



Standard Guide for Evaluating Potential Hazard as a Result of Methane in the Vadose Zone¹

This standard is issued under the fixed designation E2993; 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 provides a consistent basis for assessing site methane in the vadose zone, evaluating hazard and risk, determining the appropriate response, and identifying the urgency of the response.

1.2 *Purpose*—This guide covers techniques for evaluating potential hazards associated with methane present in the vadose zone beneath or near existing or proposed buildings or other structures (for example, potential fires or explosions within the buildings or structures), when such hazards are suspected to be present based on due diligence or other site evaluations (see 6.1.1).

1.3 *Objectives*—This guide: (1) provides a practical and reasonable industry standard for evaluating, prioritizing, and addressing potential methane hazards and (2) raises awareness of the key variables needed to properly evaluate such hazards.

1.4 This guide offers a set of instructions for performing one or more specific operations. This guide cannot replace education or experience and should be used in conjunction with professional judgment. Not all aspects of this guide may be applicable in all circumstances. This guide is not intended to represent or replace the standard of care by which the adequacy of a given professional service should be judged, nor should this guide be applied without consideration of a project's many unique aspects. The word “Standard” in the title means only that the guide has been approved through the ASTM International consensus process.

1.5 Not addressed by this guide are:

1.5.1 Requirements or guidance or both with respect to methane sampling or evaluation in federal, state, or local regulations. Users are cautioned that federal, state, and local guidance may impose specific requirements that differ from those of this guide;

1.5.2 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;

1.5.3 Emergency response situations such as sudden ruptures of gas lines or pipelines;

1.5.4 Methane entry into an enclosure from other than vadose zone soils (for example, methane evolved from well water brought into an enclosure; methane generated directly within the enclosure; methane from leaking natural gas lines or appliances within the enclosure, etc.);

1.5.5 Methane entry into an enclosure situated atop or immediately adjacent to a municipal solid waste (MSW) landfill;

1.5.6 Potential hazards from other gases and vapors that may also be present in the subsurface such as hydrogen sulfide, carbon dioxide, and/or volatile organic compounds (VOCs);

1.5.7 Anoxic conditions in enclosed spaces;

1.5.8 The forensic determination of methane source; or

1.5.9 Potential consequences of fires or explosions in enclosed spaces or other issues related to safety engineering design of structures or systems to address fires or explosions.

1.6 *Units*—The values stated in SI units are to be regarded as the standard.

1.6.1 *Exception*—Values in inch/pound units are provided for reference.

1.7 *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 appropriate safety and health practices and determine the applicability of regulatory limitations prior to use.*

2. Referenced Documents

2.1 *ASTM Standards*:²

D653 Terminology Relating to Soil, Rock, and Contained Fluids

D1356 Terminology Relating to Sampling and Analysis of Atmospheres

D1946 Practice for Analysis of Reformed Gas by Gas Chromatography

¹ 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 E50.02 on Real Estate Assessment and Management.

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² For referenced ASTM standards, visit the ASTM website, www.astm.org, or contact ASTM Customer Service at service@astm.org. For *Annual Book of ASTM Standards* volume information, refer to the standard's Document Summary page on the ASTM website.