



# Standard Guide for Planning, Carrying Out, and Reporting Traceable Chemical Analyses of Water Samples<sup>1</sup>

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## 1. Scope

1.1 This guide sets a protocol for generating and reporting chemical analyses that are traceable to SI Units or to Certified Reference Materials in laboratories that serve the water and environmental industry.

1.2 *This guide does not purport to address the safety problems 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.*

## 2. Referenced Documents

### 2.1 ASTM Standards:

D 1129 Terminology Relating to Water

D 6362 Standard Practice for Certificates of Reference Materials for Water Analysis

IEEE/ASTM SI 10–1997 Standard for use of the International System of Units (SI): the modern metric system

### 2.2 Other Documents:

ISO Guide 17025: General Requirements for the Competence of Calibration and Testing Laboratories<sup>2</sup>

ISO Guide 30: Terms and definitions used in connection with reference materials<sup>2</sup>

International Vocabulary of Basic and General Terms in Metrology [VIM]: ISO: 2nd ed., 1993<sup>2</sup>

## 3. Terminology

3.1 *Definitions*—For definitions of terms used in this Guide, refer to D 1129, Terminology Relating to Water.

3.1.1 *certified reference material*—reference material, accompanied by a certificate, one or more of whose property values are certified by a procedure which established its traceability to an accurate realization of the unit in which the property values are expressed, and for which each certified value is accompanied by an uncertainty at a stated level of confidence. (ISO Guide 30:1992) (Note 1).

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<sup>2</sup> Available from American National Standards Institute, 11 West 42nd St., 13th Floor, New York, New York, 10036

NOTE 1—There is significant variation in the overall quality of commercially available Certified Reference Materials and caution should be used when choosing Certified Reference Materials. Use ASTM D 6362 to provide guidance as to what information needs to be included on Certificate of a Certified Reference Material.

3.1.2 *traceability*—property of the result of a measurement or the value of a standard whereby it can be related, with a stated uncertainty, to stated references, usually national or international standards, through an unbroken chain of comparisons. (ISO Guide 30:1992).

3.1.3 *uncertainty (of measurement)*—parameter, associated with the result of a measurement that characterizes the dispersion of values that could reasonably be attributed to the measured. (International Vocabulary of Basic and General Terms in Metrology [VIM] (ISO: 2nd ed., 1993).

3.1.4 *work plan*—a documented procedure intended for use by a laboratory to meet the measurement traceability requirements of a defined need.

3.1.5 *SI units*—this is the International System of Units (SI) which is the modernized Metric System as described in IEEE/ASTM SI 10-1997. A SI Quick Reference Guide is included at the back (in the “gray pages”) of volumes 11.01 and 11.02.

## 4. Significance and Use

4.1 This Guide establishes basic requirements which should be met by water and environmental laboratories that generate and report test chemical analyses which the laboratory client desires to be traceable to SI Units (Note 2) or Certified Reference Materials traceable to SI Units. Traceability of chemical analyses is important because it provides a uniform basis for the comparison of results from different measurement systems and because it relates those results to our current knowledge of physical laws. (Note 3)

NOTE 2—A Certified Reference Material traceable to SI Units is a Certified Reference Material whose value can be related with a stated uncertainty through an unbroken change of comparisons to stated references (usually national or international standards) in SI Units, such as a primary measurement made in SI Units or a national standard certified in SI Units.

NOTE 3—Not all chemical analysis results can be traceable to SI Units or to Certified Reference Material’s traceable to SI Units, such as Turbidity and or Total Suspended Solids.