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Standard Guide for Using the Electronic Cone Penetrometer for Environmental Site Characterization¹

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^{ε1} NOTE—This standard was corrected editorially in January 2000.

1. Scope

1.1 The electronic cone penetrometer test often is used to determine subsurface stratigraphy for geotechnical and environmental site characterization purposes (1).² The geotechnical application of the electronic cone penetrometer test is discussed in detail in Test Method D 5778, however, the use of the electronic cone penetrometer test in environmental site characterization applications involves further considerations that are not discussed.

1.2 The purpose of this guide is to discuss aspects of the electronic cone penetrometer test that need to be considered when performing tests for environmental site characterization purposes.

1.3 The electronic cone penetrometer test for environmental site characterization projects often requires steam cleaning the push rods and grouting the hole. There are numerous ways of cleaning and grouting depending on the scope of the project, local regulations, and corporate preferences. It is beyond the scope of this guide to discuss all of these methods in detail. A detailed explanation of grouting procedures is discussed in Guide D 6001.

1.4 *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.*

1.5 This guide is applicable only at sites where chemical (organic and inorganic) wastes are a concern and is not intended for use at radioactive or mixed (chemical and radioactive) waste sites.

1.6 The values stated in either SI units or inch-pound units are to be regarded as standard. Within the text, the inch-pound units are shown in brackets. The values stated in each system are not equivalents, therefore, each system must be used independently of the other.

2. Referenced Documents

2.1 ASTM Standards:

- C 150 Specification for Portland Cement³
- D 653 Terminology Relating to Soil, Rock, and Contained Fluids⁴
- D 2488 Practice for Description and Identification of Soils (Visual-Manual Procedure)⁴
- D 3441 Test Method for Deep, Quasi-Static, Cone and Friction-Cone Penetration Tests of Soil⁴
- D 5088 Practice for Decontamination of Field Equipment Used at Nonradioactive Waste Sites⁴
- D 5092 Practice for Design and Installation of Ground Water Monitoring Wells in Aquifers⁴
- D 5730 Guide to Site Characterization for Environmental Purposes⁵
- D 5778 Test Method for Performing Electronic Friction Cone and Piezocone Penetration Testing of Soils⁵
- D 6001 Guide for Direct Push Water Sampling for Geoenvironmental Investigations⁵

3. Terminology

3.1 *Definitions*—The definitions of terms in this guide are in accordance with Terminology D 653. Terms that are not included in Terminology D 653 are described as follows.

3.2 Definitions of Terms Specific to This Standard:

3.2.1 *baseline, n*—a set of zero load readings, expressed in terms of apparent resistance, that are used as reference values during performance of testing and calibration.

3.2.2 *bentonite, n*—the common name for drilling fluid additives and well construction products consisting mostly of naturally occurring sodium montmorillonite. Some bentonite products have chemical additives that may affect water quality analyses.

3.2.3 *cone, n*—the conical point of a cone penetrometer on which the end bearing component of penetration resistance is developed.

3.2.4 *cone resistance, q_c, n*—the end bearing component of penetration resistance.

¹ This guide is under the jurisdiction of ASTM Committee D-18 on Soil and Rock and is the direct responsibility of Subcommittee D18.21 on Ground Water and Vadose Zone Investigations.

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² The boldface numbers in parentheses refer to the list of references at the end of this guide.

³ Annual Book of ASTM Standards, Vol 04.01.

⁴ Annual Book of ASTM Standards, Vol 04.08.

⁵ Annual Book of ASTM Standards, Vol 04.09.