



Designation: D5738 – 95(Reapproved 2006)

Standard Guide for Displaying the Results of Chemical Analyses of Groundwater for Major Ions and Trace Elements—Diagrams for Single Analyses¹

This standard is issued under the fixed designation D5738; 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 guide covers the category of water-analysis diagrams that use pictorial or pattern methods (for example, bar, radiating vectors, pattern, and circular) as a basis for displaying each of the individual chemical components that were determined from the analysis of a single sample of natural groundwater (see Terminology).

1.2 This guide on single-analysis diagrams is the second of several standards to inform the professionals in the field of hydrology with the traditional graphical methods available to display groundwater chemistry.

NOTE 1—The initial guide described the category of water-analysis diagrams that use two-dimensional trilinear graphs to display, on a single diagram, the common chemical components from two or more complete analyses of natural groundwater.

1.2.1 A third guide will be for diagrams based on data analytical calculations that include those categories of water analysis graphs where multiple analyses are analyzed statistically and the results plotted on a diagram (for example, the box, and so forth).

1.3 Numerous methods have been developed to display, on single-analyses diagrams, the ions dissolved in water. These methods were developed by investigators to assist in the interpretation of the origin of the ions in the water and to simplify the comparison of analyses, one with another.

1.4 This guide presents a compilation of diagrams from a number of authors that allows for transformation of numerical data into visual, usable forms. It is not a guide to selection or use. That choice is program or project specific.

NOTE 2—Use of tradenames in this guide is for identification purposes only and does not constitute endorsement by ASTM.

1.5 *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:²

D596 Guide for Reporting Results of Analysis of Water
D653 Terminology Relating to Soil, Rock, and Contained Fluids
D1129 Terminology Relating to Water
D5754 Guide for Displaying the Results of Chemical Analyses of Groundwater for Major Ions and Trace Elements—Trilinear Diagrams for Two or More Analyses

3. Terminology

3.1 Definitions:

3.1.1 Except as listed as follows, all definitions are in accordance with Terminology D653.

3.1.2 *anion*—an ion that moves or would move towards an anode; thus nearly always synonymous with negative ion.

3.1.3 *cation*—an ion that moves or would move towards a cathode; thus nearly always synonymous with positive ion.

3.1.4 *equivalent per million (epm)*—for water chemistry, an equivalent weight unit expressed in English terms, also expressed as milligram-equivalent per kilogram. When the concentration of an ion, expressed in parts per million (ppm), is multiplied by the equivalent weight (combining weight) factor (see explanation of equivalent weight factor) of that ion, the result is expressed in epm.

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.

Current edition approved July 1, 2006. Published August 2006. Originally approved in 1995. Last previous edition approved in 2000 as D5738 – 95 (2000). DOI: 10.1520/D5738-95R06.

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.