



Standard Practices for Electrical Methods for Locating Leaks in Geomembranes Covered with Water or Earthen Materials¹

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1. Scope

1.1 These practices cover standard procedures for using electrical methods to locate leaks in geomembranes covered with water or earthen materials. For clarity, this practice uses the term “leak” to mean holes, punctures, tears, knife cuts, seam defects, cracks, and similar breaches in an installed geomembrane (as defined in 3.2.5).

1.2 These practices are intended to ensure that leak location surveys are performed with demonstrated leak detection capability. To allow further innovations, and because various leak location practitioners use a wide variety of procedures and equipment to perform these surveys, performance-based operations are used that specify the minimum leak detection performance for the equipment and procedures.

1.3 These practices require that the leak location equipment, procedures, and survey parameters used are demonstrated to result in an established minimum leak detection distance. The survey shall then be conducted using the demonstrated equipment, procedures, and survey parameters.

1.4 Separate procedures are given for leak location surveys for geomembranes covered with water and for geomembranes covered with earthen materials. Separate procedures are given for leak detection distance tests using actual and artificial leaks.

1.5 Examples of methods of data analysis for soil-covered surveys are provided as guidance in [Appendix X1](#).

1.6 Leak location surveys can be used on geomembranes installed in basins, ponds, tanks, ore and waste pads, landfill cells, landfill caps, and other containment facilities. The procedures are applicable for geomembranes made of materials such as polyethylene, polypropylene, polyvinyl chloride, chlorosulfonated polyethylene, bituminous material, and other electrically-insulating materials.

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 These practices are under the jurisdiction of ASTM Committee [D35](#) on Geosynthetics and is the direct responsibility of Subcommittee [D35.10](#) on Geomembranes.

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1.8 (**Warning**—The electrical methods used for geomembrane leak location could use high voltages, resulting in the potential for electrical shock or electrocution. This hazard might be increased because operations might be conducted in or near water. In particular, a high voltage could exist between the water or earthen material and earth ground, or any grounded conductor. These procedures are potentially VERY DANGEROUS, and can result in personal injury or death. The electrical methods used for geomembrane leak location should be attempted only by qualified and experienced personnel. Appropriate safety measures must be taken to protect the leak location operators as well as other people at the site.)

1.9 *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

[D4439 Terminology for Geosynthetics](#)

[D6747 Guide for Selection of Techniques for Electrical Leak Location of Leaks in Geomembranes](#)

3. Terminology

3.1 For general definitions related to geosynthetics, see Terminology [D4439](#).

3.2 *Definitions of Terms Specific to This Standard:*

3.2.1 *artificial leak, n*—an electrical simulation of a leak in a geomembrane.

3.2.2 *current source electrode, n*—the electrode that is placed in the water or earthen material above the geomembrane.

3.2.3 *dipole measurement, n*—an electrical measurement made on or in a partially conductive material using two closely-spaced electrodes.

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.