



Designation: E3318 – 23

Standard Terminology for Standards Relating to Stormwater Control Measures¹

This standard is issued under the fixed designation E3318; 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 These definitions apply to many terms found in the standards of ASTM Committee E64.

1.2 This terminology standard defines terms related to stormwater control measures in the various sections of standards under the jurisdiction of ASTM Committee E64.

1.3 *Units*—The values stated in inch-pound units are to be regarded as standard, except for methods to establish and report sediment concentration and particle size. It is convention to exclusively describe sediment concentration in mg/L and particle size in mm or μm , both of which are SI units. The SI units given in parentheses are mathematical conversions, which are provided for information purposes only and are not considered standard. Reporting of test results in units other than inch-pound units shall not be regarded as non-conformance with this test method.

1.4 *This international standard was developed in accordance with internationally recognized principles on standardization established in the Decision on Principles for the Development of International Standards, Guides and Recommendations issued by the World Trade Organization Technical Barriers to Trade (TBT) Committee.*

2. Referenced Documents

2.1 ASTM Standards:²

D3977 Test Methods for Determining Sediment Concentration in Water Samples

D4959 Test Method for Determination of Water Content of Soil By Direct Heating

D6913/D6913M Test Methods for Particle-Size Distribution (Gradation) of Soils Using Sieve Analysis

D7928 Test Method for Particle-Size Distribution (Gradation) of Fine-Grained Soils Using the Sedimentation

¹ This test method is under the jurisdiction of ASTM Committee E64 on Stormwater Control Measures and is the direct responsibility of Subcommittee E64.01 on Lab Evaluation.

Current edition approved June 1, 2023. Published June 2023. Originally approved in 2022. Last previous edition approved in 2022 as E3318 – 22. DOI: 10.1520/E3318-22.

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.

(Hydrometer) Analysis

2.2 Additional References:³

Standard Method SM 2540D Total Suspended Solids (SM 22nd Edition)

3. Significance and Use

3.1 The purpose of this standard is to provide uniform terminology used in the development of methods and standards relating to ASTM Committee E64 on Stormwater Control Measures (SCMs).

4. Terminology

aliquot, *n*—a portion of a sample.

Authority Having Jurisdiction (AHJ), *n*—a regulatory body having authority over the certification of Manufactured Treatment Devices (MTDs) for use within its jurisdiction.

automated sampler, *n*—a portable unit that can be programmed to collect discrete sequential samples on a time-weighted or flow-weighted basis.

Best Management Practice (BMP), *n*—activities or structural improvements that help reduce the quantity and/or improve the quality of stormwater runoff.

DISCUSSION—BMPs include treatment facilities, operating procedures, and practices to control site runoff from roadways, parking lots, rooftops, and landscaped areas. BMPs can also include the management of spillage or leaks, sludge or waste disposal, or drainage from raw material storage. Sometimes considered synonymous with Stormwater Control Measures (SCMs).

certification, *n*—a certification is granted by AHJs to allow SCMs to be approved and then specified within their jurisdiction.

DISCUSSION—The certifying body uses verification reports to determine the SCM sizing based on local treatment needs. The certification can also dictate other factors including, structural requirements, operations and maintenance requirements, land use restrictions, etc.

clear water, *n*—any water free of test sediment with a background Suspended Sediment Concentration (SSC) concentration of less than 20 mg/L.

³ Available from American Water Works Association (AWWA), 6666 W. Quincy Ave., Denver, CO 80235, <http://www.awwa.org>.

commercially available, phrase, *n*—a MTD which is engineered, sold, and deployed in the field for use as a SCM.

DISCUSSION—In some cases, the unit tested is a prototype of the units that will be offered as a product for sale once verified. The hydraulic and water quality operational parameters are offered at nominal full-size dimension or scale. The material components of the MTD that do not affect hydraulic or water quality performance, can be composed of alternate materials when specified for commercial use.

composite sample, *n*—a mixed or combined sample that is formed by combining a series of individual and discrete samples or aliquots taken at equal volumes or specified intervals.

DISCUSSION—Samples can be time-weighted (taken at uniform intervals of time) or flow-weighted (taken at uniform increments of flow volume).

D_{50} , *n*—as relates to *Particle Size Distribution*, D_{50} is also known as the median diameter or the median value of a particle size distribution, it is the value of the particle diameter at 50 % in the cumulative distribution.

DISCUSSION—For example, if the $D_{50} = 20.0 \mu\text{m}$, then 50 % by weight (dry) of the particles of a particular sample are finer than $20.0 \mu\text{m}$.

Effective Sedimentation Area (ESA), *n*—the entire area within a hydrodynamic separator (HDS) where sedimentation occurs, including any pretreatment chambers.

Effective Sedimentation Treatment Area (ESTA), *n*—the entire area within a HDS where treatment occurs, including any pretreatment.

effluent, *n*—water discharging from a treatment SCM.

DISCUSSION—Effluent may consist of treated flow or comingled treated and untreated flow.

effluent sampling analysis, *n*—a method of determining removal efficiency of a SCM by measuring the average particle concentration, in mg/L of effluent samples as compared to the average particle concentration of influent introduced into the unit at a given flow rate

false floor, *n*—for the purposes of sediment removal efficiency testing and scour testing, a temporary construct in a MTD test device used to simulate performance of a partially loaded system for sediment removal efficiency testing.

geometrically proportional (geometric similitude), *n*—for the purposes of scaling a MTD, a different size MTD is considered geometrically proportional if the functional components of the device are dimensionally proportional to the unit tested; two units that are geometrically proportional are said to have geometric similitude.

Hydraulic Loading Rate (HLR), *n*—for treatment SCMs the HLR is a measure of the influent flow rate per the ESTA of the treatment unit; the HLR is commonly expressed in units of gallons per minute per square foot (GPM/ft²).

DISCUSSION—For HDS units the HLR is a measure of the influent flow rate (Q) per the ESTA, ($\text{HLR} = Q/\text{ESTA}$). The HLR can also be termed the Surface Loading Rate (SLR).

DISCUSSION—For filters, the HLR is the filter unit flow rate per the effective filter surface area. The filter HLR can also be called the flux or the specific flow rate (q).

hydraulic similarity (hydraulic similitude), *n*—two MTDs are considered to have hydraulic similarity if the functional components are designed such that the hydraulic characteristics are similar; hydraulic similarity can be demonstrated by showing that appropriate dimensionless numbers, such as the Froude or Reynolds number, are the same for the two units.

Hydrodynamic Separator (HDS), *n*—A flow through MTD that is designed to remove sediment particles and associated pollutants from stormwater runoff by gravitational forces.

DISCUSSION—HDS units are used as standalone treatment for solids removal or pretreatment for filters, ponds, bioretention, infiltration facilities, etc.

hydrometer, *n*—an indexed buoyancy device used to measure the bulk density or specific gravity of a particulate suspension in water used for the determination of particle size distribution.

influent, *n*—water entering a treatment SCM

DISCUSSION—Influent flow may be untreated or partially treated flow.

maintenance sediment storage depth and volume, *n*—the sediment storage depth and corresponding volume of a MTD which represents the amount of sediment that can accumulate in the MTD prior to maintenance, as recommended by the manufacturer.

Manufactured Treatment Device (MTD), *n*—an engineered structural treatment system which is commercially available and can remove some or all pollutants including Trash and Debris, TSS, SSC, metals, nutrients, and hydrocarbons from stormwater runoff.

DISCUSSION—A MTD can employ settling, filtration, and/or other processes or combination of processes to remove pollutants from runoff. MTDs are a subset of SCMs. In Australia, an equivalent term is a SQID (stormwater quality improvement device).

mass capture analysis, *n*—a method of determining removal efficiency of a MTD by measuring the total amount of mass introduced as compared to the total amount of mass retained in the MTD at the conclusion of a test.

Maximum Hydraulic Flow Rate (MHFR), *n*—the flow rate at which a MTD can convey flow without exceeding hydraulic grade line restrictions.

Maximum Treatment Flow Rate (MTFR), *n*—the highest flow rate that can be conveyed through a MTD to achieve the verified performance-based claims for pollutant removal.

Particle Size Distribution (PSD), *n*—a list of values that defines the relative amount, by mass, of sediment particles present according to size as determined by Test Methods **D6913/D6913M** and **D7928**.

DISCUSSION—Can use interchangeably with gradation as defined in Test Methods **D6913/D6913M**, “gradation, *n*—in soil, the proportion by mass of various particle sizes;” where “soil” is understood to mean “a sample of sediment.”

Quality Assurance Project Plan (QAPP), *n*—a written document that outlines the procedures and methods a field monitoring or laboratory testing verification protocol will use to ensure that the methods used, samples collected and

analyzed, data stored and statistically analyzed, and the corresponding reports are of high enough quality to ensure that the results accurately reflect the performance of the tested MTD.

scour, *v*—the resuspension and washout of previously captured sediment, resulting in loss of previously captured pollutants from a treatment device.

source control, *n*—management measures that prevent the generation or release of a pollutant into the environment by elimination or measures that keep a pollutant out of contact with rainfall and stormwater runoff.

DISCUSSION—Elimination of pollutant sources such as copper rivets from brake pads are referred to a “True Source Control” where, for example, covering a pollutant source from rainfall or street sweeping are referred to as an “Operational Source Control.”

Stormwater Control Measure (SCM), *n*—a technique, measure, or structural control that is used for a given set of conditions to manage the quantity and/or improve the quality of stormwater runoff including water quality improvement, volume control, flow control, and flood control.

DISCUSSION—Sometimes considered synonymous/used interchangeably with Best Management Practices (BMPs).

Surface Loading Rate (SLR), *n*—for HDS units, a measure of the influent flow rate to a SCM divided by the ESTA; also known as the Hydraulic Loading Rate (HLR)

Suspended Sediment Concentration (SSC), *n*—the concentration of sediments suspended in a water column as defined by analytical testing in accordance with Test Methods **D3977**.

Total Suspended Solids (TSS), *n*—a measure of solids suspended in water as defined by the method of measurement which is Standard Method SM 2540D.

trash and debris, *n*—settleable, suspended, and floating solid objects found in stormwater runoff with at least two dimensions (length, width, or diameter) greater than or equal to 5.0 millimeters.

DISCUSSION—Trash is considered as objects of anthropogenic origin. Debris is considered as objects of natural origin. Sometimes Trash and Debris are referred to as Gross Pollutants.

Trash Capture Device (TCD), *n*—a MTD which is designed to remove trash and debris from stormwater runoff and in some cases, windblown or saltating trash and debris.

DISCUSSION—A TCD is also known as a gross pollutant trap (GPT) in other parts of the world.

verification, *n*—a defined process managed by a verification entity by which test reports are found to be accurate and in compliance with a QAPP and a designated protocol and test method; once a verification is completed the associated

documentation is deemed accurate and has met or exceeded the protocol requirements.

DISCUSSION—Verification reports can be used as a basis for certification by AHJs.

verification entity, *n*—a public or private organization which provides verification services for MTDs and other SCMs.

Water Quality Flow Rate (WQFR), *n*—the design flow rate at which a MTD is sized to meet a specific water quality treatment target.

Water Surface Elevation (WSE), *n*—the vertical distance from a reference datum to the surface of water at atmospheric pressure.

5. Symbols, Abbreviations, and Acronyms

AHJ—Authority Having Jurisdiction

BMP—Best Management Practice

ESA—Effective Sedimentation Area

ESTA—Effective Sedimentation Treatment Area

GPT—Gross Pollutant Trap

HDS—Hydrodynamic Separator

HLR—Hydraulic Loading Rate

MHFR—Maximum Hydraulic Flow Rate

MTD—Manufactured Treatment Device

MTFR—Maximum Treatment Flow Rate

PSD—Particle Size Distribution

Q—Flow rate expressed in ft³/sec or gallons/minute

QAPP—Quality Assurance Project Plan

SCM—Stormwater Control Measure

SLR—Surface Loading Rate

SQID—Stormwater Quality Improvement Device

SSC—Suspended Sediment Concentration

TCD—Trash Capture Device

TSS—Total Suspended Solids

WQFR—Water Quality Flow Rate

WSE—Water Surface Elevation

6. Keywords

6.1 AHJ; BMP; filters; GPT; HDS; hydrodynamic; MTD; PSD; QAPP; SCM; sedimentation; separator; SQID; SSC; stormwater; trash and debris; TSS; verification