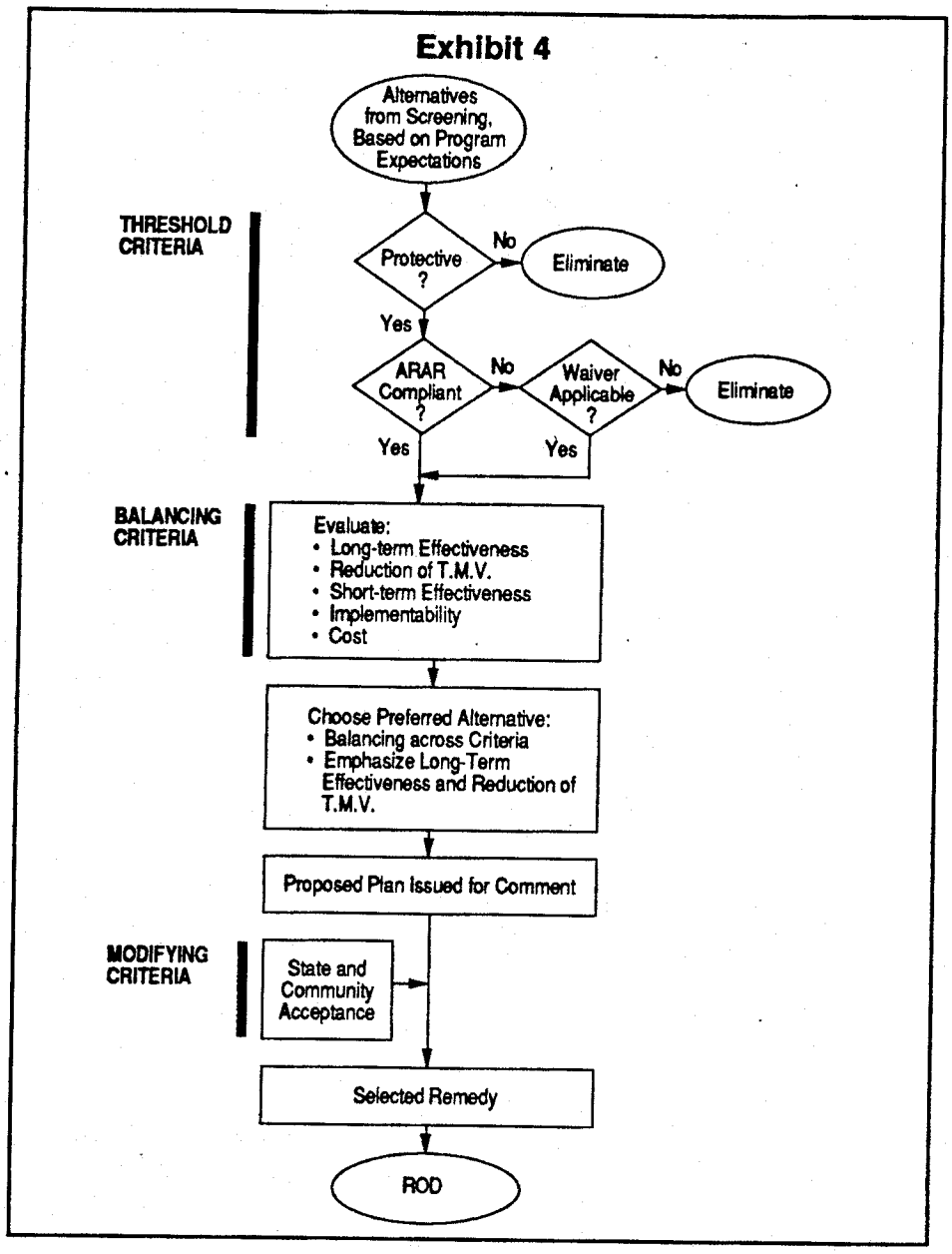


2. Reduction in the toxicity, mobility, or volume of contaminants achieved through the application of treatment technologies is the other criterion that will be emphasized during remedy selection in determining the maximum extent to which permanent solutions and treatment are practicable. Remedies that use treatment to address materials comprising the principal threats posed by a site are preferred over those that do not. Treatment as part of CERCLA remedies should generally achieve reductions of 90 to 99 percent in the concentrations or mobility of individual contaminants of concern. There will, however, be situations where reductions outside the 90 to 99 percent range will be appropriate to achieve site-specific remediation goals.

3. The short-term effectiveness of an alternative includes consideration of the time required for each alternative to achieve protection, as well as adverse short-term impacts that may be posed by their implementation. Many potential adverse impacts can be avoided by incorporating mitigative steps into the alternative. Poor short-term effectiveness can weigh significantly against an option and can, in fact, result in an alternative being rejected as unprotective if adverse impacts cannot be adequately mitigated.

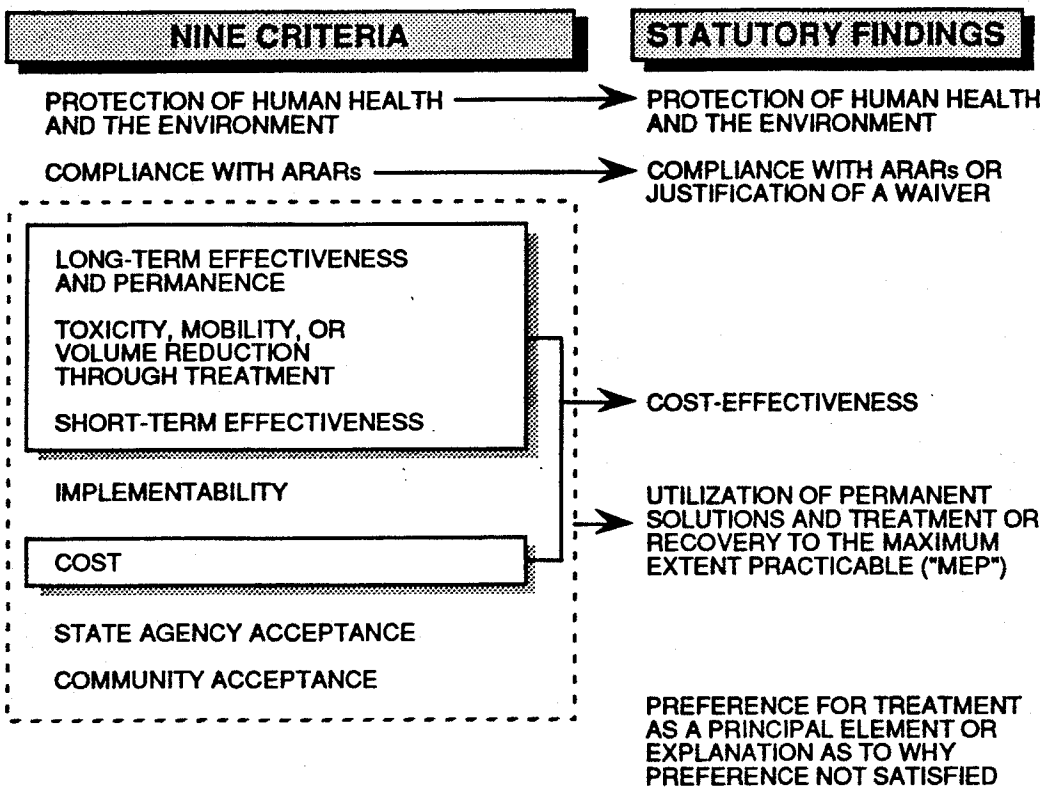
4. Implementability is particularly important for evaluating remedies at sites with highly heterogeneous wastes or media that make the performance of certain technologies highly uncertain. Implementability is also significant when evaluating technologies that are less proven and remedies that are dependent on a limited supply of facilities (e.g., TSCA-permitted land disposal facility), equipment (e..g., in-situ vitrification units), or experts.

5. Cost may play a significant role in selecting between options that appear comparable with respect to the other criteria, particularly long-term effectiveness and permanence, or when choosing among treatment options that provide similar performance. Cost generally will not be used to determine whether or not principal threats will be treated, except under special circumstances that make treatment impracticable (see expectations). Cost can never be used to pick a remedy that is not protective.

Modifying Criteria

If known at the completion of the RI/FS, state (support agency) and community acceptance of the alternatives should be considered with the results of the balancing criteria evaluation to identify the preferred alternative. After the public comment period, state and community acceptance are again considered, along with any new information, and may prompt modification of the preferred alternative.

Exhibit 5
Relationship of the Nine Criteria to the Statutory Findings



Identification of a Preferred Alternative

Once the relative performance of the protective and ARAR-compliant alternatives under each criterion has been established, preliminary determinations of which options are cost-effective and which alternatives utilize permanent solutions and treatment technologies to the maximum extent practicable are made to identify the preferred alternative. Exhibit 5 illustrates the relationship between the nine criteria and the statutory requirements for remedy selection.

Cost-effectiveness is determined by comparing the costs of all alternatives being considered with their overall effectiveness to determine whether the costs are proportional to the effectiveness achieved. Overall effectiveness for the purpose of this determination includes long-term effectiveness and permanence; reduction of toxicity, mobility, and volume through treatment; and short-term effectiveness. More than one alternative can be cost-effective.

The determination of which cost-effective alternative utilizes permanent solutions and treatment to the maximum extent practicable is a risk management judgment made by the decisionmaker who balances the tradeoffs among the alternatives with respect to the balancing criteria (and modifying criteria to the extent they are known). As a general rule, those criteria that distinguish the alternatives the most will be the most decisive factors in the balancing. See Exhibit 6 for a summary of criteria likely to be important in certain site situations. The alternative determined to provide the best balance of trade-offs, as considered in light of the statutory mandates and preferences, as well as the NCP goal and expectations, is identified as the preferred alternative and presented to the public for comment in a Proposed Plan.

Final Selection of Remedy

Upon receipt of public comments, the preferred alternative is reevaluated in light of any new information that has become available, including State and community acceptance, if previously unknown. This new information should be considered to determine whether an option other than the preferred alternative better fulfills the statutory requirements. The decisionmaker's final judgment is documented in a Record of Decision.

Exhibit 6
EXAMPLES OF PROMINENT CRITERIA AND EXPECTATIONS FOR SELECTED SITE SITUATIONS

SITUATION	PROMINENT CRITERIA	EXPECTED RESULT OF REMEDY SELECTION*
Small area of high levels of toxic contaminants (e.g., lagoon, hot spots)	Long-term effectiveness, Reduction of toxicity, mobility, or volume through treatment	Treatment is preferred when highly toxic material is a principal threat at a site
Highly mobile contaminants (e.g., liquids, volatiles, metals)	Long-term effectiveness, Reduction of mobility through treatment	Treatment is preferred when highly mobile material is a principal threat at a site
Very large volume of material contaminated marginally above health-based levels (e.g., mine tailings one order of magnitude above health-based levels in soil)	Implementability, Cost	Containment may afford high level of long-term effectiveness; treatment may be difficult to implement because of insufficient treatment capacity for large volume of material, and cost of treatment may be prohibitive due to large scope of site
Complex mixture of heterogeneous waste without discrete hot spots (e.g., heterogeneous municipal landfill waste)	Implementability, Short-term effectiveness, Cost	Treatment of heterogeneous waste often difficult or infeasible, reducing implementability; containment avoids short-term impacts and uncertainties associated with excavation; cost of treatment may be prohibitive
Soils contaminated with high concentrations of VOCs	Long-term effectiveness, Short-term effectiveness	In-situ treatment may be preferred over excavation because of negative short-term impacts and high cost of excavation
Contaminated ground water	Long-term effectiveness, Short-term effectiveness	Ground waters should be returned to beneficial use as soon as is practicable

* These are only examples and have been highly simplified for illustration purposes. They are not intended to prescribe certain remedies for certain situations.

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