Decision-Making Framework for Cleanup of Sites Impacted with LNAPL

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The NAPL Cleanup Alliance, composed of industry and government partners, was formed in 2001 to promote practical and reasonable approaches to LNAPL management at impacted sites.

The Alliance has developed a guide or framework that describes a collaborative process for making sound decisions for NAPL management.
The Decision-making Framework

- Recognizes the complexity of the problem and site-specific challenges
- Is based upon participation by a broad stakeholder group
- Is primarily applicable to large complex sites, such as petroleum refineries
- Complies with existing regulatory requirements
The Decision-making Framework...

- Promotes an innovative consensus-based process focusing on long-term vision for a site
- Provides a roadmap based upon specific goals and endpoints to measure progress towards meeting the goals
- Is flexible, allowing for iterations that may be based upon receipt of new information
- Recognizes the need to manage the project in phases
Collaborative Decision-Making Process

Enter Process

Immediate hazard under control
Yes

Organize Resources
(Develop Conceptual Model & Initiate Stakeholder Process)

Determine LNAPL Distribution, Mobility and Recoverability

Review Conceptual Model, Risks, Long-Term Vision and Goals

Identify, Evaluate, and Select Management/Technology Options

Define Endpoints/Develop Contingency Plan

Implement and Monitor Performance

Evaluate Progress

Have Endpoints, Goal, and Vision been achieved? Yes

End Process

Is Management Option on Track to Meet Endpoints, Goal and Vision? Yes

Implement contingency plan, or reevaluate long-term vision or management options

No

Evaluate Risk & Technical Issues/Limitations

No

Implement control measures

Organize Resources
(Develop Conceptual Model & Initiate Stakeholder Process)

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Identify, Evaluate, and Select Management/Technology Options

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Implement control measures
Organize Resources

- Organize Resources (human, $, information)
  - Assess current state of knowledge
  - Develop the site conceptual model
  - Organize the stakeholder process
  - Identify stakeholders
  - Design, agree to, and implement a consensus-based process
Develop Long-term Vision & Goals

- Develop Long-term Vision
  - Discuss stakeholder interests
  - Develop a common understanding of the problem
  - Prepare the long-term vision statement

- Establish LNAPL Management Goals
  - Specific, measurable, achievable, results-oriented, and time-bound
  - Set goals for each phase of the project (all don’t need to be set up front)
Collect & Analyze Supplemental Data

- Targeted Objectives
  - LNAPL Distribution
  - LNAPL Mobility
  - LNAPL Recoverability
- Field Data Collection
- Laboratory Analyses
- Data Interpretation
Review and Refine Site Conceptual Model, Long-term Vision, and Goals

- Revisit previous definitions and decisions using new information collected during supplemental investigation
- Refinements can be made before evaluation of management options
Identify, Evaluate, and Select Management Options

- Process involves brainstorming followed by structured evaluation
- Treatment, removal, and containment technologies are considered
- Institutional controls are considered
- Technology or other option is selected and may be bench- or pilot-scale tested prior to implementation
- Design system to meet site specific needs
Define Endpoints and Develop Contingency Plan

• Define an endpoint for each of the goals so that progress towards meeting the goal can be measured
  • Endpoints provide very specific information, e.g., number and location of wells, type of analysis, etc.

• Contingency plans are developed as backup if goals are not met, endpoints are not achieved, and long-term vision is not achieved
  • Recognize uncertainties
Implement and Monitor

- Implementation occurs in phases to address specific goals for each phase
- Monitoring of progress at regular intervals is critical both during active and passive phases
Evaluate Progress

• Questions are asked regarding performance towards meeting endpoints, goals, and long-term vision
• If progress is not made, the contingency plan may be implemented; this may include iteration on the process
What Next?

- Document in EPA legal review; publication expected Summer 2004
- RTDF preparing training
  - Module 1 on The Science of LNAPL has been completed
  - Module 2 on LNAPL management is in preparation
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