determined when the remedy is selected

Risk Management Principles: Remediation Goals

- Establish acceptable exposure levels
- Must consider ARARs and facility siting laws and the following factors:
  - » For systemic toxicants, levels that do not cause adverse effects
  - » For carcinogens, levels corresponding to excess lifetime cancer risk between 10^{-4} and 10^{-6}
  - » For carcinogens, use 10^{-6} level as point of departure for PRGs when ARARs are not available or sufficiently protective because of multiple contaminants and pathways
  - » Factors related to technical limitations and uncertainty
  - » Other pertinent information

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Risk Management Principles: Additional Considerations for RAOs

- Attain MCLG set above zero where relevant and appropriate
- Attain MCL when MCLG is set at zero
- Attain water quality criteria where relevant and appropriate
- Establish alternative concentration level in accordance with CERCLA
- Evaluate environmental threats

Responsibilities of the RPM

- The RPM has the authority and the responsibility to:
  - » Participate in all decision-making processes
  - » Coordinate with all parties involved

Overview of the RI/FS Process

- RI/FS supports selection of the remedy
- RI is performed to characterize the site
- FS is used to develop and analyze remedial action alternatives
- Various lead agencies may conduct the RI/FS

Interdependency of the RI and FS

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Main Activities of the RI

- Site characterization
- Baseline risk assessment
- Treatability studies

Main Activities of the FS

- Development and screening of alternatives
- Detailed analysis of alternatives

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Development and Screening of Alternatives

- Development and screening involve seven general steps:
  - » Refine the RAOs
  - » Develop general response actions
  - » Identify volumes or areas of media
  - » Identify remedial technologies
  - » Identify and screen process options
  - » Assemble alternatives
  - » Screen alternatives

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Scoping the RI/FS

- Goal of RI/FS is to support the ROD
- RI/FS process begins with scoping
- Key Activities
  - » Form a site team
  - » Conduct a kickoff meeting with the site team
  - » Develop a CSM
  - » Identify initial DQOs
  - » Identify RAOs, general response actions, and ARARs
  - » Collect and evaluate existing data
  - » Conduct a site visit

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RI/FS Project Plans

- The RPM is responsible for overseeing the preparation of several work plans
  - » RI/FS work plan
  - » SAP
    - – QAPP
    - – FSP
  - » HASP
  - » CIP

RI/FS Report

- The RI/FS report
  - » Forms foundation of support in remedy selection process
  - » Documents the development and screening of remedial alternatives

Detailed Analysis of Alternatives

- Nine evaluation criteria are the basis for remedy selection
- The nine criteria are separated into three levels
  - » Threshold criteria
  - » Balancing criteria
  - » Modifying criteria

Nine Evaluation Criteria

- Threshold criteria
  - » Overall protection of human health and the environment
  - » Compliance with ARARs
- Balancing criteria
  - » Long-term effectiveness and permanence
  - » Reduction of toxicity, mobility, or volume through treatment
  - » Short-term effectiveness
  - » Implementability
  - » Cost
- Modifying criteria
  - » State (support agency) acceptance
  - » Community acceptance

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Overview of the Remedy Selection Process

- CERCLA establishes specific requirements
- The NCP establishes procedures for proposing and documenting final remedy
- Changes that occur after selection of the remedy need to be addressed
- EPA reforms to improve the quality of selected remedies

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CERCLA Requirements for Remedy Selection

- Protect human health and the environment
- Attain (or waive) ARARs
- Be cost-effective
- Use permanent solutions and alternative treatment technologies to the maximum extent practicable
- Satisfy the preference for treatment as a principal element of the remedy
- Involve states in a substantial and meaningful manner
- Consistency with the NCP

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The Remedy Selection Process

Step 1: Identify and select the preferred alternative in a proposed plan

- Review the RI/FS report
- Select the preferred alternative
- Prepare the proposed plan

→ Public comment on proposed plan →

Step 2: Document the final selection of the remedy in a ROD

- Review public comments
- Reassess the initial determination of the preferred alternative
- Select the final remedy
- Prepare a ROD and a responsiveness summary

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Proposed Plan

- Highlights key aspects of the RI/FS
- Describes remedial alternatives
- Explains the rationale for selection of the preferred alternative
- Requests comments from the public
- Includes the views of support agencies

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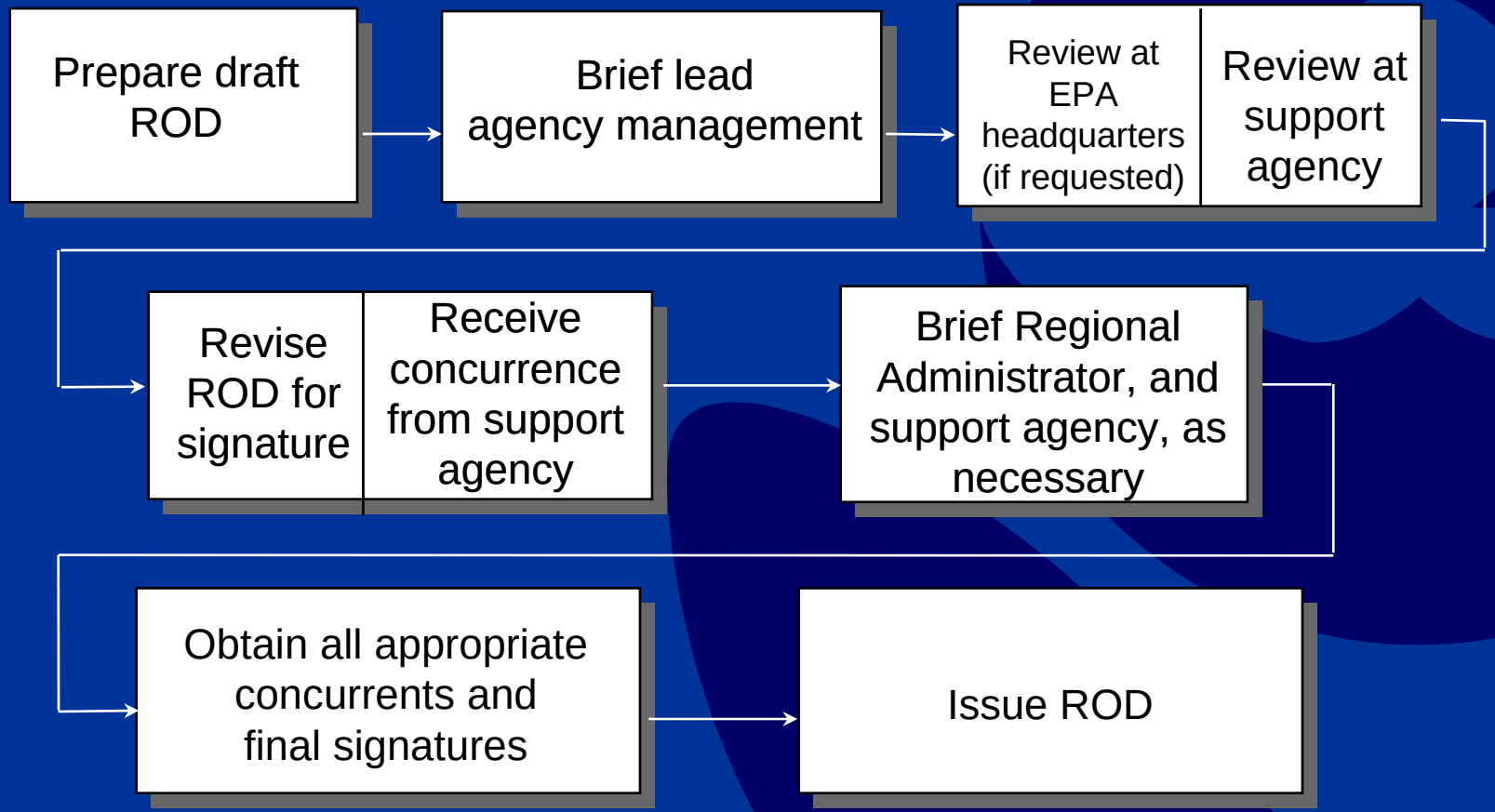
Document the Final Selection of the Remedy in a ROD

- Review public comments
  - » Address significant changes in the selected remedy
  - » Solicit additional comments
- Reassess initial determination of the preferred alternative
- Select the final remedy
  - » The lead agency has responsibility
  - » The PRP should not influence the decision
  - » The best balance among the criteria should be evaluated

ROD and Responsiveness Summary

- A ROD is:
  - The official decision document on remedy selection
  - A technical, legal, and public document
- A responsiveness summary is:
  - A written summary of responses to each significant comment submitted during the public comment period

Preparing the ROD



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Preparing the ROD

- The lead agency prepares the ROD
- EPA retains final authority over remedy selection
- The ROD is supported by documents in the AR
- Follow procedures for review, concurrence, and signature

Content of the ROD

- Declaration
  - » Formal statement signed by RA
- Decision summary
  - » Overview of problems and risks
  - » Rationale for remedy selection
- Responsiveness summary
  - » Addresses comments received

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Post-ROD Changes

- Changes are prompted by new information, enforcement agreements, or developments during RD/RA
- There are three types of ROD changes
  - » Minor
  - » Significant
  - » Fundamental
- Different requirements and procedures apply to each type of post-ROD change

Superfund Reforms — Remedy Selection

- Superfund reforms improve consistency in remedy selection