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# Standard Guide for Remedy Selection Integrating Risk-Based Corrective Action and Non-Risk Considerations<sup>1</sup>

This standard is issued under the fixed designation E2616; the number immediately following the designation indicates the year of original adoption or, in the case of revision, the year of last revision. A number in parentheses indicates the year of last reapproval. A superscript epsilon ( $\epsilon$ ) indicates an editorial change since the last revision or reapproval.

## 1. Scope

1.1 This guide covers the selection of appropriate remedial actions at sites where a release of chemicals (for example, vapor-phase, dissolved-phase, or non-aqueous phase liquids (NAPL)) into the environment has occurred. This overall remedy selection process is illustrated in Fig. 1. The guide is intended to be applied within a risk-based corrective action (RBCA) framework.

1.2 The purpose of this guide is to facilitate the selection of acceptable remedial actions and to minimize bad decisions leading to the selection of remedial actions that do not satisfy both the risk-based remedial action objectives and the non-risk remedial action objectives.

1.3 This guide is intended to be applied at sites that require a remedial action to address unacceptable human health or ecological risks, other regulatory requirements, and/or other unacceptable site conditions. Prior to use of this guide, a site assessment should be completed resulting in: (1) the establishment of remedial action objectives, (2) a determination that a remedial action is required to achieve the remedial action objectives, (3) an identification of site areas requiring a remedial action, and (4) a conceptual site model that reflects the results of the site assessment. The risk-based remedial action objectives are assumed to have been established using RBCA or another risk-based assessment method that results in the identification of appropriate remedial action objectives based on an evaluation of sources, exposure pathways, and potential receptors. Remedial action objectives may be established using Guide E1739, Guide E2081, and/or Guide E2205. In addition, applicable federal, state, and local regulations, statutes, and policies should be followed and should form the basis for determining risk-based and non-risk remedial action objectives. The remedial action objectives may include resource protection standards and the prevention of aesthetic or nuisance impacts in addition to protection of human health and the environment.

<sup>1</sup> This guide is under the jurisdiction of ASTM Committee E50 on Environmental Assessment, Risk Management and Corrective Action and is the direct responsibility of Subcommittee E50.04 on Corrective Action.

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1.4 Each risk-based remedial action objective for an exposure pathway will typically include numeric remedial action levels for each chemical of concern (COC). Remedial action levels may also be developed for non-risk remedial action objectives such as resource protection standards. The non-risk remedial action levels may include thickness or mobility criteria for NAPL. The selected remedy must be effective and timely for each remedial action objective based on the consideration of the associated exposure pathway or resource protection standard.

1.5 To facilitate the selection of acceptable remedial actions, this guide establishes a process for remedy selection (Fig. 2) that involves:

1.5.1 *Development of risk-based remedial action objectives* that includes identification of complete exposure pathways and numeric remedial action levels (Section 5).

1.5.2 *Development of non-risk remedial action objectives* based on resource protection and other non-risk considerations. Resource protection objectives typically include numeric remedial action levels while other non-risk criteria are typically non-numeric and may include: remediation timeframe, implementability, cost effectiveness, regulatory compliance, property use requirements, liability control, and community concern (Section 5).

1.5.3 *Evaluation of protectiveness* to identify protective remedial actions that will be effective and timely for each risk-based remedial action objective for the site (Section 6).

1.5.4 *Evaluation of the retained remedies using the non-risk remedial action objectives* to identify acceptable remedial actions that satisfy the minimum level for each non-risk criterion (Section 7).

1.5.5 *Remedial action selection* to select the acceptable remedial action to be implemented at the site (Section 8).

1.5.6 *Remedy design and implementation* to ensure that the selected remedy is effectively implemented at the site and satisfies the remedial action objectives (Section 9).

1.6 This guide is intended for use in the selection of final remedial actions. This guide may also be used in the selection of interim measures provided that risk-based remedial action objectives and non-risk remedial action objectives are available for the evaluation of these interim measures.

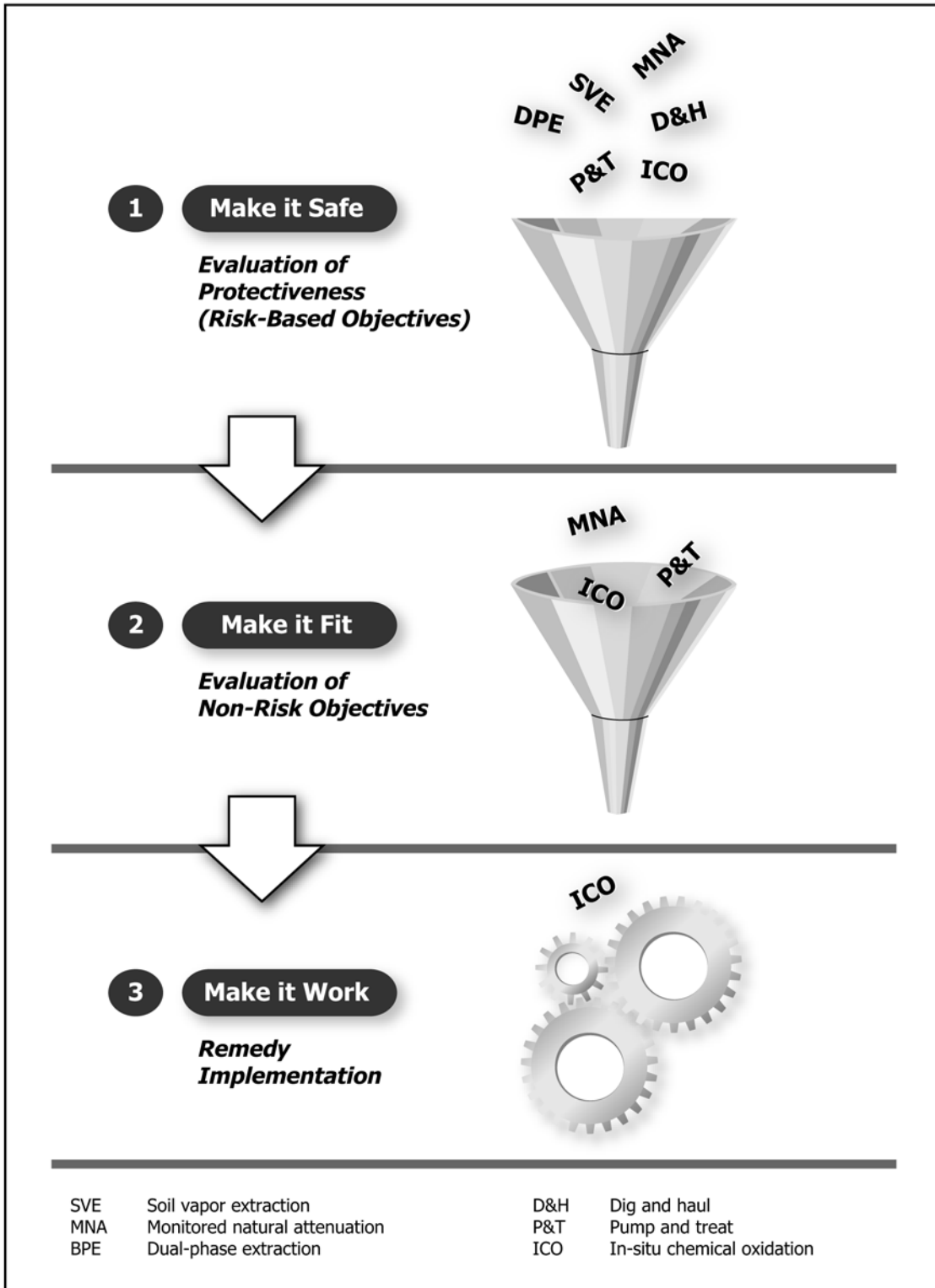
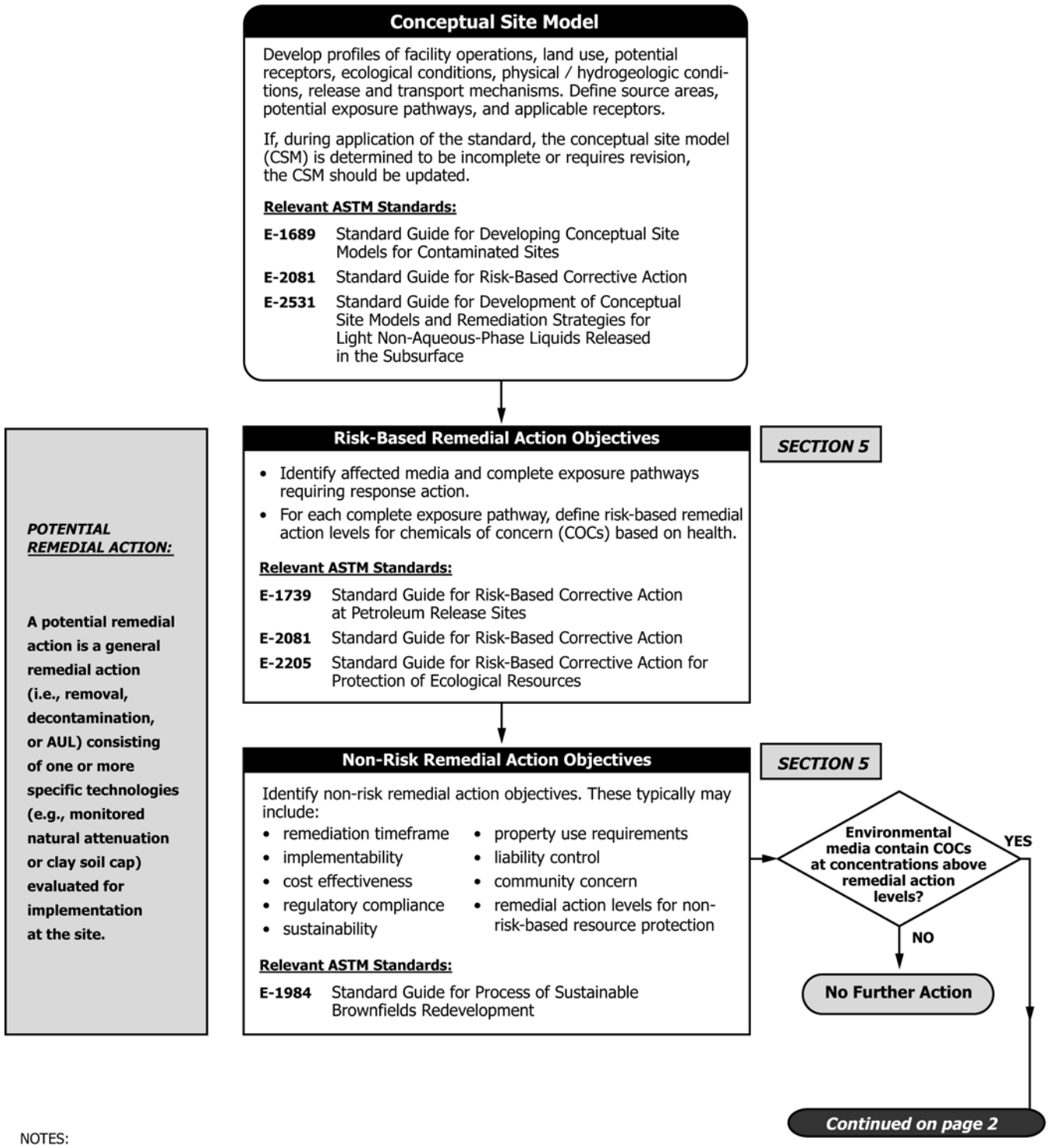


FIG. 1 Remedy Selection Process

1.7 The values stated in SI units are to be regarded as standard. No other units of measurement are included in this standard.

1.8 This guide is not intended to specifically address contractor health and safety issues. It is the responsibility of the user of this guide to ensure that Occupational Safety and



NOTES:

TI = Technical Impracticability  
 AUL = Activity and Use Limitation

FIG. 2 Remedy Selection Flowchart