



Standard Test Method for (Analytical Procedure) for Determining Transmissivity and Storage Coefficient of Confined Nonleaky or Leaky Aquifer by Constant Drawdown Method in Flowing Well¹

This standard is issued under the fixed designation D5855/D5855M; 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 test method covers an analytical solution for determining transmissivity and storage coefficient of a leaky or nonleaky confined aquifer. It is used to analyze data on the flow rate from a control well while a constant head is maintained in the well.

1.2 This analytical procedure is used in conjunction with the field procedure in Practice D5786.

1.3 *Limitations*—The limitations of this technique for the determination of hydraulic properties of aquifers are primarily related to the correspondence between field situation and the simplifying assumption of the solution.

1.4 *Units*—The values stated in either SI units or inch-pound units are to be regarded separately as standard. The values in each system may not be exact equivalents; therefore each system shall be used independently of the other. Combining values from the two systems may result in nonconformance with the standard. Reporting of test results in units other than SI shall not be regarded as nonconformance with this test method.

1.5 All observed and calculated values shall conform to the guidelines for significant digits and rounding established in Practice D6026.

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

¹ This test method is under the jurisdiction of ASTM Committee D18 on Soil and Rock and is the direct responsibility of Subcommittee D18.21 on Groundwater and Vadose Zone Investigations.

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2. Referenced Documents

2.1 ASTM Standards:²

D653 Terminology Relating to Soil, Rock, and Contained Fluids

D3740 Practice for Minimum Requirements for Agencies Engaged in Testing and/or Inspection of Soil and Rock as Used in Engineering Design and Construction

D4043 Guide for Selection of Aquifer Test Method in Determining Hydraulic Properties by Well Techniques

D5786 Practice for (Field Procedure) for Constant Drawdown Tests in Flowing Wells for Determining Hydraulic Properties of Aquifer Systems

D6026 Practice for Using Significant Digits in Geotechnical Data

3. Terminology

3.1 Definitions:

3.1.1 For definitions of terms used in this test method, see Terminology D653.

3.2 Symbols and Dimensions:

3.2.1 T —transmissivity [$L^2 T^{-1}$].

3.2.2 K_1 —modified Bessel function of the second kind, first order [nd].

3.2.3 K_2 —modified Bessel function of the second kind, zero order [nd].

3.2.4 J_0 —Bessel function of the first kind, zero order [nd].

3.2.5 Y_0 —Bessel function of the second kind, zero order [nd].

3.2.6 $W(u)$ — w (well) function of u [nd].

3.2.7 u —variable of integration [nd].

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.