



Standard Guide for Use of Dual-Wall Reverse-Circulation Drilling for Geoenvironmental Exploration and the Installation of Subsurface Water-Quality Monitoring Devices¹

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1. Scope

1.1 This guide covers how dual-wall reverse-circulation drilling may be used for geoenvironmental exploration and installation of subsurface water-quality monitoring devices.

NOTE 1—The term *reverse circulation* with respect to dual-wall drilling in this guide indicates that the circulating fluid is forced down the annular space between the double-wall drill pipe and transports soil and rock particles to the surface through the inner pipe.

NOTE 2—This guide does not include considerations for geotechnical site characterizations that are addressed in a separate guide.

1.2 Dual-wall reverse-circulation for geoenvironmental exploration and monitoring-device installations will often involve safety planning, administration, and documentation. This guide does not purport to specifically address exploration and site safety.

1.3 The values stated in SI units are to be regarded as the standard. The inch-pound units given in parentheses are for information only.

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.*

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1.6 *This guide offers an organized collection of information or a series of options and does not recommend a specific course of action. This document 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 ASTM standard is not intended to represent or replace the standard of care by which the adequacy of a given professional service must be judged, nor should this document be applied without consideration of a project's many unique aspects. The word "Standard" in the title of this document means only that the document has been approved through the ASTM consensus process.*

2. Referenced Documents

2.1 ASTM Standards:

D 653 Terminology Relating to Soil, Rock, and Contained Fluids²

D 1452 Practice for Soil Investigation and Sampling by Auger Borings²

D 1586 Test Method for Penetration Test and Split-Barrel Sampling of Soils²

D 1587 Test Method for Thin-Walled Tube Sampling of Soils²

D 2487 Classification of Soils for Engineering Purposes²

D 3550 Practice for Ring-Lined Barrel Sampling of Soils²

D 4428/D4428M Test Method for Crosshole Seismic Testing²

D 5088 Practice for Decontamination of Field Equipment Used at Non-Radioactive Waste Sites³

D 5092 Practice for Design and Installation of Ground Water Monitoring Wells in Aquifers³

D 5099 Test Method for Rubber—Measurement of Processing Properties Using Capillary Rheometry⁴

D 5254 Practice for Minimum Set of Data Elements to Identify a Ground-Water Site³

D 5434 Guide for Field Logging of Subsurface Explorations of Soil and Rock³

3. Terminology

3.1 Definitions:

3.1.1 Terminology used within this guide is in accordance with Terminology D 653. Definitions of additional terms may be found in Terminology D 653.

3.2 Definitions of Terms Specific to This Standard:

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

3.2.2 *bentonite granules and chips*—irregularly-shaped particles of bentonite (free from additives) that have been dried and separated into a specific size range.

3.2.3 *bentonite pellets*—roughly spherical- or disc-shaped

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 *Annual Book of ASTM Standards*, Vol 04.08.

³ *Annual Book of ASTM Standards*, Vol 04.09.

⁴ *Annual Book of ASTM Standards*, Vol 09.01.

