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Standard Guide for Selecting and Using Ecological Endpoints for Contaminated Sites¹

This standard is issued under the fixed designation E 1848; 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 (ε) indicates an editorial change since the last revision or reapproval.

1. Scope

1.1 This guide covers an approach to identification, selection and use of ecological endpoints (both assessment and measurement endpoints) **(1-8)**² that are susceptible to the direct and indirect effects of both chemical and non-chemical stressors or agents associated with wastes and contaminated media at specific sites under current and future land uses. It does not address assessment and measurement endpoints for non-site specific studies (for example, chemical-specific or regional risk assessments) or measurements in abiotic media (soil, water, or air).

1.2 This guide addresses only the identification, selection and use of assessment and measurement endpoints, not the full range of activities that occur in an ecological assessment or ecological risk assessment at a contaminated site **(1,3-8)**. These activities are addressed in other ASTM guides and references provided at the end of this guide.

1.3 This guide is intended to identify assessment and measurement endpoints to be used for screening, preliminary, focused, detailed and quantitative ecological risk assessments conducted in a linear or iterative fashion **(3,8)**. This is a partial, not complete listing of possible levels of assessment. In a tiered ecological risk assessment, it may be necessary to redefine ecological endpoints when planning to collect more data or when additional site data are obtained and evaluated.

1.4 This guide is intended to be used by trained biologists, ecologists and ecotoxicologists familiar with risk assessment, ecological and ecotoxicological concepts.

1.5 This guide (including Appendix X1) consists of a series of options or instructions and does not recommend a specific course of action or provide detailed guidelines to be followed at all sites. See 2.2.2 of *Regulations Governing ASTM Technical Committees*.³

1.6 *This standard does not purport to address all of the safety concerns, if any, associated with its use. It is the responsibility of the user of this standard to establish appro-*

priate safety and health practices and determine the applicability of regulatory limitations prior to use.

2. Referenced Documents⁴

2.1 ASTM Standards:

E 943 Terminology Relating to Biological Effects and Environmental Fate⁵

E 1689 Guide for Developing Conceptual Site Models for Contaminated Sites⁵

3. Terminology

3.1 *Definitions*—Definitions are provided specifically for use with this guide. Many of the terms listed in this section have been modified from those defined in other publications **(1-8)**.

3.2 Definitions of Terms Specific to This Standard:

3.2.1 *assessment endpoint*—an explicit expression of an environmental value (ecological, not monetary) to be protected **(3)**.

3.2.1.1 *Discussion*—An assessment endpoint is an ecological condition of potential concern or effect experienced by an ecological receptor with ecological and societal value that drives risk-based decision-making at a contaminated site (for example, a specific reduction in the abundance of a fish population or the disruption of the structure of benthic community). It is a qualitative quantitative or quantifiable expression, measure, metric or index involving an ecological receptor at risk. Under some circumstances, assessment endpoints may be measured and used directly for assessment purposes. Assessment endpoints are the ultimate focus in risk characterization and link measurement endpoints (see below) to policy goals and the risk management process **(1-3,5,6,8)**.

3.2.2 *chemical stressor*—a chemical, chemical mixture or radionuclide present in an environmental medium that is known or suspected to induce an adverse biological, toxicological or ecological response in an exposed ecological receptor **(3-8)**.

3.2.2.1 *Discussion*—A chemical stressor is often referred to as an "ecological contaminant of concern."

¹ This guide is under the jurisdiction of ASTM Committee E47 on Biological Effects and Environmental Fate and is the direct responsibility of Subcommittee E47.05 on Risk Assessment, Communication, and Management.

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² The boldface numbers given in parentheses refer to a list of references at the end of the text.

³ Available from ASTM Headquarters.

⁴ A bibliography of related references and documents is provided in Appendix X2.

⁵ *Annual Book of ASTM Standards*, Vol 11.05.