



Standard Guide for Applying Statistical Methods for Assessment and Corrective Action Environmental Monitoring Programs¹

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1. Scope

1.1 The scope and purpose of this guidance is to present a variety of statistical approaches for assessment, compliance and corrective action environmental monitoring programs. Although the methods provided here are appropriate and often optimal for many environmental monitoring problems, they do not preclude use of other statistical approaches that may be equally or even more useful for certain site-specific applications.

1.2 In the following sections, the details of select statistical procedures used in assessment and corrective action programs for environmental monitoring (soil, groundwater, air, surface water, and waste streams) are presented.

1.3 The statistical methodology described in the following sections should be used as guidance. Other methods may also be appropriate based on site-specific conditions or for monitoring situations or media that are not presented in this document.

1.4 This practice 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, experience and professional judgements. Not all aspects of this practice 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 without consideration of a project's many unique aspects. The word Standard in the title of this document only means that the document has been approved through the ASTM consensus process.

1.5 *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 requirements prior to use.*

¹ This guide 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

D5092 Practice for Design and Installation of Groundwater Monitoring Wells

D5792 Practice for Generation of Environmental Data Related to Waste Management Activities: Development of Data Quality Objectives

D6250 Practice for Derivation of Decision Point and Confidence Limit for Statistical Testing of Mean Concentration in Waste Management Decisions

D6312 Guide for Developing Appropriate Statistical Approaches for Groundwater Detection Monitoring Programs

3. Terminology

3.1 *Definitions*—For definitions of common terms in this guid, see Terminology D653.

3.2 Definitions of Terms Specific to This Standard:

3.2.1 *corrective action monitoring*—under RCRA (in the United States), corrective action monitoring is instituted when hazardous constituents from a RCRA regulated unit have been detected at statistically significant concentrations between the compliance point and the downgradient facility property boundary as specified under 40 CFR 264.100. Corrective action monitoring is conducted throughout a corrective action program that is implemented to address groundwater contamination. At non-RCRA sites, corrective action monitoring is conducted throughout the active period of corrective action to determine the progress of remediation and to identify statistically significant trends in groundwater contaminant concentrations.

3.2.2 *false positive rate*—the rate at which the statistical procedure indicates contamination when contamination is not present.

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.