National Onsite Wastewater Recycling Association

Decentralized Wastewater Glossary

Third Edition*

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30-day (30-d) average

Average of daily measurements over a 30-d period, calculated as the sum of all daily measurements taken during a 30-d period divided by the number of daily measurements taken during that 30-d period. Each new 30-d average begins on the day following the end of the previous average

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30-day (30-d) geometric mean (geo mean)

Type of average, calculated as the nth root of the product of n values (daily measurements) taken over a 30-d period. Each new 30-d geometric mean begins on the day following the end of the previous geometric mean

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7-day (7-d) average

Average of daily measurements over a 7-d period, calculated as the sum of all daily measurements taken during a 7-d period divided by the number of daily measurements taken during that 7-d period. Each new 7-d average begins on the day following the end of the previous average

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abandonment

Discontinued use of a system component or components by removing them or rendering them inaccessible and inoperable.

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above-grade

Soil treatment area designed and installed such that all or part of the infiltrative surface is located at or above original ground elevation using appropriate imported material; cover of suitable soil stabilizes the final grade, supports vegetative growth and sheds runoff; includes mounds and elevated systems; see also at-grade and below-grade.

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absorption

Process of incorporation or assimilation by which one substance is physically taken into and included with another substance; for example, plant roots assimilating nutrients from the soil.

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absorption area

Design parameter described by the square footage of an absorptive surface that is associated with the hydraulic acceptance of effluent; see also absorptive surface; basal area; and infiltrative surface.

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absorptive surface

Plane of native soil where hydraulic properties change.

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acceptable

Condition in which a component is performing its intended purpose and is in an operable state; see also, unacceptable.

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acceptance rate

Infiltration of effluent into a designated media expressed as a rate (e.g., cm/day); see also long-term acceptance rate.

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accepted engineering practices

Requirements which are compatible with standards of practice required of a registered professional engineer.

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access riser

Conduit facilitating access to subsurface components of a wastewater treatment system.

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acetogenesis

Conversion of volatile fatty acids to acetic acid, hydrogen gas and carbon dioxide.

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acidogenesis

Conversion of fatty acids to volatile fatty acids and sugars to acetic acid, hydrogen gas and carbon dioxide.

activated carbon filter

Device filled with a porous form of carbon that is used to decolorize liquids, recover solvents, and remove toxins and odors from water and air.

activated sludge

Highly concentrated mass of live organisms in a suspended growth aerated and mixed environment.

activated sludge process

Wastewater treatment process that uses activated sludge to biologically convert non-settleable (suspended, dissolved, and colloidal) organic materials to a settleable product using aerobic and facultative microorganisms; typically followed by clarification and sludge return.

active aeration

Process of introducing air via either mechanical means or diffused aeration; see also aeration, passive.

additive

Product added to a sewage treatment system and marketed to improve performance.

adsorption

Adhesion of a substance to the surface of solid bodies or liquids with which it is in contact.

advanced secondary treatment

Level of treatment that achieves 95% reduction in BOD and TSS, generally to levels below 10 mg/L.

advanced treatment

Any post-sedimentation treatment process or sequential treatment processes that reduce contaminants to specified target levels prior to conveyance to a final treatment and dispersal component, reuse or recycling; often, this treatment is designed to meet advanced secondary, tertiary, and/or disinfection treatment standards.

aeration

Process of introducing air into a treatment component or process

aeration chamber

Chamber or tank in which wastewater is brought into contact with air to facilitate biological degradation such as in (but not limited to) the activated sludge process.

aeration system

Piping, diffusers, air source, vents, and all other necessary devices for an active aeration process.

aeration tank

Tank or compartment in which wastewater is brought into contact with air to facilitate biological degradation such as in (but not limited to) the activated sludge process.

aerator

Mechanical device used to introduce air into a treatment component or process.

aerobic

Having molecular oxygen (O_2) as a part of the environment, or a biological process that occurs only in the presence of molecular oxygen; see also anaerobic and anoxic.

aerobic bacteria

Bacteria that can metabolize only in the presence of molecular oxygen.

aerobic treatment

Digestion of organic matter in an environment containing molecular (or dissolved) oxygen (O_2).

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aerobic treatment unit (ATU)

1. Treatment component that utilizes oxygen to degrade or decompose wastewater, with or without mechanical means; 2. Term traditionally used to describe proprietary devices that use direct introduction of air into wastewater by mechanical means to maintain aerobic conditions within the pretreatment component.

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aggregate

1. Primary soil particles that cohere to each other more strongly than other surrounding particles; 2. naturally-occurring inorganic material (crushed rock or gravel) screened to sizes for various uses; see also distribution media; and treatment media.

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aggregation

See soil structure.

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air

Colorless, odorless, and tasteless gaseous mixture of nitrogen (78%), oxygen (21%) and trace amounts of other gases.

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air blower

Device that uses a fan to deliver air to a component; does not substantially compress air.

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air compressor

Device that delivers pressurized air to a component.

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air lift circulation

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air lift pump

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air lift skimmer

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air line

Piping that conveys air from the source to the point of diffusion.

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air lock

1. Condition in a pressurized distribution system where the presence of air or other gases prevents flow; 2. condition where air or other gases collect at a high point in a gravity distribution system and prevent or restrict flow.

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air pump

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air release

Allowing air to escape during pressurization of a distribution system using an air/vacuum relief valve.

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air relief

Process of venting air from a component.

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air source

Device which supplies air to a treatment process.

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air/vacuum relief valve

valve that allows air in the lines to be purged during pressurizing flow and allows air to enter during depressurized flow.

alarm

Device that provides information on the status of a component using a visual and/or audible device; can either be on site or remotely located.

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alarm activation volume

Volume between ‘pump on’ level and ‘alarm on’ level in a demand dosing configuration.

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alarm counter

Device used to record the number of times an alarm has been activated.

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alluvial

Pertaining to processes or materials associated with transportation or deposition of sediment by water.

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alluvial soil

1. Soil developing from sediments (alluvium) recently deposited by running water of streams and rivers and exhibiting essentially no horizon development or modification of the recently deposited materials; 2. wWhen capitalized, it refers to a great soil group of the azonal order consisting of soils with little or no modification of the recent sediment in which they are forming.

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alluvium

Uncosolidated sediments deposited by running water of streams and rivers; may occur on terraces well above present streams, on the present flood plains or deltas, or as a fan at the base of a slope; see also colluvium

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alteration

Modification of a wastewater treatment system on the basis of: an increase in the volume of permitted flow; a change in the nature of permitted influent; a change from the planning materials approved by the permitting authority; a change in construction; or an increase, lengthening, or expansion of the treatment or dispersal system.

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alternating drainfield

See alternating soil treatment area (STA).

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alternating soil treatment area (STA)

Final treatment and dispersal component that is comprised of multiple soil treatment areas which are independently dosed.

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alternating valve

See switching valve.

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alternative onsite wastewater treatment system

Onsite wastewater treatment system that is not a conventional system as described by local regulatory code.

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alternative sewage collection system

System of piping and other appurtenances consisting of service lines, small diameter variable grade effluent sewers (STEG or STEP), pressure sewers (grinder basins or ejector pumps) and vacuum sewers that receive and convey wastewater.

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aluminum hydraulic shoring

Pre-engineered shoring system comprised of aluminum hydraulic cylinders (cross braces) used in conjunction with vertical rails (uprights) or horizontal rails (wales); designed specifically to support the sidewalls of an excavation and prevent cave-ins.

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amended layer system

Engineered treatment and dispersal system in which native material is excavated and replaced with media targeting removal of specific contaminants.

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ammonia nitrogen (NH3)

Non-ionized form of reduced nitrogen.

ammonification

Biochemical process whereby ammonium nitrogen (NH_4^+) is release from nitrogen-containing compounds.

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ammonium nitrogen (NH4+)

Ionized form of reduced nitrogen usable by plants.

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amperage

The strength of an electric current measured in amperes. The amount of electric current flow, similar to the flow of water in gallons per minute.

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anaerobic

Absence of molecular oxygen (O_2) as a part of the environment, or a biological process that occurs in the absence of molecular oxygen; bound oxygen is present in other molecules, such as nitrate (NO_3^-) sulfate (SO_4^+) and carbon dioxide (CO_2); see also aerobic and anoxic.

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anaerobic bacteria

Bacteria that can metabolize in the absence of molecular oxygen.

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anaerobic treatment

Dgestion of organic matter in an environment without molecular (or dissolved) oxygen (O_2).

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anaerobic upflow filter

Media filter through which wastewater flows from a lower to a higher elevation; usually characterized by an anaerobic environment.

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angular blocky

See blocky.

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anoxic

Condition of low dissolved molecular oxygen (anaerobic) with presence of bound oxygen in nitrate form; conditions in a septic tank are generally anaerobic, but not anoxic; see also aerobic, anaerobic and denitrification.

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anthric saturation

Variation of episaturation associated with controlled flooding, which causes a reduced environment in a soil layer and oxidation of mobilized iron and manganese in a deeper unsaturated subsoil; see also endosaturation and episaturation.

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anti-siphon device

Variation of episaturation associated with controlled flooding, which causes a reduced environment in a soil layer and oxidation of mobilized iron and manganese in a deeper unsaturated subsoil; see also endosaturation and episaturation.

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appurtenance

Devices, machinery, appliances, or auxilliary structures attached to a main structure to enable it to function but not considered an integral part of it.

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aquic conditions

Continuous or periodic saturation and reduction indicated by redoximorphic features and verified by measuring saturation and reduction of the soil.

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aquic moisture regime

Soil moisture regime nearly free of dissolved oxygen due to saturation by groundwater or its capillary fringe and occurring during periods when the soil temperature 50 cm (20 inches) below the surface is greater than 5°c (41°f).

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aquifer

Geologic formation, group of formations, or part of a formation that is saturated and sufficiently permeable to transmit water.

aquifer storage

areal loading rate

Quantity of liquid applied to the footprint of the soil treatment area (or the absorption area of an above-grade soil treatment area) in a time interval, expressed as volume per unit time per unit area, e.g., gallons per day per square foot (gpd/ft^2).

as-built drawing

Construction document that is the approved design with red-line notations by the installer that reflect all modifications, substitutions and deviations made during the construction process. See also record drawing.

aspirator

Device which moves fluid (liquid or gas) by developing a vacuum.

assimilation

Donversion of absorbed wastewater constituents into living tissue.

assumed benchmark

Temporary benchmark used as a reference; typically assigned an elevation of 100.00 feet.

ASTM

American Society for Testing and Materials

ASTM C-33

Published standard from the American Society for Testing and Materials that provides specifications for clean sand used in various engineering and construction applications.

at-grade

Above-grade soil treatment area designed and installed such that some part of the infiltrative surface is located at the original ground elevation using suitable imported soil material for fill; excavation is 0 to 6” into native soil; utilizes gravity, pressure-dosed gravity or low-pressure distribution with the orifices of the distribution pipe above the original ground elevation; cover of suitable soil stabilizes the final grade, supports vegetative growth and sheds runoff; see also above-grade, below-grade and trench, shallow.

attached growth process

See fixed-film process.

authorization for construction

Approval to begin the system installation process.

average

Sum of individual measurements taken during a given period divided by the total number of measurements taken during the same period.

average daily flow

Average volume of wastewater in a 24-hour period; calculated from values measured over a period (e.g., week, month, year, etc.).

average daily volume

Volume dosed within a 24-hour period using a flow-equalization configuration.

axial pump

Centrifugal pump that incorporates an impeller that resembles a propeller and is used for pumping treated effluent or clean water; less useful for raw wastewater or sludge because the tight tolerances of the impellers cannot easily handle solids or stringy material.

back siphonage

Form of backflow which occurs because of negative pressure; see also backflow; anti-siphon device.

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back slope

The hillslope position that forms the steepest, and generally linear, middle portion of the slope. In profile, backslopes are bounded by a convex shoulder above and a concave footslope below; may or may not include cliff segments (i.e., free faces).

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backfill

1. Material placed in an excavation; 2. To place material in an excavation; 3. portion of an excavation above the haunch zone; for straight-walled tanks or structures, that portion of an excavation above the bedding.

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backflow

Reverse direction of flow, with liquid returning to the source.

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backflow prevention device

Any device, method, or configuration used to prevent a reversal of flow.

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backflush

To reverse the direction of flow to clean laterals; see also backwash.

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backsight (BS or +)

Rod reading taken on a point of known or assumed elevation (where establishing the first benchmark, usually assumed as 100.00); the backsight reading is added to the elevation to determine the height of instrument (HI); see also height of instrument (HI).

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backwash

To reverse the direction of flow through a filter, ion exchange column, or membrane for cleaning purposes; see also backflush.

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bacteria

Unicellular microorganisms that are ubiquitous, living in the human gut as well as aquatic and terrestrial habitats; beneficial species aid in human digestion and biological wastewater treatment; pathogenic species are a constituent of concern in biological wastewater treatment systems.

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baffle

Physical barrier placed in a component to dissipate energy, direct flow, retain solids and fog, and/or draw water from a specific depth.

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baffle wall

Typical feature of a two-compartment septic tank consisting of a wall with a physical opening or pipe configuration used to retain solids in the first compartment.

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ball check valve

Non-return valve in which a ball sits within a cylindrical fluid line.

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ball valve

Valve with the closing and opening mechanism formed in the shape of a ball with a hole; rotating the ball orients the hole so that it is either parallel to the flow, allowing unrestricted passage of fluid or perpendicular to the flow, shutting it off.

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basal area

Total area of an above-grade soil treatment area (mound, modified mound, or areal fill) including the absorption area; perimeter is measured at the interface of imported fill material and original grade; see also absorption area and infiltrative surface; see diagram at absorption area.

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base slope

Geomorphic component of hills consisting of the concave to linear slope (perpendicular to the contour) which, regardless of the lateral shape is an area that forms an apron or wedge at the bottom of a hillside dominated by colluvial and slope wash processes and sediments (e.g., colluvium and slope alluvium); see also head

slope, side slope, nose slope.

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basin

Watertight structure or container used to store wastewater for dosing to downstream components or retain effluent for specific treatment processes

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batch process

Configuration in which flow is controlled so that effluent is neither entering nor leaving the treatment component while a specific operation is being performed; see diagram at sequencing batch reactor.

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batch reactor

Reactor in which flow is neither entering nor leaving.

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bed

Below-grade soil treatment area consisting of an excavation greater than three feet wide containing distribution media and more than one lateral; typically installed in an excavation 18 to 36 inches below original ground elevation; utilizes pressure or gravity distribution; a cover of suitable soil stabilizes the final grade, supports vegetative growth and sheds runoff; see also trench.

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bedding

1. Process of laying piping, conduit or other structure in a trench shaped to the appropriate contour; 2. Tamping earth around piping, conduit, or other structure to provide support; 3. Material placed under piping, conduit, tank, or other component for uniform structural support.

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bedrock

General term for the rock that underlies the soil and other unconsolidated material or any rock strata that is exposed at the surface.

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bell

Device used to trap air in a submerged environment.

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bell vent

Device in a siphon used to introduce air into the siphon bell and stop a dosing event.

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bell-bottom pier hole

Type of shaft or footing excavation, the bottom of which is made larger than the cross section above to form a belled shape.

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below-grade system

Soil treatment area designed and installed such that the infiltrative surface and most of the sidewall are below the original ground elevation; a cover of suitable soil stabilizes the final grade, supports vegetative growth and sheds runoff; see also above-grade and at-grade.

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bench

1. Soil placed downslope of an excavation to create a level surface on which to work; 2. Shallow excavation adjacent to a deeper excavation (such as for a tank or advanced treatment component) that allows placement of associated piping on undisturbed soil.

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bench level

Surveying with a level to establish elevations on benchmarks; usually run as part of a cross section, profile, or topographic survey.

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benching

Method of protecting workers from cave-ins by excavating the sides of an excavation to form one or a series of horizontal levels or steps, usually with vertical or near-vertical surfaces between levels to reduce the height of vertical cuts and stabilize the excavation.

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benching system

Method of protecting employees from cave-ins by excavating to form one or a series of horizontal levels or steps, usually with vertical or near-vertical surfaces between levels in accordance with OSHA safety standards for protective systems.

benchmark

A stationary object of previously determined position and elevation and used as a reference point.

benchmark (BM)

Reference point of known elevation; a permanent bench mark can be established with a brass pin or cap set in concrete, a long metal stake driven in the ground, or a specific point on a concrete bridge or other solid object; a temporary bench mark (needed for only a few days or weeks until a job is completed) could be a wooden stake driven in the ground, or a nail driven in a tree or post; for many temporary bench marks the elevation may be assumed (usually 100.00 feet); permanent bench mark locations should be accurately described in the field book so that a person who had never been to the area could find them.

bentonite

An absorbent swelling clay consisting mostly of montmorillonite which can either be Na-montmorillonite or Ca-montmorillonite.

berm

1. Natural or constructed raised drainage feature used to divert runoff of stormwater and direct the flow to an effective outlet; may be used in conjunction with a swale; 2. Raised earthen structure designed to contain wastewater such as in a lagoon; see also swale.

biochemical loading rate

Quantity of BOD_5 delivered to a treatment component expressed as mass per time (e.g., pounds of BOD_5 per day).

biochemical oxygen demand (BOD)

Amount of oxygen required by bacteria while stabilizing, digesting, or treating wastewater under aerobic conditions; an indirect measure of the amount of organic matter in wastewater; a measure of the relative strength of wastewater expressed in mg/L.

biofilm

Thin coating of microbial growth, organic matter, and microbial secretions on a solid substrate particle.

biofilter

Media filter in which the media used is biological in origin (i.e., peat or coir).

biogas

Naturally occurring gas that is generated by the breakdown of organic matter by anaerobic bacteria.

biological loading rate

Quantity of organic matter delivered to a treatment component expressed mass per time (e.g., pounds per day).

biological nutrient removal (BNR)

Use of microbiological activity for removal of nitrogen and phosphorus in a wastewater treatment system.

biological treatment

Metabolic activities of bacteria and other microorganisms that convert complex organic materials into simpler, more stable substances.

biological unit processes

Treatment methods in which the removal or conversion of constituents is brought about by biological activity; primarily used to remove the biodegradable organic constituents through conversion to cell tissue or gases; also used to remove nutrients (nitrogen and phosphorus).

biomass

Total mass of living organisms.

biomat

Layer of biological growth and inorganic residue that develops at the infiltrative surface.

biosolids

Dewatered, primarily nutrient-rich organic material generated as a by-product of biological wastewater treatment processes that can be recycled (such as for use as a soil amendment); see also residuals and septage.

biozone

Soil or fill material which removes pollutants from treated effluent by processes which include physical filtration of bacteria and other constituents, adsorption of viruses and bacteria by clay and organic matter, biological destruction of pathogens by soil microorganisms, sorption or precipitation of phosphorus, biochemical transformations of organic and nitrogen compounds, and biological assimilation of phosphorus and nitrogen.

blackwater

Portion of the wastewater stream that originates from toilet fixtures, dishwashers, and food preparation sinks; see also graywater.

bleed

To drain a liquid or gas, as in bleeding accumulated air from a water line or bleeding (draining) a trap of accumulated water.

block

Device constructed of resilient material (such as concrete) and placed beneath a pump in order to raise the pump intake elevation.

blocky

Soil structure descriptor for soil aggregates with blocklike shapes; includes angular blocky (exhibiting sharp, well-defined edges) and subangular blocky (exhibiting more rounded edges).

BOD5

See five-day biochemical oxygen demand.

boot

Flexible device attached to piping to provide a watertight seal.

bottom feed manifold

Configuration in which a short manifold is located at the lower elevation of a soil treatment area.

bottomless media filter

Media filter that does not incorporate a liner or other physical barrier between the media and the existing soil on which it has been placed; used as a final treatment and dispersal component.

building sewer

Service line piping that collects and conveys wastewater from the source to further collection and storage, treatment and dispersal components; includes access for maintenance such as cleanouts.

bulking

Condition wherein sludge solids do not separate from the liquid under quiescent conditions; under aerobic conditions may be associated with the growth of filamentous organisms, low dissolved oxygen (DO), or high sludge loading rates; under anaerobic conditions, may be associated with attachment of gas bubbles to solids.

Bull-run® valve

See switching valve.

bundled pipe

Distribution media consisting of two or more conjoined perforated pipes.

buoyancy

Tendency of a body to float in water or other liquid; upward force that a fluid exerts on an object that is less dense than itself.

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buoyancy valve

See recirculating splitter valve.

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buried single pass sand filter

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bury depth

Depth from the surface of the finished grade to the top of a component.

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capilary action

Attraction (cohesion of liquid molecules and adhesion between a liquid and a solid surface) resulting in movement of liquid from a zone of greater liquid content to an area of lesser liquid content.

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capillary force

Attraction (adhesion) of liquid to a solid surface.

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capillary fringe

A zone in the soil just above the plane of zero water pressure (water table) that remains saturated or almost saturated with water due to capillary action that draws water upward.

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carbonaceous biochemical oxygen demand (cBOD)

Quantitative measure of the amount of oxygen consumed by bacteria while stabilizing, digesting, or treating the organic matter under aerobic conditions over a five-day incubation period while in the presence of a chemical inhibitor to block nitrification; cBOD is expressed in milligrams per liter (mg/L); see also nitrogenous biochemical oxygen demand; and nitrification.

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cargo tank

Enclosed space (tank) mounted on a truck, trailer, or skid which is intended to receive and contain material for transport from the source facility to the receiving facility.

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cargo tank baffle

One or more partitions installed across the shortest dimension of a cargo tank that partially restrict the free flow of liquid from end to end in the tank; designed to reduce liquid surge and increase vehicle handling safety.

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cathodic protection

An electrical system for prevention of rust, corrosion, and pitting of steel and iron surfaces in contact with Water, wastewater or soil. A low-voltage current is made to flow through a liquid (water) or a soil in contact with the metal in such a manner that the external electromotive force renders the metal structure cathodic. This concentrates corrosion on auxiliary anodic parts which are deliberately allowed to corrode instead of letting the structure corrode.

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cave-in

Separation of a mass of soil or rock material from the side of an excavation, or the loss of soil from under a trench shield or support system, and its sudden movement into the excavation, either by falling or sliding, in sufficient quantity so that it could entrap, bury, or otherwise injure and immobilize a person.

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cavitation

The formation and collapse of a gas pocket or bubble on the blade of an impeller or the gate of a valve; the collapse of this gas pocket or bubble drives water into the impeller or gate with a terrific force that can cause pitting on the impeller or gate surface; accompanied by loud noises that sound like someone is pounding on the impeller or gate with a hammer.

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center feed manifold

Configuration in which a long manifold is installed perpendicular to two sets of distribution laterals that extend in opposite directions along the contour; the supply line may connect to the manifold in the center or at one end; used on level or nearly-level sites.

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centralized management

centralized wastewater treatment

centrifugal pump

Pump consisting of a rotating vane(s) [impeller(s)] enclosed in a housing (volute); the impeller draws liquid in and discharges it from the pump under pressure.

certificate of completion

Documentation of the proper construction of the system.

certification

Program to substantiate the capabilities of personnel by documentation of experience and learning in a defined area of endeavor.

cesspit

See cesspool.

cesspool

Underground pit into which raw household wastewater is discharged and from which the liquid seeps into the surrounding soil; may or may not be partially lined; if septic tank effluent is discharged to such a component, it is considered a seepage pit; emphasis is on disposal rather than treatment, resulting in this technology being phased out.

chain trencher

See trencher.

chamber

1. An enclosed structure or container used for treatment or storage of effluent in an onsite wastewater treatment system; may be free-standing or integral with another structure 2. Pre-formed, manufactured distribution media with an open-bottom configuration; used in soil treatment areas.

check valve

Valve that allows flow in only one direction by closing when the flow direction reverses.

chemical oxygen demand (COD)

Amount of the organic matter in wastewater that can be oxidized by a very strong chemical oxidant; typically measured by a standard test using dichromic acid as the oxidant.

chemical toilet

Waterless toilet with a tank that contains a chemical to limit decomposition of non-water-carried human waste during storage prior to offsite treatment.

chemical treatment

Process involving the addition of chemicals to obtain a desired result, such as precipitation, coagulation, flocculation, pH adjustment, disinfection, or sludge conditioning.

chemical unit processes

Treatment methods in which the removal or conversion of constituents is brought about through the addition of chemicals or by other chemical reactions; includes precipitation, adsorption and disinfection.

chisel plow

1. Shank tillage implement that disrupts the soil to loosen and roughen the surface 2. Static plow shank used to slice the soil during installation of subsurface drip tubing.

chloramine

chemical compound present because of the chlorine disinfection process when the effluent contains ammonia; chloramines are relatively persistent in the environment and toxic to fish and amphibians.

chlorination

see disinfection, chlorine.

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chlorinator

component that delivers chlorine (liquid, tablet, or gas) as an agent for disinfection.

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chlorine

term commonly used to describe a chlorine source such as sodium hypochlorite, a highly reactive chemical used as a disinfectant and oxidizing agent.

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chlorine disinfection

process used to inactivate microorganisms by the addition of chlorine (such as in the form of sodium hypochlorite); see also chlorinator and chlorine.

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chlorine residual

total amount of chlorine (free and combined available forms) remaining in effluent at the end of a specified contact period after the chlorination process.

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chroma

relative purity, strength, or saturation of a color; directly related to the dominance of the determining wavelength of the light and inversely related to grayness; one of the three variables of color; see also Munsell Color System; hue; and value.

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circuit breaker

A protective device that automatically interrupts electrical flow when excessive current is detected, preventing damage to itself or wiring or creating hazardous conditions

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circulation ratio

Total volume of effluent dosed to the treatment unit relative to the volume of forward flow to the next component of the treatment train; calculated by dividing the total dosed volume by the forward flow volume (total dosed volume / forward flow volume); see also recirculation ratio and forward flow.

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clarification

Process or combination of processes that uses separation (settling and flotation) to remove suspended solids from wastewater.

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clarification chamber

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clarifier

Component or tank that uses separation to remove suspended solids from wastewater.

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clay

1. Soil separate consisting of particles <0.002 mm in equivalent diameter; 2. in reference to clay mineralogy, a naturally occurring material composed primarily of fine-grained minerals, which is generally plastic at appropriate water content and will harden when dried or fired; see also soil separate, soil textural class and soil texture.

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cleanout

device designed to provide access for removal of deposited or accumulated materials, generally from a pipe.

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clear wastewater

See clear water.

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clear water

Fraction of the wastewater stream including, but not limited to surface water, groundwater, condensate, ice machine drainage, and/or discharge from swimming pools, hot tubs, and water treatment devices; see also wastewater.

clear zone

Volume or zone within a component that contains clarified wastewater; for example, after wastewater has had sufficient detention time in a septic tank, the clear zone lies between the scum and sludge layers.

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clogging mat

See biomat.

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cluster system

See cluster wastewater treatment system.

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cluster wastewater treatment system

Wastewater treatment systems designed to serve two or more sewage-generating dwellings or facilities with multiple owners; typically includes a comprehensive, sequential land-use planning component and private ownership.

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coagulation

Process by which colloidal particles come together irreversibly to form larger masses.

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coarse bubble

Bubble of 3 to 8 mm diameter generated by an air diffuser.

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coarse fragments

See rock fragments

COD

See chemical oxygen demand.

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cohesive soil

A type of fine-grained soil, such as clay or silt, that has particles that stick together due to their attraction to each other; it is plastic when moist, meaning it can be easily molded, and it retains its shape well; categorized by OSHA as Type A or B, depending upon the compressive strength.

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coir

Fibrous organic material originating from coconut husks that may be used in a media filter.

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coir filter

Media filter that uses organic fibric material (coir) from outer husk of coconut as the media; typically packaged as pre-fabricated modular units of containerized media; a type of biofilter.

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coliform bacteria

Group of bacteria that constitute most of the intestinal flora of warm-blooded animals (including the genera Klebsiella sp., Enterobacter sp., Citrobacter sp., or Escherichia sp.) and are used as water pollution indicator organisms.

---

coliphage

Virus which uses coliform bacteria as its host cell; also known as a bacteriophage.

---

collection

---

collection system

See sewage collection system.

---

collector wastewater treatment system

See cluster wastewater treatment system.

---

colloids

Very fine solid particles (typically between 0.1 and .001 microns in diameter) which are suspended in a liquid or gas, do not settle out of solution, and cannot be removed by conventional filtration alone.

---

colluvium

Unconsolidated, unsorted earth material being transported or deposited on sideslopes and/or at the base of slopes by mass movement (e.g., direct gravitational action); see also alluvium.

---

colony-forming unit (CFU)

Term used to report the estimated number of live non-photosynthetic bacteria in a water sample; see also coliform bacteria, fecal; coliform, total (TC); and heterotrophic plate count.

---

color

See Munsell Color System.

---

columnar

Soil structure descriptor for soil aggregates with vertically elongated columns with a distinct rounded cap.

---

combined available chlorine

Chlorine that is combined with ammonia in wastewater to form chloramines; although they are slow-reacting, chloramines also serve as disinfectants.

---

combined treatment and dispersal

A subset of integrated treatment and dispersal systems that bear American National Standards Institute (ANSI) accreditation and consist of proprietary distribution media installed in a sand layer meeting manufacturer specification for quality (some variation of ASTM C-33 sand criteria) and depth.

---

commercial kitchen

Food preparation center that prepares multiple meals or food products and typically generates high-strength wastewater; see also wastewater, high-strength.

---

commercial wastewater

Non-toxic, non-hazardous wastewater from commercial establishments, including but not limited to commercial food preparation operations, that is similar in composition to domestic wastewater, but which may have one or more of its constituents exceed typical domestic ranges.

---

community wastewater treatment system

Publicly owned wastewater treatment system for collection, treatment and dispersal of wastewater from two or more lots, or two or more equivalent dwelling units.

---

compaction

Rearrangement of soil grain particles that decrease void space and result in the degradation of soil structure and/or water infiltrative capacity.

---

compartment

Space created by a physical partition within a pretreatment component.

---

compensation

In accordance with OSHA standards, one who is capable of identifying existing and predictable hazards in the surroundings, or working conditions which are unsanitary, hazardous, dangerous to employees, and who has authorization to take prompt corrective measures to eliminate them; see also qualified person.

---

complete mix reactor

See continuous-stirred tank reactor.

component

Subsection of a treatment train or system; a component may include multiple devices; see also part and device.

---

composite sample

Commingled individual samples collected from the same point at different times; samples may be of equal volume or may be proportional to the flow at time of sampling.

---

composting toilet

Self-contained waterless toilet designed to decompose non-water- carried human wastes through microbial action on a carbon source and store the resulting matter for further treatment and reuse/disposal.

---

concave slope

Landscape form or feature that is curved or rounded inward such as a segment of the interior of a hollow sphere; slope becomes progressively flatter as one travels downslope.

---

concrete

Artificial construction material prepared by mixing a binding material (cement or lime), fine aggregate (sand), coarse aggregate (stone chips, brick chips or gravel), and water in proper proportion

---

condensation

Deposition of a liquid or a solid from its vapor, generally upon a surface that is cooler than the adjacent gas

---

condition-based maintenance

Proactive maintenance strategy that includes monitoring equipment condition in real-time using sensors and diagnostics; maintenance is triggered based on the actual condition of the asset, rather than a pre-set schedule.

---

confining layer

Impermeable or low-permeability geological formations that restruct groundwater movement, acting as barriers between aquifers.

---

consistence

See soil consistence.

---

constructed wetland

Treatment component that mimics the processes that occur in natural wetlands to renovate wastewater using submerged flow or free water surface configurations and vegetation typically adapted for life in saturated soil conditions.

---

construction

Activities related to the installation, alteration, extension, or repair of a wastewater treatment system, including all activities from disturbing the soils through connecting the system to the building or property served by the wastewater treatment system.

---

construction survey

Survey used to locate structures and provide required elevation points during their construction.

---

construction zone

Physical area occupied by personnel, equipment, and materials during the installation, alteration, extension, or repair of a wastewater treatment system; see also limit of disturbance.

---

contact basin

See contact chamber.

---

contact chamber

Tank or compartment where treated effluent mixes with a disinfecting agent; designed to provide sufficient retention time for disinfection to occur.

---

contact time

Time during which a chemical or constituent is in contact with another reacting chemical or constituent such as during chlorine, ozone, or UV disinfection.

---

contaminant

Organic or inorganic constituent in suspended or dissolved form that constitutes an impurity targeted for removal from a liquid or solid substrate to facilitate renovation or beneficial use of the treated substrate.

---

continuous process monitoring

Real-time data recording of process information, including equipment condition and process parameters to identify deviations from normal operation; see also *condition-based maintenance* and *predictive maintenance*.

---

continuous stirred tank reactor (CSTR)

Reactor in which complete mixing occurs; constituents entering the tank are immediately and evenly dispersed throughout the tank while chemical and biological reactions take place.

---

contour

Multiple points on the land surface that are of equal elevation.

---

contour interval

Vertical distance between level surfaces forming the contours.

---

contour line

Line drawn on a map that connects points having the same elevation.

---

contour loading

Movement of liquid dispersed into the receiving environment through the window of acceptance at the downslope edge of the soil treatment area

---

contour loading rate

Cumulative total of effluent applied to the soil profile at the down gradient end of a dispersal system installed on a slope in a time interval, expressed as volume per unit length per unit time along the contour (e.g., gpd/ft-d).

---

contour map

Map consisting of contour lines that illustrate the irregularities of the land surface; also known as a topographic map.

---

contractor-assembled

Built or put together by the entity who is installing a system; see also manufacturer-assembled.

---

control panel

Component that contains electrical devices that provide information on system operation and may allow adjustment of settings for operation of electrical devices.

---

controls

Group of sensors that provide information on and allow adjustment of system settings.

---

conventional system

Refers to a typical onsite wastewater treatment system (OWTS) as defined at the local or regional level; see also wastewater treatment system, onsite.

---

conventional trench

Soil treatment area (STA) configuration consisting of a trench excavation of 3 feet or less using washed rock as the distribution media and containing a single lateral

convex slope

Landscape form or feature that has a surface that is curved or rounded outward; slope becomes progressively steeper as one moves downslope.

---

corrosion

1. Condition in which the surface of a component is chemically degraded; 2. condition in which the surface of a concrete component is chemically degraded (dissolving) exposing aggregate and/or structural reinforcement materials; see also spalling.

---

cover

Specific material placed over system components.

---

crest

The commonly linear, narrow top of a ridge, hill, or mountain; appropriately applied to elevated areas where retreating backslopes are converging such that these high areas are almost exclusively composed of convex shoulders

---

cross braces

Horizontal members of a shoring system installed perpendicular to the sides of the excavation, the ends of which bear against either uprights or wales.

---

cross section

Vertical section of the surface of the ground at right angles to a base line or center line; side view of a cutaway of the earth's surface.

---

cross-over pipe

Non-perforated pipe used in serial or sequential distribution to connect a series of trenches at the same elevation; see also stepdown and relief device.

---

crown

Preferred configuration of the final grade over onsite wastewater treatment system components intended to ensure that surface water is diverted

---

curtain drain

See interceptor drain.

---

cut and fill

Process of using excavated material removed from one location as fill material in another location on the same site.

---

cut-off nipple

See universal riser

---

cut-off nipple riser

Polyethylene fitting used to connect spray distribution heads to laterals, allowing placement of the distribution head at the soil surface via multiple threaded sections that can be cut to the appropriate length.

---

cutwater

Portion of the volute that extends closest to the impeller of a centrifugal pump; shears the circulating liquid or gas and directs flow towards the discharge.

---

cycle counter

Device used to record the number of times a component or device has been activated (e.g., activation of a pump followed by deactivation is one cycle).

D-box

See distribution box.

---

daily design flow

Estimated volume of wastewater for any 24-hour period; parameter used to size systems.

---

daily flow

Measured volume of wastewater generated from a facility in a 24-hour period; expressed as a volume per day.

---

datum

Level surface to which elevations are referenced; for example, mean sea level.

---

daylight

Come to grade, as with drainage piping.

---

decant

1. Fifth step in the sequential treatment processes that occur in a sequencing batch reactor (SBR). 2. Act of transferring effluent slowly so as to separate liquid from solid after a previous settling process.

---

decentralized management

---

decentralized wastewater treatment system

Wastewater treatment system for collection, treatment, and dispersal/reuse of wastewater from multiple homes, isolated communities, industries, or institutional facilities, at or near the point of waste generation.

---

dechlorination

Removal of the free and combined chlorine residual to reduce the potentially toxic effects of chlorinated effluents.

---

deep aquifer

---

deep bed

Bed installed in an excavation greater than 36 inches deep.

---

deep trench

Trench installed in an excavation greater than 36 inches deep.

---

deflection

Any change in the inside diameter of piping resulting from installation and imposed loads; deflection may be either vertical or horizontal and is usually reported as a percentage of the base (undeflected) inside piping diameter.

---

delivered dose volume

Net amount of effluent applied to a component in a dose or unit time; includes the dose volume minus drainback volume and pipe fill volume; see also dose volume; drainback volume and pipe volume.

---

demand dosing

Configuration in which a specific volume of effluent is delivered to a component based upon patterns of wastewater generation from the source.

---

denitrification

Biochemical reduction of nitrate (NO_3^-) or nitrite (NO_2^-) to gaseous molecular nitrogen (N_2) or an oxide of nitrogen.

---

deodorizer

Concentrated scented liquid introduced to the exhaust air at the muffler or into the vacuum pump oil reservoir to reduce odors.

---

depressurized flow

Portion of a dosing event during which the distribution system is draining.

---

design

1. Process of selecting, sizing, locating, specifying, and configuring treatment train components that match site characteristics and facility use as well as creating the associated written documentation; 2. Written documentation of size, location, specification and configuration of a system.

---

design flow

Estimated volume of wastewater per unit of time for which a component or system is designed.

---

designer

Service provider who creates plans for the installation, alteration, extension, or repair of a wastewater treatment system; see also service provider.

---

detention time

Average length of time a unit volume of wastewater or a suspended particle remains in a tank or chamber; mathematically, it is the volume of water in the tank divided by the flow rate through the tank (assuming ideal hydraulic conditions).

---

detritus

A loose mass of decaying material.

---

device

Subunit of a component; a component often includes multiple devices; see also part and component.

---

dewatering

1. To partially remove water from a slurry; 2. To remove water from a basin, tank, reservoir, or other storage unit; 3. To remove water from a site to facilitate construction and installation of components.

---

diameter

A chord passing through the center of a figure or body

---

diaphragm valve

Valve employing a stem that depresses a diaphragm (membrane) to control flow.

---

differential leveling

Method of leveling used to find the difference in elevation (vertical distance) between two points.

---

diffused aeration

Process of introducing air into a treatment component or process through a diffuser using a compressor or blower.

---

diffuser

Part or device that injects air under pressure into liquid (e.g., submerged porous plate, perforated pipe, or orifice).

---

digestion

---

direct injection

---

directional boring

Directional boring, also referred to as horizontal directional drilling, is a minimal impact trenchless method of installing underground utilities such as pipe, conduit, or cables in a relatively shallow arc or radius along a prescribed underground path using a surface-launched drilling rig.

---

disc filter

Device consisting of concentrically grooved discs stacked one upon the other and used for removal of particles larger than a specific size; typically used in drip distribution systems.

---

discharge assembly

All piping and parts between the point of pump discharge to the point at which the supply line exits a dosing tank or punmp tank.

---

discharge vent

Air relief device in a sipon dosing configuration consisting of piping that allows air to enter and exit as needed for proper component function

---

disinfection

Physical or chemical process used to destroy or inactivate pathogenic microorganisms in wastewater to render them non-infectious; see also disinfection, chlorine; disinfection, ozone; and disinfection, ultraviolet (UV).

---

dispersal

Spreading of effluent over and into the final receiving environment.

---

dispersion

1. Scattering and mixing; 2. Repellant action of an electric potential on fine particles in suspension in water, as in a stream carrying clay.

---

disposal

---

dissolved oxygen (DO)

Amount of molecular oxygen (O_2) dissolved in water, wastewater, or other liquid; commonly expressed as a concentration in milligrams per liter (mg/L), parts per million (ppm), or percent of saturation.

---

dissolved solids

That portion of total solids that passes through a filter of 2.0 µm (or smaller) nominal pore sized under specified conditions.

---

distributed management

---

distribution

Process of conveying wastewater or effluent to one or more components or devices.

---

distribution box

Level, watertight structure that receives septic tank effluent and distributes it via gravity in approximately equal portions to two or more trenches or two or more laterals in a bed.

---

distribution device

Device that receives effluent from one component, and conveys it to a subsequent component(s), (e.g., a distribution box, drop box, or manifold).

---

distribution lateral

See lateral.

---

distribution media

Media used to provide void space (usually in a dispersal component) through which effluent flows and is stored prior to infiltration (e.g., washed rock, aggregate, polystyrene blocks or beads, chambers, pipe, etc.).

---

distribution system

Entire network of components that transport wastewater or effluent within a system.

distribution uniformity

Relative variability of effluent delivery over an infiltrative surface.

---

diversion valve

See switching valve.

DO

Dissolved oxygen.

---

domestic wastewater

Water or liquid-carried waste from plumbing fixtures, appliances and devices such as toilets, bath, laundry, and dishwashers; see also, residential-strength wastewater.

---

dose

See dosing event or dose volume.

---

dose cycle

Period between the initiation of one dosing event and the next; the period includes both the time “on” and the time “off”.

---

dose volume

1. Amount of effluent delivered to the distribution system during a dosing event including the drainback volume, pipe fill volume and the delivered dose volume;
2. Amount of effluent delivered as determined by the pump on and pump off levels in a demand dosed system.

---

dosing chamber

See dosing tank.

---

dosing event

Occurrence of effluent delivery after a rest period.

---

dosing tank

Tank or compartment which provides storage of effluent and contains a device (pump or siphon) and associated appurtenances used to convey effluent to another treatment process or a final treatment and dispersal component; see also pump tank and siphon tank.

---

down-gradient

1. Direction water flows by gravity; 2. Location down-slope.

---

drain tile

Terracotta or perforated plastic piping or other conduit that is used as part of a drainage system.

---

drain valve

Valve that allows drainage of a distribution system.

---

drainage

Network of natural or artificial groundwater or surface water features including agricultural drain tile, cut banks, and ditches which intercept and divert surface water and/or lower groundwater.

---

drainage class (natural)

Group of soils defined by frequency and duration of wet periods similar to those under which the soil developed.

drainback

Backflow of effluent into a pump tank after pump operation ceases during a dosing event; see also drainback volume.

drainback volume

Amount of effluent that flows back into a pump tank after pump operation ceases during a dosing event.

draindown

Movement of effluent out of a lateral by infiltration into the soil treatment area following a dosing event.

drainfield

See soil treatment area.

drainline

1. Regarding collection of soil water to reduce saturation; see drain tile; 2. Regarding collection of effluent in the bottom of a media filter, see underdrain.

draw

Fourth step in the sequential treatment processes that occur in a sequencing batch reactor (SBR).

drawdown

Drop in the liquid level of a tank as a result of some phase of operation.

drawdown test

Measurement of the drop in liquid level in a dosing tank measured over time to calculate dosing/delivery rate; may be expressed as a pump delivery rate (PDR) or siphon delivery rate.

drip dispersal

Application of effluent over a soil treatment area via tubing with flow regulating emitters, and associated devices and parts (including pump, filters, controls, and piping).

drip distribution

Pressurized distribution system that delivers small doses of treated effluent to an infiltrative surface through a network of piping, tubing with flow regulating emitters, and associated devices.

drip emitter

Drip distribution device that dispenses effluent to the infiltrative surface at a predictable rate; see also non pressure-compensating emitter, and pressure compensating emitter.

drip field

Above or below grade soil treatment area where final treatment and dispersal occurs via application of effluent to the infiltrative surface via pressurized drip tubing utilizing emitters; see also drip field, surface; drip field, subsurface; and drip tubing.

drip irrigation

System that is designed to apply liquid based on the needs of the receiving vegetation using drip distribution technology.

drip lateral

Length of drip tubing extending from the supply manifold to the return manifold.

drip line

See drip tubing.

drip tubing

Small diameter flexible plastic tubing manufactured with emitters uniformly spaced along its length; see also drip emitter.

drip zone

Component of a drip distribution system made up of a group of drip laterals that is managed as a single unit.

dripper loading

See instantaneous loading rate.

drop box

1. Device used for serial or sequential distribution of effluent by gravity flow to a lateral of a final treatment and dispersal component; addition of such a device adds a means of system management; 2. Device used to lower piping elevation.

dry soil

Soil that exhibits no visible signs of moisture content.

drywell

Partially lined underground pit (regardless of geometry) into which drainage from roofs, basement floors or other such sources is discharged and from which the liquid seeps into the surrounding soil; if effluent (such as that from a septic tank) is discharged to such a component, it is considered a seepage pit.

dual fields

See alternating drainfields.

dual manifold

Configuration in which the supply line is connected to a manifold at two points.

duplex pumps

duplex system

Control that operates two usually identical devices in a system (e.g., a duplex pump system).

duty point

Operating condition represented graphically as the intersection of the pump curve and system curve.

dwelling

Structure or building, or any portion thereof which is used, intended, or designed to be occupied for temporary or permanent human living purposes including, but not limited to: houses, houseboats, mobile homes, motor homes, travel trailers, hotels, motels, and apartments.

DWV (drain-waste-vent)

1. Piping assembly which facilitates the removal of liquid and solid wastes as well as the dissipation of sewer gases; 2. Pipe specified for use in the removal of liquid and solid wastes and for the dissipation of sewer gases.

dynamic head

Variable component of total dynamic head (TDH); comprised of friction head which fluctuates with piping diameter, system configuration, and flow rate; see also head, static; and head, total dynamic.

E. coli

See Escherichia coli.

effective capacity

See tank capacity.

---

effective depth

Depth of liquid below the head space in a tank; see also head space and operating level.

---

effective rainfall

Amount of precipitation that infiltrates and is held in surface storage.

---

effective size

Particle diameter of which 10 percent of the sample is finer by weight as determined by a sieve analysis; also known as D10.

---

effluent

Liquid flowing out of a component or device.

---

effluent filter

See effluent screen.

---

effluent quality

Physical, biological, and chemical characteristics of a liquid flowing from a component or device.

---

effluent screen

Removable, cleanable (or disposable) device installed on the outlet piping of a septic tank for the purpose of retaining solids larger than a specific size and/or modulating effluent flow rate.

---

ejector pump

Centrifugal pump that can (in addition to passing liquids) pass solids of a specific size in accordance with the diameter of the pump intake and discharges the resulting mixture under pressure to a subsequent system component.

---

elapsed time meter (ETM)

Device used to detect an electrical signal to measure and record the total length of time a component has been in the operation phase.

---

electrolysis

An external electrical current forcing metal corrosion in the presence of an electrolyte (such as salt water or moist air).

---

electrolytic corrosion

Corrosion that occurs when an external electrical current flows through a metal in the presence of an electrolyte (usually water containing dissolved salts or acids). This current causes metal atoms to lose electrons and dissolve as ions, leading to material degradation, especially at the point where the current leaves the metal (called the anodic area)

---

elevated system

Above-grade soil treatment area designed and installed such that the entire infiltrative surface is located above the original ground elevation using suitable imported soil material for fill; utilizes gravity, pressure-dosed gravity or low-pressure distribution; cover of suitable soil stabilizes the final grade, supports vegetative growth and sheds runoff; see also mound.

---

elevation

1. Height relative to a fixed point of known elevation such as sea level or a benchmark; 2. High place or position; 3. Drawing or diagram made by projection on a vertical plane; a two-dimensional drawing of the front, side, or back of a building.

---

elevation head

Component of total dynamic head (TDH) described as the difference in elevation between the lowest effluent operational level in the dosing tank and the discharge point; the sum of elevation head and operating pressure constitutes the static head component of total dynamic head (TDH).

emerging contaminants

Newly identified compounds or substances that have the potential to adversely affect public health or the environment and for which there is no currently published health standard; see also trace organic contaminants.

---

emulsification

Suspension of solids as a result of decreased surface tension due to the presence of an emulsifying agent or some substance that alters or prohibits normal microbial activity; see emulsifying agent.

---

emulsifying agent

Agent capable of modifying the surface tension of emulsion droplets to prevent coalescence; examples are soap and other surface-active agents, certain proteins and gums, water-soluble cellulose derivatives, and polyhydric alcohol esters and ethers; see also emulsification and emulsion.

---

emulsion

Heterogeneous liquid mixture of two or more liquids not typically dissolved in one another, but held in suspension by forceful agitation or by emulsifying agents that modify the surface tension of the droplets to prevent coalescence; see also emulsification and emulsifying agent.

---

endogenous respiration

Auto-oxidation by organisms in biological processes.

---

endosaturation

Condition in which the soil is saturated with water in all layers from the upper boundary of saturation to a depth of 200 cm or more from the mineral soil surface; see also anthric saturation and episaturation.

---

environmental sensitivity

Relative susceptibility of the natural environment to adverse impacts from an outside constituent.

---

episaturation

Zone of saturation held above the main groundwater body by a slowly-permeable layer, or by impermeable rock or sediment; see also anthric saturation; and endosaturation.

---

equivalent dwelling units (EDUs)

Units of measure that standardize all land use types (housing, retail, office, etc.) to the level of demand created by one single-family housing unit.

Escherichia coli (E. coli)

Member of the coliform bacteria group normally present in human and animal intestines; indicator organism for fecal contamination in water; see also coliform bacteria, fecal; coliform bacteria, total; and indicator organism.

---

estimated flow

Highest recorded flow occurring within a short, specific period (expressed in gallons per minute).

ET bed

See evapotranspiration bed.

ETA bed

See lined evapotranspiration bed.

ETI bed

See unlined evapotranspiration bed.

---

eutrophication

Nutrient enrichment of a lake or other water body typically characterized by increased growth of planktonic algae and rooted plants; can be accelerated by wastewater discharges and polluted runoff.

---

evaporation

Process by which an element or compound transitions from its liquid state to its gaseous state below the temperature at which it boils; in particular, the process by which liquid water enters the atmosphere as water vapour in the water cycle.

---

evaporation lagoon

lagoon where wastewater is stored and the water is allowed to evaporate over time.

---

evapotranspiration

Loss of water from the soil both by evaporation from the soil surface and by transpiration from the leaves of the plants growing on it. Factors that affect the rate of evapotranspiration include the amount of solar radiation, atmospheric vapor pressure, temperature, wind, and soil moisture.

---

evapotranspiration (ET) bed

Dispersal component with a continuous, impermeable bed liner that uses evaporation and transpiration for dispersal of effluent; sometimes called an evapotranspiration/adsorption (ETA) bed.

---

event counter

Device used to record the number of times a component or device has been activated or deactivated (e.g., pump activation is one event and pump deactivation is a second event).

---

excavation

Any man-made cut, cavity, trench, or depression in an earth surface, formed by earth removal.

---

exfiltration

Unintended/undesirable outflow of effluent from a component into the environment.

---

existing grade

Natural, unaltered land surface; also referred to as original ground surface.

---

expansion

Increasing the capacity of a wastewater treatment system.

---

expansive clay mineralogy

Soil in which the clay fraction is dominated by expansive 2:1 clay minerals such as smectite or vermiculite.

---

expansive soil

Soil that undergoes significant volume change upon wetting and drying, usually because of a high content of expansive clay minerals; see also expansive clay mineralogy.

---

extended aeration process

Wastewater treatment process that uses activated sludge to biologically convert non-settleable (suspended, dissolved, and colloidal) organic materials to a settleable product using aerobic and facultative microorganisms; typically followed by clarification and sludge return.

---

extension

Alteration of a wastewater treatment system resulting in an increase in capacity, lengthening, or expansion of the existing collection, treatment or dispersal component.

---

faces

Vertical or inclined earth surfaces formed as a result of excavation work; also known as sides.

facultative bacteria

Bacteria that can metabolize with or without molecular oxygen present in the environment.

---

failure

1. Term commonly used in regulation to describe a system malfunction; see also malfunction; 2. Breakage, displacement, or permanent deformation of a structural member or connection to reduce its structural integrity and its supportive capabilities.

---

fecal coliform (FC) bacteria

Indicator bacteria common to the digestive systems of warm-blooded animals that is cultured in standard tests to indicate either contamination from sewage or the effectiveness of disinfection processes; generally measured as number of colonies/100 mL or most probably number (MPN); see also most probable number.

---

feed

Parameter that describes the orientation of the manifold relative to the supply line and/or laterals in a system.

---

field capacity

Amount of water in a soil after drainage due to gravity following a thorough wetting event.

---

field flush

Act of opening a cleanout or valve to allow the movement of effluent to scour accumulated materials out of a pipe or pipes.

---

field pressure

See operating pressure.

---

fill

1. Unconsolidated material that meets specific textural criteria and is used as part of a dispersal component; 2. Unconsolidated material used to change grade or to enhance surface water diversion; 3. Any other human-transported unconsolidated soil material; see also cut and fill. 4. fFrst step in the sequential treatment processes that occur in a sequencing batch reactor or SBR.

---

fill system

See elevated system.

---

filter

Device that removes constituents through processes such as sieving, stagnation, adsorption, or absorption; a filter has both area and depth with respect to flow; see also screen.

---

filter sand

Media used to construct a filter for treatment of effluent; ideal filter sand has a relatively greater effective size (D10 value) and a low uniformity coefficent (UC); a jar test performed on the site verifies the acceptable amount of fines present in media; see also effective size, uniformity coefficient, and jar test.

---

filtration

Removal of suspended materials using processes such as sieving, stagnation, adsorption, absorption, and possibly biochemical degradation.

---

final backfill

Portion of an excavation extending from above the initial backfill to final grade; see diagram at bedding.

---

final cover

Soil with characteristics suitable for stabilizing the surface of system components, supporting vegetative growth and (in some cases) facilitating gas exchange.

---

final treatment and dispersal

Treatment system consisting of one or more components that provide for effluent distribution and final removal of constituents from effluent prior to dispersal back into the receiving environment via a soil treatment area.

fine bubble

Bubble of 0.2 to 3 mm diameter generated by an air diffuser.

fine bubble diffuser

Diffused aeration device that disperses very small air bubbles into mixed liquor in an aerobic treatment unit aerobic process; often described in relative sizes (e.g., micro-, fine, etc.).

finish grade

Final earth grade required by specifications.

fissured

Description of a soil material that tends to break along definite planes of fracture with little resistance, or a material that exhibits open cracks, such as tension cracks, in an exposed surface.

five-day biochemical oxygen demand (BOD5)

Quantitative measure of the amount of oxygen consumed by bacteria while stabilizing, digesting, or treating biodegradable organic matter under aerobic conditions over a five-day incubation period; expressed in milligrams per liter (mg/L).

fixed solids

Residue of total, suspended, or dissolved solids (mineral fraction) after heating to dryness for a specified time at a specified temperature.

fixed-film process

Configuration wherein the microorganisms responsible for treatment colonize a fixed medium; see also suspended growth process.

fixture unit

Relative estimate of discharge into a system by various types of plumbing fixtures; used in the determination of design flow.

flexible riser

Piping used to connect spray distribution heads to laterals using flexible pipe as a riser; allows proper placement of the distribution head in a location that may be both vertically and horizontally remote from the lateral; helps protect and isolate the lateral from damage.

float configuration

float switch

Sensor installed in a pump vault or tank which opens or closes an electrical circuit in response to changing liquid levels, thereby controlling equipment operation.

float tree

Removable device located within a pump vault or dosing tank to which float sensors are attached.

floatable

Material in wastewater with a density less than that of water.

floc

Collection of smaller particles agglomerated into larger particles as a result of chemical, physical, or biological treatment; the larger particles can be more readily settled or filtered out of the effluent; see flocculation.

flocculants

Water-soluble organic polyelectrolytes that are used alone or in conjunction with inorganic coagulants to agglomerate the solids present in water; this process forms large, dense floc particles that settle rapidly.

flocculation

Agglomeration of colloids and finely divided suspended matter by biological, chemical, hydraulic and/or mechanical means.

floodplain (100-year)

Any area susceptible to inundation by flood waters from any source and subject to the statistical 100-year flood; such an area has a one percent chance of flooding each year.

floodway

Channel of a watercourse and the adjacent land areas (within a portion of the 100-year floodplain) that must be reserved in order to discharge the 100-year flood without cumulatively increasing the water surface elevation more than one foot above the 100-year flood elevation before encroachment into the 100-year floodplain.

flow attenuation

System configuration using internal design features and devices to moderate peak inflows by restricting the discharge rate to the next component; see also flow equalization.

flow equalization

System configuration using storage capacity to moderate peak flows over time and decrease the discharge rate to match the hydraulic or organic capacity of downstream components; see also flow attenuation and dosing, time.

flow equalization tank

Dosing tank that provides storage of effluent and uses time dosing for uniform delivery to a subsequent component over time, usually a day or more; also known as a surge tank.

flow measurement

Any method used to accurately quantify the flow of liquid.

flow meter

Device that measures the instantaneous and/or cumulative amount of liquid that passes a designated point and is delivered to the next component.

flow restrictor baffle

Baffle designed to moderate discharge rate.

flow splitter

See distribution device.

flowage

Body of water that has been created by deliberately flooding an area.

flush

Process of using effluent to scour a component and transport accumulated materials.

flush toilet

Toilet consisting of a bowl (for receiving human waste) and a water-flushing device.

flushing

Action of using effluent to scour a component and transport accumulated materials.

flushing port

Orifice that controls the expelling of effluent and accumulated materials from a distribution system.

flushing valve

Valve used to control the expelling of effluent and accumulated materials from a distribution system.

---

foam filter

Media filter that utilizes an open-cell polyurethane foam material that is randomly arranged in prefabricated modular units.

FOG (fats, oils, and grease)

Constituent of sewage typically originating from foodstuffs (animal fats or vegetable oils) or consisting of compounds of alcohol or glycerol with fatty acids (soaps and lotions), typically measured in mg/L.

---

footprint

Plan view of the area and geometry of a system.

---

footslope

The hillslope position that forms the inner, concave surface at the base of a slope, and situated between the backslope and a toeslope; see also summit, shoulder, backslope, and toeslope.

---

force main

Part of a collection system consisting of the piping that conveys sewage under pressure from a lift station to either a treatment system or a location where gravity flow can be used for conveyance.

---

foresight (FS or -)

Rod reading taken on a point of unknown elevation; foresight reading is subtracted from the Height of Instrument (HI) to determine the elevation of the desired point.

---

forward flow

The average flow generated at the dwelling that passes completely through the system to the soil treatment area.

---

foundation

Natural or prepared ground or base on which some structure rests.

---

four-way valve

Valve that controls the effective action of the pump associated with a cargo tank; valve either directs the air flow into the cargo tank to create pressure or it directs the flow out of the cargo tank to create a vacuum.

---

fragipan

Dense, brittle, usually acid subsoil horizon which limits the movement of water, air, and roots; extreme density and compactness is not a result of high clay content but of a dense soil fabric arrangement and/or cementation by various chemical constituents.

---

free available chlorine

Quantity of hypochlorous acid (HOCl) and hypochlorite ions (OCl -) present after the introduction of chlorine for disinfection purposes; the relative distribution of these is affected by pH and temperature with lower pH favoring hypochlorous acid which has significantly higher germicidal efficiency than hypochlorite ions.

---

free face

The part of a hillside or mountainside consisting of an outcrop of bare rock (scarp or cliff) that sheds colluvium to slopes below and commonly stands more steeply than the angle of repose of the colluvial slope (e.g., talus slope) immediately below.

---

free liquid elevation

---

free water surface constructed wetland system

Constructed wetland in which wastewater is exposed at the surface of the media.

freeboard

A critical safety margin, representing the vertical distance between the normal operating water level (or flood level) and the top of a containment structure, channel, or vessel, that prevents overflow from waves, surges, or unexpected rises; see also head space.

---

french drain

See interceptor drain.

---

friction head

Component of total dynamic head (TDH) described as the sum of all friction loss in the piping network and associated devices; see also friction loss.

---

friction loss

Reduction in pressure of liquid flowing through piping and associated devices as a result of contact between the liquid and the pipe walls, valves, and fittings.

---

gas deflector baffle

Baffle designed to direct gases and rising solids away from the bottom of the outlet.

---

gate valve

Valve employing a gating mechanism to control flow of fluid; gates may be of a plate design located in slots and opened either fully or partially.

---

gear

---

geometric mean (geo mean):

A type of average, calculated as the n^{th} root of the product of n values. For example, if ten measurements were taken, the geometric mean of those measurements would be the 10^{th} root of the product of those ten measurements

---

geotextile fabric

1. Synthetic fabric installed over distribution media to prevent migration of fine material; 2. Synthetic fabric used to control soil erosion and/or weed growth.

---

globe valve

Valve consisting of a movable disk-type element and a stationary ring seat in a generally spherical body; often used for throttling.

---

glue

Substance used in conjunction with a primer in the solvent welding process; see also primer.

---

grab sample

Discrete sample collected at a particular time and location.

---

gradation curve

Graphical representation of the results of a sieve analysis; see also sieve analysis.

---

grade

Rate of rise or fall along a specified line; grade is the same as slope; can be expressed in percent (as feet of rise or fall per 100 feet of horizontal distance), as a decimal equivalent as feet of rise or fall per foot or horizontal distance, or as a ratio.

---

grade elevation

Elevation of the bottom of an excavated trench, ditch, or other finished surface; the term ‘grade’ is sometimes used to denote the elevation of the finished surface of an engineering project.

---

grade stake

Stake indicating the amount of cut or fill required to bring the ground to a specified level.

---

granular

Soil structure descriptor for soil consisting of gravel, sand, or silt, (coarse grained textures) with little or no clay content; granular soil has no cohesive strength; some moist granular soils exhibit apparent cohesion; granular soil cannot be molded when moist and crumbles easily when dry.

---

granular soil

Gravel, sand, or silt, (coarse grained soil) with little or no clay content; granular soil has no cohesive strength; some moist granular soils exhibit apparent cohesion; granular soil cannot be molded when moist and crumbles easily when dry.

---

graph

---

grassed waterway

Natural or constructed watercourse or outlet that is shaped or graded and established with suitable vegetation to minimize erosion during periods of surface water runoff.

---

gravel

Rounded or subrounded rock fragment that is between 0.1 inch (2 millimeters) and 3 inches (76 millimeters) in diameter.

---

gravelless pipe

Distribution medium consisting of perforated, corrugated pipe encased in a geotextile wrap.

---

gravimetric

Of or pertaining to measurement by weight.

---

gravity distribution

Using the force of gravity to convey wastewater or effluent to one or more components or devices; gravity distribution to trenches may be parallel, sequential or serial; see also parallel distribution; sequential distribution; and serial distribution.

---

gravity main

Primary collection piping placed on a carefully controlled grade; used for conveyance of wastewater via gravitational force.

---

gravity sewer

---

graywater

Water captured from non-food preparation sinks, showers, baths, spa baths, clothes washing machines, and laundry tubs; see also blackwater.

---

grease interceptor

Watertight device designed to intercept, congeal, and retain or remove fats, oils, and grease (FOGs) from food-service wastewaters; may be located inside (grease separator) or outside of a facility that generates commercial food service wastewater.

---

grease separator

Mechanical grease interceptor usually associated with a plumbing unit and located within a facility that physically separates grease from the liquid, retaining the grease and discharging the liquid.

---

grease tank

See grease interceptor.

---

grease trap

See grease interceptor.

greywater

See graywater.

---

grinder pump

Centrifugal pump with blades at the intake that shreds solids in a waste stream and conveys the resulting mixture under pressure to a subsequent system component.

---

ground-fault circuit interrupter (GFCI)

Safety device that quickly interrupts the flow of electric current in a circuit when it detects a ground fault or leakage to prevent electric shock hazards.

---

groundwater

Portion of the water below the surface of the ground at a pressure equal to or greater than atmospheric; see also water table.

---

groundwater interceptor

See interceptor drain.

---

groundwater lowering system

Assembly of components and devices designed to actively or passively lower the water table beneath a soil treatment area.

---

groundwater mounding

Localized increase in the elevation of a water table that results from the downward percolation of additional liquid toward groundwater.

---

guard stake

Stake, strip, or lath placed beside a hub stake to identify it.

---

hard malfunction

Component malfunction that disrupts the overall system performance and constitutes an immediate public and environmental health and safety risk.

---

haunch

1. Portion of piping or conduit extending from its bottom to the spring line; 2. Lower third of the circumference of a cylindrical tank; 3. Portion of non-straight-walled tank below the horizontal plane defined by its greatest width; see diagram at bedding.

---

haunch zone

Portion of an excavation where the haunch of a pipe, conduit, tank or structure is located; see diagram at bedding.

---

haunching

Material placed around piping, conduit, tank, or component for uniform structural support within the haunch zone; (2) placing backfill or embedment around a conduit or structure in an excavation such that the void area is stabilized; see diagram at bedding.

---

hazardous atmosphere

Atmosphere which by reason of being explosive, flammable, poisonous, corrosive, oxidizing, irritating, oxygen deficient, toxic, or otherwise harmful, may cause death, illness, or injury.

---

head

Energy, either velocity or potential, possessed by each unit weight of a liquid, expressed as the vertical height through which a unit weight would have to fall to release the average energy possessed; used in various compound terms such as pressure head, elevation head, velocity head, and friction head; typically measured in feet of liquid or pounds per square inch (psi).

---

head loss

Change in pressure between two points in an operating system as a result of friction and/or a change in elevation; also called pressure loss.

head slope

A geomorphic component of hills consisting of a laterally concave area of a hillside, especially at the head of a drainageway, resulting in converging overland water flow (e.g., sheet wash); head slopes are dominated by colluvium and slope wash sediments (e.g., slope alluvium); contour lines form concave curves.

---

head space

1. Volume between the invert of the outlet and the inside top of a septic tank or a trash tank, also known as freeboard; 2. Volume between the invert of the tank inlet and the inside top of a dosing tank; see also reserve volume.

---

header pipe

See manifold.

---

headworks

All parts and/or devices between the discharge assembly and the distribution laterals (including filtration devices, valves, gauges, and pressure regulators), used to control the quality, rate, pressure, and direction of flow of effluent; typically used in a drip distribution system.

---

height of instrument (HI)

Elevation of the line of sight of the surveying instrument; determined by adding the Backsight (BS or +) to the known elevation of the point upon which the rod reading was taken, usually a benchmark or turning point.

---

helminth

Worm-like organism that can infect humans and other animals; constituent of concern in biological wastewater treatment.

---

heterotrophic plate count

Standard procedure for estimating the total number of live non-photosynthetic bacteria in water; colony-forming units (CFU) are counted after spreading an aliquot of a sample over a membrane or pour plate and incubating in an amiable growth medium (agar) at an amiable temperature; see also colony-forming unit (CFU).

---

high level sensor

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high-head pump

See centrifugal pump.

---

high-strength wastewater

1. Influent having BOD5 greater than 300 mg/L; and/or TSS greater than 200 mg/L; and/or fats, oils, and grease greater than 50 mg/L entering a treatment component (as defined by NSF Standard 40 testing protocol); 2. Effluent exiting a septic tank or other pretreatment component that has BOD5 greater than 170 mg/L; and/or TSS greater than 60 mg/L; and/or fats, oils, and grease greater than 25 mg/L and is applied to an infiltrative surface.

---

holding tank

1. Watertight receptacle for the collection and holding of wastewater; 2. Sewage tank in a recreational vehicle, motor coach, trailer, camper, or boat, whether mobile or stationary; see also holding tank sewage system.

---

holding tank sewage system

System which combines or utilizes a holding tank with alarm, the services of a sewage pumper/hauler, and off-site treatment of the collected sewage.

---

horizon

See soil horizon.

---

hub stake

Short stake placed at a station and driven almost flush with the ground; hub stakes are used to obtain station elevations in drainage and other kinds of elevation work; also called a hub.

---

hue

Measure of the chromatic composition (wavelength) of light that reaches the eye; one of the three variables of color; see also Munsell Color System, chroma, and value.

---

hydraulic conductivity

Measurement of the flow of liquid through an area perpendicular to the flow direction.

---

hydraulic grade line

The surface or profile of water flowing in an open channel or a pipe flowing partially full. If a pipe is under pressure, the hydraulic grade line is at the level water would rise to in a small tube connected to the pipe. To reduce the release of odors from wastewater, the water surface or hydraulic grade line should be kept as smooth as possible.

---

hydraulic loading rate

Quantity of liquid applied to a component surface area or capacity in a time interval, usually expressed as volume applied in a time interval to a surface area (e.g., gallons per day per square foot [gpd/ft^2]), or capacity (e.g., gallons per day, hour or minute).

---

hydrologic cycle

Biogeochemical cycle that continuously circulates water through the earth-atmosphere system via processes including evaporation, transpiration, condensation, precipitation, and runoff.

---

hydrolysis

Conversion of constituents to sugars, acetic acid, and fatty acids.

---

hydromechanical grease interceptor

See grease separator.

---

hydrophilic

Having a strong affinity (liking) for water; the opposite of hydrophobic.

---

hydrophobic

Having a strong aversion (dislike) for water; the opposite of hydrophlic.

I and I

Infiltration and inflow; term used to describe the combined undesirable entry of extraneous water into a system component; see also infiltration and inflow.

---

idle

Sixth and final step in the sequential treatment processes that occur in a sequencing batch reactor (SBR).

IFAS

See integrated fixed-film activated sludge .

---

impedance

The total oppostion to an alternating current presented by an electrical circuit. Expressed in ohms.

---

impeller

A rotating device that increases the pressure and flow of a liquid.

---

impermeable

Not permitting the passage of fluid through pores; in practical terms, some small level of hydraulic conductivity may occur, but at so low a level (e.g., 1 x 10-7 cm/s) that it is negligible.

---

impervious

Resistant to penetration or passage by fluids or by roots.

---

in-ground system

See below-grade.

---

in-line filter

Device installed as a part of the piping in a system, operated under pressure and designed to remove suspended solids from wastewater.

---

indicator organism

Organism that can be readily detected, the presence of which infers the presence of other microorganisms (e.g., fecal coliform bacteria is an indicator of probable presence of pathogens); see also coliform bacteria, fecal and coliform bacteria, total.

---

individual wastewater treatment system

Wastewater treatment system designed to serve one sewage-generating dwelling or facility.

---

inductance

The production of magnetization of electrification ina body by the proximity of a magnetic field or electrical charge, or of the electric current in a conductor by the variation of the magnetic field in its vicinity . Expressed in Henrys.

---

industrial wastewater

Water or liquid-carried waste from an industrial process resulting from industry, manufacture, trade, automotive repair, vehicle wash, business or medical, activity; this wastewater may contain toxic or hazardous constituents.

---

infective dose

number of microorganisms that would initiate an immunological response by a host.

---

infiltration

1. Wntry of water or effluent into the soil; 2. Undesirable inflow or seepage of water into a system component; for example, infiltration of surface water into a tank through a leaking pipe, pipe penetration, or through an access riser/tank seam that is not water-tight.

---

infiltrative surface

Designated interface where effluent moves from distribution media or a distribution device into treatment media.

---

inflow

Extraneous water entering a component directly, such as via a sump pump, foundation drain, storm gutter or condensate drain.

---

influent

Liquid entering a component or device.

---

influent quality

Physical, biological, and chemical characteristics of the liquid flowing into a system component or device.

---

initial backfill

Portion of an excavation above the haunch zone or bedding with a depth of 6-12 inches (15 to 30 cm) above the piping, conduit tank, or structure; see diagram at bedding.

---

injection well

Well by which effluent is transmitted to an underground formation; in most cases these are regulated and require a permit from a regulatory authority.

---

inlet

Piping that conveys wastewater or effluent into a component.

inlet baffle

Pipe tee or wall segment located at or near the inlet pipe of a septic tank and designed to dissipate energy, direct flow below the liquid surface, isolate scum from the inlet pipe, and allow ventilation.

---

innovative onsite wastewater treatment system

See alternative onsite wastewater treatment system.

---

inorganic

Non-carbon-based molecules such as minerals and salts.

---

inorganic phosphorus

Forms of phosphorus from mineral sources, such as orthophosphate, pyrophosphate (P2O7-4), and tripolyphosphate (P3O105-).

---

inspection

Evaluation of and reporting on the status of a wastewater treatment system.

---

inspection port

Access point in a system component that enables inspection, operation and maintenance.

---

inspector

Service provider who evaluates and reports upon the status of a wastewater treatment system.

---

install

To put in place or construct components.

---

installation

Assembly and placement of components of a system, including final site grading and establishment of an appropriate cover.

---

installer

Service provider who is compensated to construct a wastewater treatment system.

---

instantaneous flow

Highest recorded flow occurring within a short, specific period (expressed in gallons per minute).

---

instantaneous loading rate

Quantity of liquid applied to a component surface area or capacity in a short time interval, expressed as volume per unit time, (e.g., gallons per minute [gpm]) or volume per unit time per unit area (gpm/ft^2).

---

integrated fixed-film activated sludge (IFAS)

Wastewater treatment process that incorporates both activated sludge and fixed-film treatment to biologically convert non-settleable (suspended, dissolved, and colloidal) organic materials to a settleable product using aerobic and facultative microorganisms.

---

integrated sample

Combination of grab samples collected at a similar time but at different locations.

---

integrated treatment and dispersal

System in which treatment components are installed directly into the soil treatment area, so that both treatment and dispersal processes occur in a single location.

interceptor drain

Subsurface drain used to intercept and divert laterally moving groundwater or perched water away from the soil treatment area or other system component to an effective outlet; see also perimeter drain.

---

interfluve

Landform composed of the relatively undissected upland or ridge between two adjacent valleys containing streams flowing in the same general dierction.

---

interstream divide

A broad, nearly level "summit" or interfluve; see also interfluve.

---

invert

Elevation of the bottom of the inside pipe wall or fitting.

---

ion exchange

Reversible chemical process in which electrically charged particles are exchanged between a solution and a solid.

---

irradiance

Measure of light “intensity” at the surface; the radiant power arriving at a point on a surface, per unit area (mW/cm^2)

---

isolation valve

Valve that is placed before or after a piece of equipment in case that equipment may need to be removed from service.

---

jar test

---

jetter

Device that uses pressurized water conveyed through a hose with a special nozzle to dislodge and break up foreign material.

---

junction box

Metal or hard plastic electrical box, housing only wire or cable connections; in exterior locations, must be watertight.

---

kickout

Accidental release or failure of a cross brace.

Kjeldahl nitrogen

Combination of ammonia nitrogen (NH_3) and organic nitrogen in a wastewater sample; total kjeldahl nitrogen is operationally defined by a method that involves digestion of a sample followed by distillation and determination of ammonia (NH_3) in the distillate; see also ammonia nitrogen; organic nitrogen; and total Kjeldahl nitrogen (TKN).

KSAT

Saturated hydraulic conductivity.

---

lacustrine

Material deposited in lake water and later exposed either by lowering of the water levewl or by the elevation of the land.

---

lagoon

Constructed basin lined with either soils with very low permeability or a synthetic material, surrounded with berms and which contains at least three feet of wastewater and which utilizes sunlight, wind or mechanical aeration and natural bacteria to break down waste via physical, chemical, and biological processes.

---

land application

Process in which biosolids or liquid waste treatment residuals are spread over, sprayed onto, or injected into the soil.

---

land clearing

Removal of vegetation including root mass.

---

land survey

Plane survey made for locating property lines, subdividing land into smaller parts, and determining land areas and other information involving the transfer of land from one owner to another; also known as a property survey, boundary survey, or cadastral survey.

---

landform

Physical, recognizable forms or features on the earth surface, having a characteristic shape and produced by natural causes.

---

landscape

Portion of the land surface that the eye can comprehend in a single view.

---

landscape linear loading rate

Cumulative total of effluent applied to the soil profile at the perimeter of a dispersal system, describing the effluent dispersal to the receiving environment in a time interval, expressed as volume per unit length per unit time to the window of acceptance (e.g., gpd/ft); see also contour loading rate, and window of acceptance.

---

landscape loading rate

See landscape linear loading rate.

---

landscape position

Position describing the location of the soil on the landscape; two-dimensional landscape positions may be summit, shoulder, backslope, sideslope, footslope, or toeslope; three dimensional views of geomorphic landscape position can be described as headslope, noseslope, sideslope, base slope, etc.; site drainage characteristics include intermittent drainageways, active drainageways or other flood-prone areas.

---

laser level

Level that employs the use of a laser projected on a target.

---

lateral

Pipe, tubing or other conveyance used to carry and distribute effluent.

---

lateral turnup

Ninety- or forty-five-degree change in piping orientation from horizontal to diagonal and/or vertical at the end of a pressure distribution line; effectively brings the pipe to or above grade, facilitating periodic flushing of the lateral and enabling certain operational activities.

---

lateral volume

Amount of liquid required to fill a lateral.

---

layered system

Two or more distinctly different soil or rock types arranged in layers; micaceous seams or weakened planes in rock or shale are considered layered.

---

layout

Staking out the system on the site, including staging areas required for completion of the project.

---

leach field

See soil treatment area.

---

leaching pit

See seepage pit.

---

level

1. Instrument for observing levels, having a sighting device (usually telescopic) and capable of being made precisely horizontal; also called a surveyor's level; 2. Observation made with such an instrument.

---

level rod

Pole marked with a gradation facilitating the determination of a relative elevation for a point, typically constructed of wood and graduated in feet and tenths and hundredths of a foot; also known as a stadia rod.

---

licensure

Granting of licenses especially to practice a profession; the state of being licensed.

---

lifecycle cost

Total cost of a system over its design period including capital costs and ongoing operation and maintenance costs; expressed as a total present value or a monthly value over the expected life; costs in future years are discounted to the present.

---

lift station

Structure containing relatively large pumps and associated piping, valves, and other mechanical and electrical equipment for pumping liquid.

---

limit of disturbance

Line drawn on a plan that differentiates between the construction, clearing and traffic area required for the completion of an installation and the area that is to be left as found; the area is delineated on the site using a silt fence or haybales that prevent the transportation of any fines outside the construction area because of surface runoff.

---

limiting condition

Soil or site characteristic that reduces efficacy of soil treatment and thus restricts design options for a system; typically defined from a regulatory standpoint.

---

limiting layer

See restrictive layer.

---

line of sight

Straight line passing through the center of the barrel of a telescope used in surveying; always parallel to the datum.

---

linear loading

Quantity of liquid applied along the length of a lateral, trench or bed, typically expressed as volume per unit length (e.g. gallons per foot).

---

linear loading rate

Quantity of liquid applied along the length of a lateral, trench or bed in a time interval, typically expressed as volume per unit length per unit time (e.g. gallons per foot per day).

---

linear slope

Landscape form or feature that is narrow and elongated; the slope is uniform as one travels downslope.

---

lined evapotranspiration (ET) bed

Dispersal component with a continuous, impermeable bed liner that uses evaporation and transpiration for dispersal of effluent; sometimes called an evapotranspiration/adsorption (ETA) bed.

---

liner

Impermeable synthetic or natural material used to prevent or restrict infiltration and/or exfiltration.

liquefaction

The biological transformation of suspended volatile organic carbon into dissolved compounds available for oxidation.

---

liquid capacity

See tank capacity.

---

liquid chlorine

---

liquid limit

Moisture content at which soil becomes unstable and will flow; measured by American Society of Testing and Materials Standard Test Method ASTM D4318 (2005).

---

load level indicator

Device that allows monitoring of the liquid level in a cargo tank.

---

loading rate

Volume or mass of a constituent applied to a component linear length, surface area, or volumetric capacity during a specific time interval; mass units typically expressed as mass per component length (pounds per linear foot per unit time), mass per surface area (pounds per square foot per unit time) or mass per component capacity (pounds per cubic foot per unit time); volumetric units typically expressed as volume per component length (gallons per linear foot per unit time), volume per surface area (gallons per square foot per unit time) or volume per component capacity (gallons per cubic foot per unit time).

---

log-reduction

The reduction in the relative concentration of infective pathogens or surrogate parameters through a treatment process expressed in $\log_{10}$ units. For example, a 1-log reduction equates to 90% removal, 2-log reduction to 99% removal, and 3-log reduction to 99.9% removal

---

long-term acceptance rate (LTAR)

Design parameter expressing the rate that effluent enters the infiltrative surface of the soil treatment area at equilibrium, measured in volume per area per time, e.g. gallons per square foot per day (g/ft2/day).

---

looped manifold

Configuration in which the supply line connects to the manifold and a return line is installed to create a complete connection; used in drip distribution.

---

low-head pump

See centrifugal pump.

---

low-pressure distribution

Application of effluent over an infiltrative surface via pressurized orifices and associated devices and parts (including pump, filters, controls, and piping).

---

low-pressure distribution STA

Distribution via a network of small diameter laterals (typically 1 ¼-inch) with small orifices (typically 1/8- to 3/16-inch) installed in a soil treatment area; also called low-pressure pipe (LPP) distribution.

---

low-pressure dosing

See pressure-dosed

LPD

See low-pressure distribution.

LPP

See low-pressure distribution STA.

LTAR

See long-term acceptance rate.

main line

Supply line in a spray dispersal system between a pump discharge assembly and a distribution device.

maintenance

Routine or periodic action taken to ensure proper system performance and extend system longevity.

maintenance entity

See management entity; and responsible management entity.

malfunction

Condition in which a component or system does not perform as designed/installed; see also hard malfunction; and soft malfunction.

management entity

Person or organization that administers a set of activities associated with system management (e.g., the owner, homeowners' association, contracted management service); the owner is ultimately responsible; see also system management, responsible management entity; and management program.

management information system

Computer-based system capable of capturing, storing, analyzing, and displaying specifically referenced information.

management program

Comprehensive, life-cycle series of elements and activities that address issues critical to wastewater treatment systems including the following activities: planning, siting, design, permitting, installation, inspection, operation, monitoring, maintenance, and replacement; residuals management; education, training, certification, and licensing; technology verification, certification and accreditation; corrective action and enforcement; as well as recordkeeping, inventorying, reporting, financial assistance, and funding.

management service

Provision of one or more activities required to ensure that the wastewater treatment performance requirements established by the regulatory authority are achieved; may include planning, design, permitting, inspection, construction/installation, operation, maintenance, monitoring, enforcement, etc.; ideally, management services are provided by properly trained personnel and tracked by means of a management information system; see also management information system.

manhole

Opening in a component (such as a grease trap) or a collection system through which physical access is gained for service; incorporates a cover that can be secured.

manifold

Piping network having several outlets or inlets through which a liquid or gas is distributed or collected.

manmade physical feature

Prominent or conspicuous part or characteristic of a site that is created by humans.

manufacturer-assembled

Component provided to the contractor in an operable condition ready for final plumbing and/or electrical connections at the site; see also contractor-assembled.

manway

Main portal for human entry into a cargo tank; access is usually at the highest point in the tank shell.

mass loading rate

Quantity of organic and inorganic effluent constituents delivered to a treatment component in a time interval, expressed as mass per time.

---

massive

Soil structure descriptor indicating a lack of distinct soil aggregates; material is a coherent mass {not necessarily cemented}, no secondary pores.

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mastic

Tar-like (asphalt or bituminous) material used to establish a watertight seal between parts of a device or component, such as between a septic tank and access riser, between riser sections or between the tank and lid.

MBR

Acronym for a membrane bioreactor.

---

mean high water (MHW)

Tidal datum described by the average of all the high-water heights observed over the national tidal datum epoch (the specific 19-year period adopted by the national ocean service as the official time segment over which tide observations are taken and reduced to obtain mean values for tidal data).

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mean sea level (MSL)

Tidal datum described as the arithmetic mean of hourly heights observed over the National Tidal Datum Epoch.

---

mean tide level (MTL)

Tidal datum described as the arithmetic mean of mean high water and mean low water; half-tide level.

---

measured flow

See daily flow; and average daily flow.

---

mechanical aeration

Process of introducing air into a treatment component or process by physical agitation using a device such as a paddle, paddle wheel, spray nozzle or turbine.

---

media

Solid material that can be described by shape, dimensions, surface area, void space, and application.

---

media filter

Device that uses materials of varying shape, size and substance that support biofilm development designed to treat effluent by reducing BOD and/or removing suspended solids in an unsaturated environment; biological treatment is facilitated via microbial growth on the surface of the media.

---

membrane bioreactor (MBR)

Generic suspended growth configuration (combined aeration and clarification in a suspended growth reactor) which incorporates a ceramic membrane to extract clarified effluent using a centrifugal pump or, more commonly, a vacuum pump.

---

mesophilic bacteria

Bacteria which grow best at temperatures between 20- and 50-degrees C (68- and 122-degrees F) with optimum growth between 25- and 40-degrees C (77- and 104-degrees F).

---

metabolize

Use chemical processes to convert food into energy, new growth and waste products.

---

methanogenesis

Conversion of acetic acid, hydrogen gas and carbon dioxide to methane.

---

micro bubble

Bubble of less than 0.2 mm diameter generated by an air diffuser.

mineralization

Biological transformation of organic nitrogen into other inorganic forms that can become part of additional biologically driven treatment processes.

minimum dose volume

Design parameter that specifies the smallest amount of effluent to be delivered to a component during a dosing event.

minimum liquid level

1. Distance from the bottom of a dosing tank to pump off elevation; coincides with the minimum volume required to maintain pump submergence; 2. Elevation at which a siphon completes a dose.

minimum volume

Smallest amount of effluent in a dosing tank (with either demand or time dosing) required to maintain pump submergence.

mitigation

Correcting system malfunction accomplished through an operational evaluation of all components (source, collection and storage, advanced treatment, final treatment, and dispersal) to determine the reason for the malfunction.

mixed liquor

Suspended mixture of activated sludge, dissolved gasses (e.g. DO) and wastewater undergoing treatment in the activated-sludge process; energy is required to maintain the condition.

mixed liquor suspended solids (MLSS)

Concentration of suspended solids in mixed liquor, expressed in milligrams per liter (mg/L); see also solids, suspended.

mixed liquor volatile suspended solids (MLVSS)

Fraction of the suspended solids in activated sludge mixed liquor that can be driven off by combustion at 550 degrees Celsius; indicates the concentration of microorganisms available for biological oxidation; see also solids, suspended.

modified mound

Above-grade integrated treatment and dispersal system designed and installed with greater than 0 and less than 12 inches of clean sand (ASTM C-33) between the bottom of the infiltrative surface and the original ground elevation; utilizes pressure distribution; a final cover of suitable soil material stabilizes the surface and supports vegetative growth.

moist soil

Condition in which a soil looks and feels damp; moist, cohesive soil can easily be shaped into a ball and rolled into small diameter threads before crumbling. moist granular soil that contains some cohesive material will exhibit signs of cohesion between particles.

monitoring

Assessing component or system status relative to specific operational, performance or compliance standards (e.g., process monitoring, qualitative or quantitative monitoring as part of service visit); see also, process monitoring.

monitoring port

monitoring well

Well constructed for the purpose of determining groundwater level or constituents.

monument

Permanent surveyor’s benchmark.

most probable number (MPN)

Estimate of the density of microorganisms in a sample based on certain growth rates and statistical formulas, commonly used for coliform bacteria.

mottling

See soil mottles

mound

Above-grade integrated treatment and dispersal system designed and installed with at least 12 inches of clean sand (ASTM C-33) between the bottom of the infiltrative surface and the original ground elevation; utilizes pressure distribution; a final cover of suitable soil material stabilizes the surface and supports vegetative growth.

MPN

Most probable number.

multi-stage pump

Centrifugal pump with multiple, small diameter impellers in series within a casing that enables the liquid to be delivered at a relatively high pressure; see also centrifugal pump.

Munsell Color System

Color designation system that specifies the relative degrees of the three variables of color: hue, value, and chroma; for example: 10yr 6/4 is the color called 'strong brown' with a hue = 10yr, value = 6, and chroma = 4; part of the classification system is commonly used to specify soil color; see also chroma; hue; and value.

natural physical feature

Prominent or conspicuous part or characteristic of a site that is not created by humans.

nephelometric turbidity unit (NTU)

Standard unit of measurement used in water analysis to estimate the clarity of water; a nephelometer passes light through a sample and measures the amount of light deflected (usually, that light deflected at a 90-degree angle).

nitrate nitrogen (NO3-)

Stable oxidized form of nitrogen; nitrifying bacteria can convert nitrite (NO_2^-) to nitrate (NO_3^-) in the nitrogen cycle.

nitrification

Biological oxidation of ammonium (NH_4^+) to nitrite (NO_2^-) and nitrate (NO_3^-), or a biologically induced increase in the oxidation state of nitrogen.

nitrification line

See trench.

nitrite nitrogen (NO2-)

Unstable oxidized form of nitrogen.

nitrogen (N)

Essential chemical element and nutrient for all life forms; molecular formula (N_2), constitutes 78 percent of the atmosphere by volume; nitrogen is present in surface water and groundwater as ammonia (NH_3), nitrite (NO_2^-), nitrate (NO_3^-), and organic nitrogen; excess levels of nitrogen in marine areas may contribute to eutrophication; see also ammonia nitrogen, ammonium nitrogen, nitratte nitrogen, nitrate; nitrite nitrogen and organic nitrogen.

nitrogenous biochemical oxygen demand (nBOD)

Quantitative measure of the amount of oxygen required for the biological oxidation of nitrogenous material (such as ammonia nitrogen and organic nitrogen) in wastewater; typically measured after the carbonaceous oxygen demand has been satisfied; nitrification fraction of the BOD_5 test; see also five-day biochemical oxygen demand; carbonaceous biochemical oxygen demand; and nitrification.

non pressure-compensating emitter (non-PC)

Emitter that discharges effluent at rates dependent upon operating pressure.

non-cohesive soil

Consists of granular materials like sand and gravel that do not stick together and rely on friction for stability; categorized by OSHA as Type C, which is the least stable and most dangerous for excavation work.

---

non-conforming onsite wastewater treatment system

Onsite wastewater treatment system that is not described in local regulatory code.

---

non-potable

Water that is not known to be safe to drink because it may either contain pollutants, contaminants, minerals, or infectious agents or may contain harmful constituents due to it not being a “permitted” source of drinking water; see also potable water.

---

nose slope

Geomorphic component of hills consisting of the projecting end of an interfluve, where contour lines form convex curves around the projecting end and lines perpendicular to the contours diverge downward. Overland flow (e.g., sheet wash) is divergent; nose slopes are comparatively drier portions of hillslopes and tend to have thinner colluvial sediments and profiles, dominated by colluvium and slope wash sediments (e.g., slope alluvium); see also head slope, side slope, free face, interfluve, crest, base slope.

NSF

National Sanitation Foundation

NSF Standard 40

National Sanitation Foundation (NSF) standard applied to certain residential wastewater treatment systems having rated capacities between 400 gallons (1,514 Liters) and 1,500 gallons (5,978 Liters) per day.

NSF Standard 41

National Sanitation Foundation (NSF) standard applied to certain treatment systems (such as composting toilets and similar technologies) that do not utilize a liquid saturated media as a primary means of storing or treating human excreta or human excreta mixed with other organic household materials.

NSF Standard 46

National Sanitation Foundation (NSF) standard applied to filtration devices for residential gravity flow septic tanks (effluent screens).

NTU

see nephalometric turbidity unit.

---

nutrient

Element or compound essential as a raw material for growth and development of an organism; nitrogen, phosphorus, and potassium are primary nutrients.

---

nutrient loading rate

Sum of organic and inorganic nutrients (primarily nitrogen and phosphorus) delivered to a treatment component in a specified time interval expressed as mass per time.

O&M service provider

Professional who performs operation and maintenance on a wastewater treatment system.

O-ring

Circular, rubber-material gasket that is used to seal the connection between two circular objects, such as the ends of piping.

---

observation port

See inspection port.

---

ohm probe sensor

onsite wastewater treatment system (OWTS)

Wastewater treatment system relying on natural processes and/or mechanical components to collect and treat sewage from one or more dwellings, buildings, or structures and disperse the resulting effluent on property owned by the individual or entity.

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operating depth

The depth of a septic tank as measured from the invert of the outlet pipe to the bottom of the tank; see also operating volume.

---

operating elevation

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operating head

See operating pressure.

---

operating level

Elevation of effluent in a tank under normal operating conditions; for a septic tank, operating level is located at the invert of the outlet piping; see also effective depth.

---

operating point

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operating pressure

1. Design parameter described as the pressure required for a component or device to operate properly (e.g., orifices, emitters, and sprayers must have the correct pressure to produce the correct flow rate and/or spray pattern); the sum of operating pressure and elevation head constitutes the static head component of total dynamic head (TDH); 2. Operational parameter described as the pressure measurement at a predefined location; see also static head; and total dynamic head.

---

operating volume

Amount of effluent contained in a tank under normal operating conditions; for a septic tank, operating volume is determined relative to the invert of the outlet; for a dosing tank, operating volume under normal conditions is determined relative to the invert elevation of the dosing tank inlet and the control off elevation; see also operating level.

---

operation

Act of assessing the functionality of each component of the system.

---

operation-based performance standard

Specific, measurable, and enforceable standard that establishes minimum operation and maintenance frequency, evaluation parameters and reporting requirements relative to the operational status of a system; see also operation; and maintenance.

---

operational depth

Distance between the invert of a dosing tank inlet and the control “off” elevation.

---

optical level

Level consisting of a high-powered telescope with a spirit level attached to it in such a manner that when its bubble is centered, the line of sight is horizontal.

---

ordinary high-water level

Elevation delineating the highest water level that has been maintained for a sufficient period to leave evidence upon the landscape; commonly the point where the natural vegetation changes from predominantly aquatic to predominantly terrestrial.

---

organic

Substance that contains a carbon molecule in its structure.

---

organic loading rate

Biodegradable fraction of chemical oxygen demand (biochemical oxygen demand, biodegradable FOG, and volatile solids) delivered to a treatment component in a specified time interval expressed as mass per time or area; e.g., pounds per day or pounds per cubic foot per day (pretreatment); pounds per square foot per day

(infiltrative surface or pretreatment); typical residential system designs assume biochemical loading equals organic loading; see also biochemical oxygen demand; chemical oxygen demand; and FOG.

---

organic matter

Material substances derived from organisms (plants or animals); containing carbon.

---

organic micropollutants

See trace organic contaminants.

---

organic nitrogen

Nitrogen bound in plant and animal matter, primarily amino acids and proteins; the amount of organic nitrogen can be obtained by separately measuring the ammonia nitrogen and subtracting that value from the total Kjeldahl nitrogen; see also Kjeldahl nitrogen and total Kjeldahl nitrogen (TKN).

---

organic phosphorus

Phosphorus formed primarily by biological processes; sources of organic phosphorus in sewage include bodily wastes, food residues, and the conversion of orthophosphates in biological treatment processes.

---

orientation

Position relative to true north to points on the compass, or to a specific place or object.

---

orifice

Discharge hole in a distribution system.

---

orifice shield

Part or device used to protect an orifice from external blockage.

OSHA soil classification system

Method of categorizing soil and rock deposits in a hierarchy of stable rock, Type A, Type B, and Type C, in decreasing order of stability; categories are determined based on an analysis of the properties and performance characteristics of the deposits and the environmental conditions of exposure; see also soil textural class.

---

outfall

Above-grade piping outlet designed and installed to convey high quality effluent or intercepted groundwater to the receiving environment.

---

outhouse

See pit toilet.

---

outlet

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outlet baffle

Pipe tee or wall segment located at or near the outlet pipe of a septic tank and designed to collect flow from the clear zone, isolate scum from the outlet pipe, and allow ventilation.

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overflow

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overflow baffle

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override timer

An operating parameter under which a secondary timer with a shorter off setting activates at a designated elevation and continues to control operation until level of effluent drops below the override timer sensor off elevation; the primary timer disengages while the secondary timer is engaged. also known as “peak enable” or “amber alarm”

OWTS

Onsite wastewater treatment system

---

oxidation

1. Chemical reaction in which a loss of electrons results in an increase in oxidation number (valence) of an element; occurs concurrently with reduction of the associated reactant; 2. Chemical or biological conversion of organic matter to simpler, more stable forms in the presence of oxygen with a concurrent release of energy; 3. process of a substance combining with oxygen.

---

oxygen transfer ratio

Amount of oxygen absorbed by a liquid compared to the amount delivered into the liquid through an aeration or oxygenation device, usually expressed as the percentage equivalent; used to compare performance of aeration systems.

---

ozonation

See disinfection, ozone.

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ozone

Unstable form of oxygen (O^3) used as an oxidizing, deodorizing, or bleaching agent, and sometimes used for disinfection of advanced treated effluent in an onsite wastewater treatment system; see also ozone disinfection.

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ozone disinfection

Chemical process used to inactivate microorganisms via the application of ozone to wastewater; see also ozone

---

ozone generator

Device that produces ozone gas

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package plant

Term commonly used to describe a modular aerobic treatment system unit serving multiple dwellings or establishments with relatively large flows (greater than 1,500 gallons per day).

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packed bed filter

See media filter.

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parabolic plow

Curved tillage implement used to disrupt a hardpan or plowman.

---

parallel distribution

Pressure or gravity distribution of effluent that proportionally and simultaneously loads multiple sections of a final treatment and dispersal component.

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parallel trench

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part

Subunit of a device; see also device and component.

---

particle size

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particle size analysis

Determination of the various amounts of the different soil separates in a soil sample, usually by sedimentation, sieving, micrometry, or combinations of these methods.

---

particle size distribution

Relative amounts or proportions based on size, of various inorganic separates in a sample, often expressed as mass percentages; see also ASTM C-33 and uniformity coefficient.

---

passive aeration

Process of introducing air into a treatment component or process without mechanical means; see also aeration, active.

---

pathogenic

Capable of causing disease; commonly applied to organisms that cause infectious diseases.

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pathogens

Organisms that cause infectious disease.

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pea gravel

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peak

A value greater than average.

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peak enable

1. Operating parameter that increases the frequency of timer operation of a pump to result in effluent delivery equal to design flow rate; 2. sensor that controls the peak enable function in a time dose system; see override timer; see also redundant off and timer enable.

---

peak flow

Highest flow occurring within a specified time (minutes, hours, days, etc.); may be further expressed as peak hourly flow, peak daily flow, peak monthly flow, peak seasonal flow, etc.

---

peaking factor

Ratio of a maximum flow to the average flow (such as maximum hourly flow or maximum daily flow to the average daily flow).

---

peat

1. Organic soil material in which the original plant parts are recognizable; 2. Fibrous organic material that may be used in a media filter.

---

peat filter

Media filter that uses appropriate organic fibric material (peat) as the media; typically packaged as pre-fabricated modular units of containerized media; a type of biofilter.

---

penetration

Opening in the wall of a container through which a pipe or electrical conduit enters.

---

perc test

See percolation test

---

perched water

See episaturation.

---

percolation test

Measurement of the drop in water level in a boring as water moves into the surrounding soil material; although sometimes conducted during site assessment for onsite/decentralized systems (often referred to as a "perc test"), soil morphologicial evaluation is the preferred method to determine hydraulic capacity and treatment potential of a given site.

---

performance

Parameter describing effectiveness of constituent removal.

performance standards

Minimum criteria for component or system treatment performance (e.g., presence or concentration of a constituent in effluent) typically established by a proprietary or regulatory authority to ensure compliance with public health and environmental goals of the state or community.

perimeter

Defined boundary of a soil treatment area.

perimeter drain

subsurface drain installed around and outside of an individual soil treatment area or zone and designed to actively or passively lower the water table.

permeability

Ability of a porous medium such as soil to transmit fluids (liquids or gases).

permit

Authorization, license, or equivalent control document issued by the appropriate regulatory authority to implement the requirements of a regulation.

pH

Measure of the acid or base quality of water that is the negative log of the hydrogen ion concentration; the scale ranges from 1-14, with a pH of 7.0 equal to neutral, 14.0 being strongly alkaline (basic), and 1.0 being strongly acidic.

pharmaceutical and personal care products (PPCP)

Chemical substances such as prescription or over-the-counter therapeutic drugs, fragrances, cosmetic, sunscreen agents, diagnostic agents, among others; see also trace organic contaminants.

phosphorus (P)

Chemical element and nutrient essential for all life forms, occurring as orthophosphate, pyrophosphate ($P_2O_7^{-4}$), tripolyphosphate ($P_3O_{10}^{5-}$), and organic phosphate forms; each of these forms, as well as their sum (total phosphorus), is expressed in terms of milligrams per liter (mg/L) elemental phosphorus; occurs in natural waters and wastewater almost solely as phosphates; excess levels of phosphorus in fresh surface waters may contribute to eutrophication.

physical treatment

Treatment which involves only physical means of solid-liquid separation, such as filtration, flotation, and sedimentation; chemical and biological reactions do not play an important role in physical treatment.

physical unit processes

Treatment methods in which the application of physical forces predominates as a means for removal of wastewater constituents; includes flocculation, sedimentation, flotation, filtration, screening, mixing and gas transfer.

piezometer

Instrument used to estimate hydraulic pressure in a conduit, tank, or soil by sensing the location of the free water surface.

piggyback

Electrical plug configuration wherein a float switch is plugged into an outlet and a pump is plugged into the back of the float switch.

pipe embedment

Portion of an excavation that includes the bedding, haunching and initial backfill of piping; see diagram at bedding.

pipe fill volume

Amount of effluent necessary to fill a supply line and distribution system.

pipe zone

Portion of an excavation where piping or other conduit is located; see diagram at bedding.

piping

piping configuration

piping installation

piping slope

pit run

Unprocessed sand or gravel found in natural deposits; also known as bank gravel or bank run.

pit toilet

Self-contained waterless toilet used for disposal of non-water-carried human waste; consists of a shelter built above a pit in the ground into which human waste falls.

plan

Drawing or diagram made by projection on a horizontal plane.

plan view

View from above; also known as bird's-eye or aerial view.

planimetric

Two-dimensional details that reflect accurate dimensions of and horizontal distances between features on a site.

planning

Process of reviewing proposed actions and associated impacts to ensure that community values and long-term sustainability are incorporated.

plans

Drawings showing locations and details of a system and its components, specifications, and other information as needed for bidding, staging, installation, inspection, and operation and maintenance of a system.

plant uptake

plastic limit

Moisture content at which soil can be rolled into 1/8 inch diameter wire without breaking; represents the soil moisture content above which manipulation will cause compaction or smearing; measured by ASTM Standard Test Method ASTM D4318 (2005).

plasticity

1. Degree to which a soil can be molded or deformed continuously and permanently using relatively moderate pressure without appreciable volume change or rupture; 2. Soil consistence term defined under wet conditions.

plasticity index

Numerical difference between the liquid limit and plastic limit of a soil; measured by ASTM Standard Test Method ASTM D4318 (2005).

platy

Soil structure descriptor for soil aggregates with horizontally oriented flat, plate-like particles.

plug

plug flow

Process in which fluid particles pass through a treatment device and are discharged in the same sequence in which they enter; the particles remain in the tank for a time equal to the theoretical detention time.

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plug flow reactor

Reactor in which fluid particles pass through the tank and are discharged in the same sequence in which they enter; see also plug flow.

---

polystyrene filter

Media filter that utilizes polystyrene material that is randomly arranged in prefabricated modular units.

---

ponding

Accumulation of liquid on an infiltrative surface.

---

poorly-graded

Material of uniform size with maximum void space; also known as well-sorted.

---

poorly-sorted

Material of variable size with minimum pore space; also known as well-graded.

---

porosity

1. Open space or interstices in rock, other earth materials or synthetic media; 2. Ratio of the open space to the total volume often described as a percentage.

---

port

---

portable toilet

See chemical toilet.

---

positive displacement pump

Pump in which liquid is induced to flow from the supply source through inlet piping and inlet valve; water is brought into the pump volute by a vacuum created by the withdrawal of a piston or piston like device, which, on its return, displaces a certain volume of water contained in the volute and forces it to flow through the discharge valve and piping.

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pot-holing

Process of locating and excavating buried utilities.

---

potable water

Water that is safe for human consumption; presumed to meet safe drinking water standards.

---

power take-off (PTO)

Device that conveys the power from the vehicle's main motor to the drive mechanism of an implement; e.g., the vacuum pump on a cargo tank.

PPCP

Pharmaceutical and personal care products.

---

precipitation

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predictive maintenance

Proactive maintenance strategy that uses data analysis to anticipate potential equipment malfunction and schedule maintenance proactively to minimize downtime, reduce maintenance costs, and optimize equipment lifespan by addressing issues before they escalate into major breakdowns.

prescriptive requirements

Minimum specific physical standards or specifications for design, siting, and construction of system components.

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pressure

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pressure compensating emitter (PC)

Emitter designed to deliver effluent at a consistent flow rate under a range of operating pressures above a threshold.

---

pressure distribution

Using a pump or siphon to convey wastewater effluent under pressure to one or more components or devices.

---

pressure dosed

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pressure loss

Change in pressure between two points in an operating system as a result of friction and/or a change in elevation; also known as head loss.

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pressure main

Primary supply line for pressurized transport or distribution of water or effluent; see also supply line.

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pressure manifold

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pressure regulator

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pressure relief valve

Valve that limits pressure to a preset level by exhausting surplus air or water volume, thereby assuring that the permissible operating pressure is not exceeded.

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pressure sewer

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pressure transducer

Device that senses pressure, converting that information to an electrical signal; an associated microprocessor then converts the signal to a measurement of pressure, depth, or flow.

---

pressure transducer sensor

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pressure-dosed

Delivery of effluent under pressure to a component or device; see also distribution, pressure-dosed gravity.

---

pressure-dosed gravity distribution

Gravity distribution of effluent over an infiltrative surface via one or more trenches or a bed following pressure dosing to a manifold or other distribution device; also known as ‘pump to gravity’.

---

pressure-regulating valve (PRV)

Valve designed to maintain a set pressure on the downstream side of the valve regardless of pressure changes on the upstream or source side.

---

pressurized flow

Portion of a dosing event during which the distribution system is full and thus at operating pressure.

---

pressurizing flow

Portion of a dosing event during which the distribution system is being filled and thus is not yet at operating pressure.

---

pretreatment

Any component or combination of components that provides treatment of wastewater primarily through sedimentation (floatation and settling).

---

preventative maintenance

Proactive maintenance strategy utilizing scheduled, time-based or usage-based approach to conducting activities, e.g., maintenance tasks at predetermined intervals (e.g., every three months or after 500 operating hours).

---

primary settling

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primary shut-off

First of two automatic shut-off valves that prevent the tank from being overfilled.

---

primary treatment

Physical treatment processes involving removal of particles, typically by settling and flotation with or without the use of coagulants; (e.g. a grease interceptor or a septic tank provides primary treatment); see also treatment, physical.

---

prime

1. Act of initiating pump operation by filling the pump housing with liquid; 2. Air pressure under the bell of a siphon that allows it to operate properly.

---

primer

substance used in conjunction with glue in the solvent welding process; see also glue.

---

prismatic

Soil structure descriptor for soil aggregates with prismlike shapes exhibiting a vertical axis much longer than the horizontal axes.

---

privy

See pit toilet.

---

proactive maintenance

Maintenance strategy focusing on preventing equipment malfunctions by performing activities such as periodic checks, inspections and routine maintenance tasks; activities focus on identification and mitigation or elimination of the root cause of malfunctions.

---

process flow

---

process monitoring

Recording data on equipment condition and process parameters using sensors, recording devices, meters, etc. to determine process operational conditions to facilitate identification of deviations from normal operation.

---

processing tank

Term applied to a septic tank when it is configured to receive a combination of raw sewage and recirculated effluent to enhance nitrogen removal.

---

profile leveling

Method of finding the elevations of a series of points at measured, horizontal distances along a line or path; process used in the development of a topographic map.

---

property line

Legal boundary defining land parcels.

proposed grade

Finish grade as specified on a plan.

---

proprietary

Held under patent, trademark, or copyright.

---

proprietary media

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protective system (soil)

Method of protecting employees from cave-ins, from material that could fall or roll from an excavation face or into an excavation, or from the collapse of adjacent structures. protective systems include support systems, sloping and benching systems, shield systems, and other systems that provide the necessary protection.

---

protozoan

Organism, usually unicellular and heterotrophic, that lives in aquatic and terrestrial habitats; pathogenic species are a constituent of concern in biological wastewater treatment systems.

PRV

See pressure-regulating valve.

---

psi

Acronym for expressing pressure in units of pounds per square inch

---

psychrophilic bacteria

Bacteria which grow best at temperatures between 10- and 30-degrees C (50- and 86-degrees F) with optimum growth between 12- and 18-degrees C (54- and 64-degrees F).

PTO

Power take-off.

---

pump

Mechanical device for driving fluid flow or for raising or lifting fluid by either suction or pressure or both.

---

pump basin

Shallow open container installed in a dosing tank; the container houses the pump and effectively raises the pump intake level to the lip of the basin.

---

pump capacity

Flow (gpm) a pump can deliver at a certain operating pressure (head).

---

pump curve

Graphical method that describes the relationship between the total dynamic head (TDH) and the capacity of pumps using various size impellers; the curve also includes information about efficiency and horse power consumption.

---

pump delivery rate

Flow delivered by a pump at a specified total dynamic head expressed as volume per unit time.

---

pump intake

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pump station

See lift station.

pump tank

Tank or compartment which provides storage of effluent and contains a pump and associated appurtenances used to convey effluent to another treatment process or a final treatment and dispersal component; see also dosing tank and siphon tank.

---

pump vault

Device installed in a septic or dosing tank that houses a pump and screens effluent before it enters the pump.

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pumped drainage

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pumped drainage tank

Dosing tank that collects and stores groundwater from a subsurface drainage system and convey collected groundwater to a stabilized drainage outlet using a demand dosing configuration.

---

pumper

Service provider who removes and disposes of septage from a wastewater treatment component according to specific regulatory parameters.

---

pumping

1. Act of removing septage from a wastewater treatment system component; 2. Conveying effluent under pressure.

---

pumpout

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purification

PVC

Polyvinyl chloride

---

qualified person

One who, by possession of a recognized degree, certificate, or professional standing, or who with extensive knowledge, training and experience, has successfully demonstrated his ability to solve or resolve problems relating to the subject matter, work, or project; see also competent person.

---

quick disconnect

1. Device that allows removal of another device without cutting the associated piping; 2. Mechanical device that allows interruption of electrical power.

---

radial pump

Pump in which the impeller is a turbulent mixer that causes tank liquid to flow perpendicular to the impeller's axis of rotation; types of radial flow impellers include disk-style flat blade turbines and curved blade turbines; used in applications where high shear rates are needed, such as in dispersion processes.

---

rail

Device located within a dosing tank that supports the pump and facilitates its removal or replacement.

---

ramp

Inclined walking or working surface that is used to gain access to one point from another and is constructed from earth or from structural materials such as steel or wood.

---

range pole

Long pole with painted red and white delineations of one foot each; used to mark points that are difficult to see from a distance.

---

raw sewage

See sewage.

raw wastewater

Any wastewater leaving a source; see also sewage.

RBC

Rotating biological contactor.

---

react

Second step in the sequential treatment processes that occur in a sequencing batch reactor or SBR.

---

reactance

The opposition to an alternating current caused by inductance and capacitance in an electrical circuit, equal to the difference between capacitive and inductive reactance. Expressed in ohms.

---

reactive maintenance

Maintenance strategy where activities are only performed in response to component malfunction.

---

reactor

Container or tank in which controlled chemical and biological reactions used for the treatment of wastewater are carried out.

---

recharge

---

recirculated flow

Volume of effluent returned to a preceding treatment train component over a specific period.

---

recirculating

Design configuration wherein a portion of effluent is returned to a component for further treatment or to facilitate a treatment process.

---

recirculating media filter

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recirculating sand filter

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recirculating splitter valve (RSV)

Valve that contains a floating ball that rises when the tank level rises and prevents more water from entering the tank; when the water level drops, the ball drops and allows water to flow into the tank again.

---

recirculation

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recirculation ratio

Volume of effluent returned to the recirculation tank compared to the volume of forward flow to the next component of the treatment train; calculated by dividing the recirculated volume by the forward flow volume ([total dosed volume – forward flow volume] / forward flow volume); see also circulation ratio and forward flow.

---

recirculation tank

Dosing tank that mixes effluent from two or more components within the treatment train and allows a portion of partially treated effluent to pass through one or more treatment components again.

---

recirculation valve

piping configuration in a pump discharge assembly to return a portion of the flow back into the dosing tank to change the system duty point, adjust system operating pressure or mix the contents of a tank.

reclamation

See wastewater reclamation.

---

record drawing

Professionally drafted written plan produced by the designer that incorporates installer-documented modifications, substitutions and deviations made during construction. See also as-built drawing.

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recovery

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recycle line

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recycling

See wastewater recycling.

---

redox concentrations

Zones of apparent accumulation of Fe (iron) and/or Mn (manganese) oxides in soils.

---

redox depletions

Zones of low chroma where Fe (iron) and/or Mn (manganese) oxides and/or clay have been stripped out of the soil.

---

redox potential (oxidation-reduction potential [ORP])

Electrical potential (measured in volts or millivolts) of a system due to the tendency of the substances in it to give up or acquire electrons.

---

redoximorphic feature

Soil property that results from the reduction and oxidation of iron and manganese compounds in the soil after saturation with water and subsequent desaturation; see also redox concentration and redox depletion.

---

reduction

Addition of electrons to a chemical entity decreasing its valence or oxidation number; for example, under anaerobic conditions (no dissolved or molecular oxygen (O_2) present), sulfur compounds are reduced to produce hydrogen sulfide (H_2S) and other compounds; see also oxidation.

---

redundant off

1. Optional operating parameter in a time dosed configuration that acts as a fail-safe by preventing pump operation when effluent levels reach a specified level below the normal off level; 2. Sensor that controls the redundant off function in a time dose system; typically, this sensor is directly wired into the pump circuit, thus bypassing the timer or control circuits; 3. In a programmable system, the redundant off float allows the timer “on” cycle to continue even though the timer enable float deactivates; the configuration is intended to reduce the occurrence of short cycling in pumps.

---

referenced benchmark

Official, permanent point of known elevation; see also monument.

---

registered professional engineer

Person who is registered as a professional engineer in the state where the work is to be performed; a professional engineer, registered in any state is deemed to be a "registered professional engineer" within the meaning of this standard when approving designs for "manufactured protective systems" or "tabulated data" to be used in interstate commerce.

---

reliability-centered maintenance

Proactive maintenance strategy that focuses on understanding the functions and potential failure modes of equipment to determine the most effective maintenance approach; prioritizes maintenance efforts on critical components to ensure overall system reliability.

---

relief device

Configuration of non-perforated piping (such as a cross-over pipe or a stepdown) and/or a drop box that conveys effluent to the next trench; see also cross-over pipe and stepdown.

relief line

Device used to convey effluent to succeeding trenches in systems using serial or sequential distribution; see also stepdown and cross-over pipe.

remediation

Act or process of correcting a fault or deficiency without changing system structure or form.

remote continuous process monitoring

Remote access to and storage of real-time data associated with process information such as equipment condition and process parameters; includes the ability to identify deviations from normal operation and notify interested parties; see also *predictive maintenance.*

repair

Fixing or replacing substandard or damaged components; repairs can be categorized as required repairs, recommended repairs, and upgrades and may require a permit from a regulatory authority.

repair area

See reserve area.

replacement

Process of exchanging a component with an equivalent component.

reporting

Act of submitting a detailed report of inspection, monitoring or operation and maintenance activities performed on a wastewater treatment system.

reserve area

Area of land with demonstrated capacity for use as a final treatment and dispersal component upon which no permanent structure should be constructed and which is intended for replacement of the original system if needed.

reserve capacity

Extra treatment capacity built into wastewater collection, treatment, and dispersal components or systems to accommodate projected increases in flow.

reserve volume

Volume in the head space of a dosing tank between alarm on elevation and the invert of the inlet pipe; intended for temporary storage of effluent in the event of component malfunction or excessive flow.

residence time

See detention time.

residential strength wastewater

Effluent from a septic tank or other treatment device with a BOD^5 less than or equal to 170 mg/L; TSS less than or equal to 60 mg/L; and fats, oils, and grease less than or equal to 25 mg/L.

residuals

Solids generated and retained in wastewater treatment components during the treatment of sewage, including sludge, scum, and pumpings from grease interceptors, septic tanks, aerobic treatment units, or other components; *see also* **biosolids** *and* **septage.**

responsible management entity (RME)

1. Person or organization that administers and conducts a comprehensive set of activities recognized by the regulatory authority; 2. Legal entity that has the managerial, financial, and technical capacity to ensure the long-term, cost-effective operation, maintenance and monitoring of onsite and/or cluster wastewater treatment systems in accordance with applicable regulations and performance requirements (e.g., a wastewater utility or wastewater management district).

restrictive layer

Horizon or condition in the soil profile or underlying strata that restricts movement of fluids; a restrictive layer may constitute a limiting soil/site condition; examples include fragipan, spodic horizons, massive structural grade, or certain bedrock, etc.; see also limiting condition.

---

retention time

See detention time.

---

return activated sludge

Volume of solids-laden effluent returned to a preceding component of a treatment train; see also return flow.

---

return flow

1. Volume of effluent returned to a previous component of a treatment train configured with a recirculation mode; 2. Volume of effluent used to backflush or forward flush a component; 3. Volume of solids-laden effluent returned to a preceding component of a treatment train; also known as return activated sludge.

---

return line

1. Portion of the distribution system through which effluent is routed back to a preceding component such as in a drip distribution system; 2. Portion of a treatment component that conveys effluent back to an upstream component such as an activated sludge return or a recirculating media filter.

---

return manifold

Manifold that allows effluent from two or more laterals to be collected and conveyed to a return line.

---

reuse

See wastewater reuse.

---

reverse osmosis (RO)

Filtration method that removes ions and molecules from a solution by applying pressure to a semipermeable membrane.

---

rise to run

Slope or gradient; inclination of a line with respect to the coordinate axes; the rise along the y-axis divided by the run along th x-axis.

---

riser

1. Vertical piping that begins at the lateral and terminates in a spray distribution head in a spray dispersal system; 2. In reference to tanks, see access riser.

---

riser pipe

Piping connected to the loading pipe valve and projecting into a cargo tank that facilitates distribution of material within the tank during loading.

---

rock

Naturally occurring inorganic material with a defined structure and mineralogical composition.

---

rock fragments

Unattached pieces of rock 2 mm in diameter or larger.

---

rod reading

Reading taken on a leveling rod when sighting through the telescope of an optical leveling instrument.

---

rotameter

A device used to measure the flow rate of gases and liquids. The gas or liquid being measured flows vertically up a tapered, calibrated tube. Inside the tube is a small ball or bullet-shaped float (it may rotate) that rises or falls depending on the flow rate . The flow rate may be read on a scale behind or on the tube by looking at the middle of the ball or at the widest part or top of the float.

---

rotating beam laser level

Laser level providing a plane of reference over open areas.

---

rotating biological contactor (RBC)

Type of attached growth pretreatment component consisting of disks mounted on a drive shaft which rotates; microorganisms attached to the discs are alternately exposed to free oxygen in the atmosphere and the wastewater.

RSV

See recirculating splitter valve.

---

run

Length of drip tubing placed on a single contour of a drip distribution lateral.

---

runoff

Precipitation, snow melt, or irrigation in excess of what can infiltrate the soil surface in a given area and thus, flows across the surface.

---

runoff volume

Amount of precipitation (and/or irrigation) minus surface storage, infiltration, evapotranspiration, and interception, that exits a defined area.

---

runon

Surface water that enters an area from upslope.

---

safety

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sampling port

Part or device at a particular location in a component that allows a sample to be collected for analysis.

---

sand

Soil particle between 0.05 and 2.0 millimeters in diameter; see also soil separate; soil textural class; and soil texture.

---

sand filter

Media filter which uses sand meeting specific criteria as the treatment media.

---

sand-lined bed

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sand-lined trench

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sanitary tee

Pipe fitting in the shape of a “T” with a long-sweep radius; commonly used as a part of an inlet or outlet baffle in a septic tank.

---

saturated

Condition wherein all available soil pore space is occupied by water.

---

saturated hydraulic conductivity (KSAT)

A measure of how easily water moves through soil or rock when all the pore spaces are completely filled with water.

---

saturated soil

Soil in which the voids are filled with water; saturation does not require flow; saturation, or near saturation, is necessary for the proper use of instruments such as a pocket penetrometer or sheer vane.

SCADA

supervisory control and data acquisition

---

scale

1. Proportion between two sets of dimensions, as between those of a drawing and its original; for example, the scale of a drawing may be expressed as 1/4 inch = one foot; 2. Measuring tool used by architects and engineers in preparing drawings to a proportionate scale; 3. To measure a drawing with a scale. 4. Either pan or tray of a balance; 5. To climb, as a ladder; 6. Series of graduated marked spaces for measuring something, as on a thermometer; 7. Rust occurring in thin layers; 8. hard deposit of minerals on heater coils and pool surfaces.

---

scarify

Process of abrading or scratching the infiltrative surface prior to installation of a final treatment and dispersal component.

---

schedule 80

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screen

1. Porous material or mesh configured as a plate or cylinder that allows the passage of particles smaller than specified size, (e.g., an effluent screen) according to a specific flow/pressure relationship; a screen has area but no depth with respect to flow; 2. use of a porous material or mesh to separate particles by size; see also filter.

---

screen filter

Filter consisting of a mesh material configured as a cylinder and used to remove particles larger than a specific size in pressurized systems.

---

screening

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scum

Layer of floating material on a liquid surface.

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secondary restraint

Physical barrier installed in an access riser, manhole or lift station; serves as a safety feature to restrict unauthorized entry when the primary cover is removed.

---

secondary settling

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secondary shut-off

Second of two automatic shut-off valves that prevent a cargo tank from being overfilled and possibly causing ejection of material from the tank through the pump.

---

secondary treatment

Biological and chemical treatment processes designed to remove organic matter; a typical standard for secondary effluent is BOD and TSS less than or equal to 30 mg/L each on a 30-day average basis.

---

sedimentation

Settling of solid material out of a liquid, typically accomplished by reducing the velocity of the liquid below the point at which it can transport the suspended material; may be enhanced by coagulation and flocculation; also known as settling.

---

seepage bed

See bed.

---

seepage pit

Excavation deeper than it is wide, which receives septic tank effluent and from which the effluent seeps into the surrounding soil through the bottom and openings in the side of the pit; emphasis is on disposal rather than treatment, resulting in this technology being phased out; see also cesspool.

select fill

Unconsolidated material that meets specific textural criteria and is used as part of a dispersal component; see also fill.

---

self-leveling level

Optical level with a prismatic device suspended on fine, nonmagnetic wires, such that when it is approximately centered the force of gravity on the prismatic device causes the optical system to swing into a position so that the line of sight is horizontal.

---

self-priming pump

Pump that is designed such that a small amount of liquid retained in the housing enables the pump to initiate operation without additional liquid.

---

sensor

Part or device that detects a chemical, physical, or mechanical signal and converts it into an electronic one.

---

separation distance

Minimum vertical or horizontal space required between specified components, between components and physical features, or between components and legally-defined boundaries.

---

septage

Liquid and residuals removed from a septic tank or other pretreatment device, seepage pit, cesspool, portable toilet, Type III marine sanitation device, or similar domestic wastewater treatment works that receives only domestic wastewater; see also biosolids and residuals.

---

septic system

See onsite wastewater treatment system (OWTS).

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septic tank

Water-tight, covered receptacle for treatment of sewage; receives the discharge of sewage from a building, separates settleable and floating solids from the liquid, digests organic matter by anaerobic bacterial action, stores digested solids through a period of detention, allows clarified liquids to discharge for additional treatment and final dispersal, and attenuates flows.

---

septic tank effluent

Partially treated sewage that is discharged from a septic tank.

---

septic tank effluent gravity (STEG)

Collection system that uses septic tanks to separate solids and allow gravity flow of effluent to a subsequent component.

---

septic tank effluent pump (STEP)

Collection system that uses a septic tank to separate solids and incorporates a pump vault, pump and associated devices to convey effluent under pressure to a subsequent component.

---

sequencing batch reactor (SBR)

Component in which batch type suspended growth (activated sludge) processes are carried out in the same tank in stepwise order (e.g. fill, treat, settle, decant, and draw).

---

sequencing valve

Valve used to automatically direct flow to two or more final treatment and dispersal components, one or more at a time, and in a prescribed order.

---

sequential distribution

Distribution method in which effluent is loaded into one trench and fills it to a predetermined level before passing through a relief line or device to the succeeding trench; the effluent does not pass through the distribution media before it enters succeeding trenches; see also serial distribution.

---

serial distribution

Distribution method in which effluent is loaded into one trench and fills it to a predetermined level before passing through a relief line or device to the succeeding trench; effluent passes through the distribution media before entering succeeding trenches in a single uninterrupted flow path; see also sequential distribution.

---

service

Performing one or more activities related to wastewater treatment systems, including installation, inspection, operation, maintenance, assessment, and mitigation.

---

service life

The total time a device, component or system performs its intended function.

---

service provider

Any person who performs work in relation to wastewater treatment systems; may include site evaluators, designers, inspectors, installers, O&M service providers, and pumpers.

---

setback

Minimum horizontal separation distance between system components and site/facility features; typically defined by code or regulation.

---

settle

Third step in the sequential treatment processes that occur in a sequencing batch reactor (SBR).

---

settleable solids

Suspended solids that will settle out of suspension within a specified period, expressed in milliliters per liter (mL/L).

---

settling

Process of subsidence and deposition of suspended matter carried by a liquid; typically accomplished by reducing the velocity of the liquid below the point at which it can transport the suspended material; see also sedimentation.

---

settling tank

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settling time

Time during which suspended, aggregated, precipitated, or colloidal substances settle by gravity.

---

sewage

Untreated wastes consisting of blackwater and graywater from toilets, food preparation areas, baths, sinks, lavatories, laundries, and other plumbing fixtures in places of human habitation, employment, or recreation.

---

sewage collection system

System of piping, lift stations, and other appurtenances forming a network of service lines, laterals and collection lines to receive and convey wastewater either by gravity or pressure; typical maintenace access includes cleanouts and manholes located in the piping network; includes alternative collection appurtenances such as septic tank effluent gravity (STEG), septic tank effluent pump (STEP), vacuum sewer, and grinder or ejector pump basin systems.

---

sewage pump basin

Appurtenance in a sewage collection system consisting of a tank or basin for collecting wastewater and a pump with associated controls to convey the wastewater to downstream components.

---

sewer

See sewage collection system.

---

shallow bed

Bed installed in an excavation less than 18 inches deep such that the entire infiltrative surface is below the original ground elevation.

---

shallow narrow trench

Final treatment and dispersal component in which highly-treated effluent is distributed into trenches installed in the upper portion (8 to 12 inches) of the soil profile and dosed via low-pressure distribution laterals.

---

shallow trench

Trench installed in an excavation typically greater than 6 but less than 18 inches deep such that most of the entire infiltrative surface is below the original ground elevation; the orifices in the distribution piping are at or below original ground elevation.

---

sheeting

Members of a shoring system that retain the earth in position and in turn are supported by other members of the shoring system.

---

shield

Structure that is able to withstand the forces imposed on it by a cave-in and thereby protect employees within the structure; can be permanent structures or can be designed to be portable and moved along as work progresses; additionally, shields can be either pre-manufactured or job-built in accordance with OSHA 1926.652(c)(3) or (c)(4). Shields used in trenches are usually referred to as "trench boxes" or "trench shields."

---

shoring

Structure such as a metal hydraulic, mechanical or timber shoring system that supports the sides of an excavation and which is designed to prevent cave-ins.

---

shoulder

The hillslope-profile position that forms the convex, erosional uppermost inclined surface near the top of a slope. If present, it comprises the transition zone from summit to backslope. Compare summit, crest, backslope, footslope, and toeslope (Schoeneberger and Wysocki, personal communication, 2013; Hawley and Parsons, 1980).

---

shrink/swell clay

See expansive clay mineralogy.

---

shut off valve

Valve that prevents flow from entering a component.

---

side feed

A geomorphic component of hills consisting of a laterally planar area of a hillside, resulting in predominantly parallel overland water flow (e.g., sheet wash); contour lines generally form straight lines. Side slopes are dominated by colluvium and slope wash sediments. Compare base slope, head slope, nose slope.

---

side feed manifold

Configuration in which a long manifold is installed perpendicular to one set of distribution laterals that extend in one direction along the contour; the supply line may connect to the manifold in the center or at one end; used on level or nearly-level sites.

---

side slope

A geomorphic component of hills consisting of a laterally planar area of a hillside, resulting in predominantly parallel overland water flow (e.g., sheet wash); contour lines generally form straight lines. Side slopes are dominated by colluvium and slope wash sediments. Slope complexity (downslope shape) can range from simple to complex (Schoeneberger and Wysocki, personal communication, 2013). Compare base slope, head slope, nose slope.

---

sides

See faces.

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sieve analysis

Use of specific size sieves to determine the gradation (the distribution of aggregate particles, by size, within a given sample) in order to determine compliance with design, production control requirements, and verification specifications.

---

silt

Mineral particles that range in diameter from 0.02-0.002 mm in the International System or 0.05-0.002 mm in the USDA-NRCS system; see also soil separate, soil textural class and soil texture.

---

simplex system

Control that operates a single device (e.g., a simplex pump system).

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single beam laser level

Laser level projecting a string line that can be seen on a target regardless of lighting conditions.

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single compartment

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single differential float

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single grain

Soil structure descriptor for soil consisting of non-coherent individual particles (e.g., loose sand).

---

single pass coir filter

Flow configuration wherein effluent moves through a coir media filter only once.

---

single pass media filter

Flow configuration wherein effluent moves through a media filter only once.

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single pass peat filter

Flow configuration wherein effluent moves through a peat media filter only once.

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single pass sand filter

Flow configuration wherein effluent moves through a sand media filter only once.

---

siphon

Device used for demand dosing effluent from a tank at a given elevation to a component at a lower elevation, accomplished by means of suction created by the weight of the liquid in the conveying pipe.

---

siphon tank

Dosing tank or compartment which provides storage of effluent and contains a siphon to convey effluent from the tank to another pretreatment process or to a final treatment and dispersal component.

---

site drainage

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site evaluation

Description and evaluation of soil characteristics (morphology, including structure, texture, and mineralogy; depth to limiting condition such as seasonal wetness; unsuitable soil structure or rock); site characteristics (including topography and landscape position) and site features requiring setback distances (wells, water lines, structures, property lines, surface water, drainage and easements) and who performs any other activities necessary to determine site suitability for effective treatment and dispersal of effluent.

---

site evaluator

Service provider who conducts preconstruction site visits to describe and evaluate soil characteristics (morphology, including structure, texture, and mineralogy; depth to limiting condition such as seasonal wetness; unsuitable soil structure or rock); site characteristics (including topography and landscape position) and site features requiring setback distances (wells, water lines, structures, property lines, surface water, drainage and easements) and who performs any other activities necessary to determine site suitability for effective treatment and dispersal of effluent.

---

site plan

Plan-view drawing that provides a graphical representation of existing and proposed natural and manmade physical features on a site.

---

site restoration

Reconstitution of the surface of a site to approach as nearly as possible the original grade and vegetative cover.

siting

slag

Bottom ash (a by-product of coal-fired power plants), the coarse fraction of which may be used as distribution media.

sleeve

slickensides

Stress surfaces in soil that are polished and striated and are produced by one mass sliding past another.

slope

1. Ratio of the rise divided by the run between two points, typically described as a percentage (rise/run multiplied by 100). 2. Landscape form or feature; see also slope, concave; slope, convex; and slope, linear.

slope break

Configuration for piping installed on steep slopes to slow the flow coming from the structure to the first tank; typically includes the installation of cleanouts to prevent obstruction.

slope shape

slope stake

In earthwork, a stake marking the line where a cut or fill meets the original grade.

sloping (sloping system)

Method of protecting personnel by excavating in a manner to form sides that are inclined away from the excavation to prevent cave-ins; the angle of incline required to prevent a cave-in varies with the soil type, environmental conditions of exposure, and application of surcharge loads.

sloping site

sloughing

Shedding material (typically biofilm) from the surface of media.

sludge

Accumulated solids and associated entrained water within a pretreatment component, generated during the biological, physical, or chemical treatment; coagulation; or clarification of wastewater.

sludge pipe

sludge recycling

sludge return

Process that sends the material (sludge) settled in a clarifier back to a septic or processing tank for further treatment or to maintain adequate microbial populations for treatment.

sludge return pump

soft malfunction

Component malfunction that does not disrupt overall system performance and can typically be corrected via maintenance or operational activities.

soil

1. Unconsolidated mineral and/or organic material on the immediate surface of the earth that serves as a medium for the growth of plants; 2. Unconsolidated mineral or organic matter on the surface of the earth that has been subjected to and shows effects of pedogenic and environmental factors of climate (including water and temperature effects), and macro- and microorganisms, conditioned by relief, acting on parent material over a period.

---

soil absorption field

See soil treatment area (STA).

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soil consistence

Attribute of soil expressed in degree of cohesion and adhesion, or in resistance to deformation or rupture; consistence includes: the resistance of soil material to rupture, resistance to penetration, the plasticity, toughness, or stickiness of puddled soil material, and the manner in which the soil material behaves when subjected to compression; general classifications of soil consistence include loose, friable, very friable, firm, very firm, and extremely firm.

---

soil horizon

Layer of soil or soil material approximately parallel to the land surface and differing from adjacent related layers in physical, chemical, and biological properties or characteristics such as color, structure, texture, consistence, kinds and number of organisms present, degree of acidity or alkalinity, etc.

---

soil morphology

1. Physical constitution of a soil profile as exhibited by the kinds, thickness, and arrangement of the horizons in the profile; and by the texture, structure, consistence, and porosity of each horizon; 2. Visible characteristics of the soil or any of its parts.

---

soil mottles

Subordinate color in a soil horizon of a differing Munsell Color System notation; see also redoximorphic feature.

---

soil porosity

Volume percentage of the total bulk not occupied by solid particles.

---

soil profile

Vertical section of the soil through all its horizons and extending into the parent material.

---

soil separate

Mineral particle that is sand-, silt-, or clay-sized.

---

soil smearing

Degradation of the infiltrative surface through the sealing of soil pores.

---

soil structure

Combination or arrangement of primary soil particles into secondary units or peds; secondary units are characterized on the basis of shape, size class, and grade (degree of distinctness); see also structureless.

---

soil substitution

Trench or bed installed after native soil is excavated and replaced with approved soil material; configurations and terminology vary among jurisdictions; may be referred to locally as sand-lined trenches, liner systems, etc.

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soil substitution bed

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soil substitution trench

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soil textural class

Percentage by weight of sand, silt, and clay such that each class possesses unique physical characteristics and management relative to the other textural classes; textural class names are modified by the addition of suitable adjectives when rock fragments are present in substantial amounts (for example, ‘stony silt loam’); see also soil classification system, OSHA.

---

soil texture

Relative proportions by weight of the various inorganic primary particles in a soil as described by the classes of soil texture.

---

soil treatment area

Physical location and associated structures (trenches, beds, fields, as appropriate) and distribution piping where final treatment and dispersal of effluent occurs.

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solenoid

Electro-magnetically operated mechanical device (electric coil); see also valve, solenoid.

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solenoid valve

Valve that uses an electro-magnetically operated mechanical device (electric coil) to turn on, shut off, or regulate the flow of effluent.

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solids

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solids handling

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solids storage

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solids transport

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sorption

Removal of an ion or molecule from solution by adsorption and/or absorption; term often used when the exact nature of the mechanism of removal is not known.

---

source

Residence, business, institution or other facility where wastewater is generated.

---

spalling

Condition in which the surface of a concrete component is physically degraded (flaking), exposing aggregate and/or structural reinforcement materials.

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spillway

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spin filter

See screen filter.

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spirit level

Device for determining true horizontal or vertical directions by the centering of a bubble in a slightly curved glass tube or tubes filled with alcohol or ether.

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splash plate

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splash pool

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split base

Method of dividing effluent flowing through a recirculating media filter using a physical barrier in the bottom of the filter resulting in multiple discharge locations.

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splitter ball valve

See recirculating splitter valve (RSV).

---

spodic horizon

Diagnostic subsurface horizon characterized by the illuvial accumulation of amorphous materials composed of aluminum and organic carbon with or without iron.

spoil

Soil removed from its original location, typically stacked in a pile and may be reused.

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spray

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spray dispersal

Application of effluent over a soil treatment area via sprinkler heads and associated devices and parts (including pump, filters, controls, and piping).

---

spray distribution

Pressurized distribution system that delivers treated effluent over an infiltrative surface through a network of piping, pressurized nozzles and associated devices.

---

spray field

Above-grade soil treatment area where final treatment and dispersal occurs via application of effluent to the infiltrative surface via pressurized distribution heads utilizing nozzles.

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spray heads

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spray pattern

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spring

Groundwater seeping out of the earth where the water table intersects the ground surface.

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spring check valve

Non-return valve in which a spring causes a disc to seat against an opening within a cylindrical fluid line and stops flow.

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spring line

Horizontal axis defined by the greatest width dimension of piping, conduit, tank, or other structure; see diagram at bedding.

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sprinkler heads

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squirt height

Height achieved by the liquid in a pressurized lateral when an orifice is positioned such that the discharge is vertical into the atmosphere, typically expressed in feet of height.

---

stabilize

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stable rock

Natural solid mineral material that can be excavated with vertical sides and will remain intact while exposed; unstable rock is considered to be stable when the rock material on the side or sides of the excavation is secured against caving-in or movement by rock bolts or by another protective system that has been designed by a registered professional engineer.

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stake

1. Stout stick or post sharpened at one end and driven into the earth as a support or boundary marker. 2. Action of placing stakes on the perimeter of a property or a portion thereof to establish visible boundaries.

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standard dimensional ratio (SDR)

Piping specification based upon the ratio of pipe diameter to wall thickness

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standard methods

Shortened title for the Standard Methods for the Examination of Water and Wastewater, a joint publication of the American Public Health Association, American Water Works Association, and Water Pollution Control Federation; widely-used manual that outlines the procedures used to analyze water and wastewater impurities and characteristics.

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standpipe

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startup

Setting of operational controls, verification of component function, documentation of initial operating conditions of a system, and establishment of microbial populations for biological treatment.

---

static head

Fixed component of total dynamic head (TDH); expressed as the sum of elevation head and operating pressure; see also operating pressure.

---

static plow

Plow shank used for installing subsurface drip tubing; typically a disc leads the shank to cut the soil, grass, and other debris prior to shank passage.

---

station

Point where a rod reading is taken; points along the line of a survey; stations are usually marked with a peg or wood stake, or in grade settling, marked with a grade stake.

STEG

See septic tank effluent gravity.

STEP

See septic tank effluent pump.

---

stepdown

Device used to connect a trench at a certain elevation to the next trench at a lower elevation; can be used as a relief line in sequential or serial distribution; see also cross-over pipe and relief device.

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storage

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storage lagoon

Lagoon where some form of wastewater is stored before it is either conveyed to another component for further processing or is reused.

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storage volume

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stormwater

Runoff resulting from precipitation.

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straight pipe

Conduit used to convey wastewater either directly from the source or following septic tank pretreatment to the land surface or a water body; term that often indicates an illegal discharge without treatment.

---

stream discharge

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structural ramp

Ramp built of steel or wood, usually used for vehicle access; ramps made of soil or rock are not considered structural ramps.

---

structure

structureless

Group of soil structures recognized in the Field Book for Describing and Sampling Soils (Schoenberger, et al, 2002); includes three subcategories that essentially have no structural units: single grain (entirely non-coherent; e.g. loose sand), massive (material is a coherent mass {not necessarily cemented}, no secondary pores), and massive - rock controlled fabric (coherent mass with the original rock fabric still identifiable).

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strut

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sub-horizons

---

sub-main line

Portion of the main line located after a flow splitter that carries a portion of flow to a spray dispersal field.

---

subangular blocky

See blocky.

---

submain

See sub-main line.

---

submerged flow constructed wetland system

constructed wetland in which wastewater passes through the component below the surface of the media.

---

submerged soil

soil which is underwater or is freely seeping.

---

submersible pump

pump with a hermetically sealed motor close-coupled to the pump housing, designed to be placed entirely below the surface of the liquid to be pumped.

---

subsoil

---

subsurface discharge

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subsurface drain

underground conduit used to collect and convey surface or groundwater.

---

subsurface drip field

drip field designed and installed such that the drip tubing is located at least 6” below finished grade of native soil.

---

subsurface wastewater infiltration system (SWIS)

see soil treatment area (STA).

---

suitable fill

---

summit

a general term for the highest point of any landform remanant, hill, or mountain.

---

sump

---

sump tank

tank or pit that receives drainage of groundwater or runoff, stores it temporarily, and from which the discharge is pumped.

---

supply line

piping between a source of effluent and the associated gravity-flow or pressure distribution system.

---

supply manifold

manifold that allows effluent to be distributed to two or more laterals.

---

support system

structure such as underpinning, bracing, or shoring, which provides support to an adjacent structure, underground installation, or the sides of an excavation.

---

surface application

---

surface discharge

---

surface diversion

natural or constructed drainage feature used to divert runon and/or collect runoff and direct it to an effective outlet; see also swale and berm.

---

surface drip field

drip field designed and installed such that the drip tubing is located at the finished grade of the soil surface.

---

surface runoff

see runoff.

---

surface water

any body of water, whether fresh or marine, flowing or contained in natural or artificial, lined or unlined depressions for significant periods of the year; includes natural and artificial lakes, ponds, springs, rivers, streams, wetlands, and tidal waters.

---

surge

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surge flow

flow of effluent that occurs in a short enough period that it upsets the function of one or more components of the treatment train.

---

surge tank

see flow equalization tank.

---

surge volume

1. volume above the average daily volume and below the reserve volume in a flow equalization tank; 2. volume of effluent in excess of average daily flow.

---

survey

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surveying

determining the dimensions and contour (or three-dimensional characteristics) of the earth's surface by the measurement of distances, directions and elevations.

---

suspended growth

microorganisms maintained in suspension within a liquid; see also suspended growth process.

---

suspended growth process

configuration wherein the microorganisms that provide treatment are maintained in suspension within a liquid; see also attached growth process.

suspended solids

that portion of total solids that is retained on a filter of 2.0 µm (or smaller) nominal pore sized under specified conditions.

---

swale

natural or constructed elongated, sloped depressional drainage feature used to collect runoff and direct the flow to an effective outlet to prevent runon downslope; often used in conjunction with a berm; *see also* **berm**.

---

sweep elbow

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swing check valve

non-return valve in which a hinged flapper seats against an opening within a cylindrical fluid line and stops flow.

---

swing joint

---

swing joint riser

piping and connections used to adjust the elevation of and isolate spray distribution heads from the lateral in a spray dispersal system.

---

swing ties

distance from two fixed points to locate a system component.

---

switching valve

valve used to manually or automatically direct flow from one final treatment and dispersal component to another.

---

system

assembly of components and processes; see also treatment train.

---

system curve

graphical method that describes the relationship between total dynamic head and flow in a system under operating conditions.

---

system management

complete range of activities necessary to conduct operational services on wastewater treatment systems, including inspection, operation, maintenance, monitoring, and compensation.

---

tablet feeder

---

tabulated data

information displayed in tables and charts, approved by a registered professional engineer, and used to design and construct a protective system.

---

take-off

activities related to preparing to bid a system installation including reading blueprints and specifications; making notes of special details concerning the project after gathering the necessary information; and estimating the quantities of labor, materials, equipment and special items needed to complete the job.

---

tank

watertight structure or container used to hold wastewater for such purposes as aeration, equalization, holding, sedimentation, treatment, mixing, dilution, or addition of chemicals, or disinfection.

---

tank capacity

1. regarding a septic tank, volume in gallons as measured from the bottom of the tank to the invert of the outlet piping; 2. regarding a dosing tank, volume as measured from the bottom of the tank to the invert of the inlet.

tank volume

total volume of a tank from the inside bottom of the tank to the inside top of a tank; see also tank capacity.

tanks in series

tee

telematics

integration of telecommunications and informatics (information analytics) technology to monitor and manage assets.

telemetry

remote communication of system status, typically incorporating an auto-dialing notification feature.

tertiary treatment

advanced treatment of wastewater for enhanced organic matter removal, pathogen reduction, and nutrient removal; typical standards for tertiary effluent vary according to regulatory requirements.

textile filter

type of media filter which uses non-rigid, synthetic material of varying shapes and configurations as the media; typically packaged as prefabricated modular units.

textural triangle

texture

thermophilic bacteria

bacteria which grow best at temperatures between 35- and 75- degrees C (95- and 167- degrees F) with optimum growth between 55- and 65- degrees C (131- and 149- F).

three-float configuration

1. A liquid level sensing arrangement in a simplex pumping system using three float switches: a float switch assembly consisting of an on float (activation) and an off float (deactivation) for pump operation and a single differential float switch for high water alarm activation; 2. A liquid level sensing arrangement in a multiplex pumping system using three single differential float switches: a stop float switch, a lead float switch and a lag/alarm float switch for lag pump activation and high water alarm activation.

thrust block

rough pore of concrete installed on the outside of an angled fitting (tee, cross, elbow or valve) that extends back to the native soil to provide a greater bearing surface and prevent loosening of joints due to stress created in pressurized applications.

tile

tile drainage

large-scale subsurface drainage system designed for lowering groundwater for agricultural purposes.

time dosing

configuration in which a specific volume of effluent is delivered to a component based upon a prescribed interval, regardless of facility water use; see also flow equalization.

timer

controller for automatically starting and/or stopping a device at a given interval.

timer enable

operating parameter that allows pump operation via a specified schedule; see also peak enable and redundant off.

---

timer override

operating parameter under which a sensor directly activates the pump when the effluent level reaches a preset, excessively high level; pump operation continues in essentially demand mode until the effluent drops below the override sensor off elevation; the primary timer remains engaged but does not control activation until override sensor drops out; the timer override sensor operates on a demand basis.

---

toe slope

the hillslope position that forms a gently inclined surface at the base of a slope. Toeslopes in profile are commonly gentle and linear, and are constructional surfaces forming the lower part of a slope continuum that grades to a valley or closed depression (Hawley and Parsons, 1980). Compare summit, shoulder, backslope, footslope, valley floor.

---

toilet

fixture used for defecation and urination.

---

top feed manifold

configuration in which a short manifold is installed at the higher elevation of a soil treatment area.

---

topographic map

plotted form of information gained through a topographic survey.

---

topographic plan

see topographic survey.

---

topographic survey

survey made for locating objects and measuring the relief, roughness, or three-dimensional variations of the earth's surface; detailed information is obtained pertaining to elevations as well as to the locations of man-made and natural features (buildings, roads, streams, etc.); also known as a topographic map.

---

topography

physical features of the land surface including relative elevations and geometry.

---

topsoil

---

total coliform (TC)

measurement of water quality expressed as the number of colony-forming units (CFU) of coliform bacteria per unit volume; see also colony-forming unit (CFU) and heterotrophic plate count.

---

total dissolved solids (TDS)

material that passes through a filter of 2.0 µm (or smaller) nominal pore size, evaporated to dryness in a weighed dish and subsequently dried to constant weight at 180 degrees C; typically expressed in mg/L.

---

total dynamic head (TDH)

measure of the cumulative energy that a pump must impart to a liquid to move it from one point to another, consisting of the sum of friction head (as based upon piping diameter, system configuration, and flow rate) and static head (the sum of elevation head and operating pressure); see also friction head, static head, and operating pressure.

---

total Kjeldahl nitrogen (TKN)

measure of the total concentration of organic nitrogen, ammonia (NH_3), and ammonium nitrogen (NH_4^+).

---

total nitrogen

measure of the complete nitrogen content in wastewater including nitrate (NO_3^-), nitrite (NO_2^-), ammonia (NH_3), ammonium (NH_4^+), and organic nitrogen, expressed as mg/L of N; all these forms of nitrogen, (as well as nitrogen gas [N_2]), can be biochemically converted from one form to another and are constituents

of the nitrogen cycle.

---

total organic carbon (TOC)

measure of the concentration of organic carbon determined by oxidation of the organic matter into carbon dioxide (CO_2) typically expressed in mg/L.

---

total phosphorus (TP)

sum of all forms of phosphorus in effluent.

---

total solids (TS)

material residue left in a vessel after evaporation of a sample after drying to a constant weight in an oven at 217 to 221 degrees F (103 to 105 degrees C); includes total suspended solids (TSS) and total dissolved solids (TDS); typically expressed in mg/L.

---

total suspended solids (TSS)

measure of all suspended solids in a liquid, typically expressed in mg/L; to measure, a well-mixed sample is filtered through a standard glass fiber filter and the residue retained on the filter is dried to a constant weight at 217 to 221 degrees F (103 to 105 degrees C); the increase in the weight of the filter represents the amount of total suspended solids.

---

toxic event

sudden introduction of a substance or substances that impair or destroy biological activity within a wastewater treatment process.

---

trace organic contaminant (TOrC)

organic compounds originating from residential and non-residential sources, such as ingredients in drugs, pesticides, consumer products, and industrial process agents (usually present in concentrations much lower than one mg/L) which may have adverse ecological and/or human health effects; see also pharmaceutical and personal care products.

---

tracked

propulsion method using tracks, typically resulting in lesser ground pressure due to broader soil contact area; see also wheeled.

---

transducer

mechanical device that converts air or water pressure to a proportional electrical current.

---

transfer benchmark

local bench mark established from a referenced bench mark.

---

transpiration

process by which plants release water vapor to the air.

---

trash tank

optional first component of a wastewater treatment system, often used with a proprietary aerobic treatment unit (ATU), typically having a limited detention time, and used to remove larger items or inorganic material in the wastewater stream; trash tanks provide limited anaerobic treatment.

---

treatment

method, technique, or process designed to remove solids and/or pollutants from wastewater prior to conveyance to a final treatment and dispersal component or reuse; often, this treatment is designed to meet a primary, secondary, tertiary, and/or disinfection treatment standard; includes pretreatment and advanced treatment.

---

treatment media

non- or slowly-degradable media used for physical, chemical, and/or biological treatment in a wastewater treatment component.

---

treatment processes

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treatment train

site-specific combination of components in a specified order that constitute a wastewater treatment system; a simple example of a treatment train is a septic tank and a soil treatment area.

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treatment volume

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trench

1. soil treatment area (STA) configuration consisting of an excavation with a width of 3 feet or less containing distribution media and one lateral; 2. below-grade soil treatment area consisting of one or more trenches installed in an excavation such that the bottom of the infiltrative surface is typically 18 to 36 inches below original ground elevation; utilizes pressure or gravity distribution; a cover of suitable soil stabilizes the final grade, supports vegetative growth and sheds runoff; 3. excavation in the soil for drainage diversion; 4. excavation for placement of piping, electrical wire or conduit; see also trench excavation.

---

trench (trench excavation)

narrow excavation (in relation to its length) made below the surface of the ground; in general, the depth is greater than the width, but the width of a trench (measured at the bottom) is not greater than 15 feet (4.6 m). if forms or other structures are installed or constructed in an excavation so as to reduce the dimension measured from the forms or structure to the side of the excavation to 15 feet (4.6 m) or less (measured at the bottom of the excavation), the excavation is also considered to be a trench.

---

trench box

see shield.

---

trench shield

see shield.

---

trencher

machine that uses a chain with attached cutters to open a trench by cutting, removing, and depositing spoil to the side of the trench or onto a discharge conveyor.

---

trickling filter

type of media filter which uses a variety of media such as rigid plastics of varying shapes, stone, or tire chips; includes a clarifier in its configuration and may include a recirculation mode.

---

troubleshooting

act of identifying and correcting the root causes of system malfunction.

---

turbidity

relative clarity of effluent due to the presence of varying amounts of suspended organic and inorganic materials or color.

---

turbine pump

centrifugal pump with a curved volute that causes liquid to discharge along the centerline of the impeller; *see also* multi-stage pump.

---

turning point (TP)

temporary point on which rod readings are taken to move the leveling instrument along a survey path; a foresight (FS or +) is taken on the turning point to obtain its elevation (initially, elevation of turning point is unknown); the instrument is then moved from its position and set up at a new position beyond the turning point; a backsight (BS or +) is then taken on the turning point to determine the height of the instrument (HI); the turning point must be a firm object, such as a stone, stake, pipe, fence post, or axe head so that the elevation will not change while the instrument is being moved; if the turning point is altered while the instrument is being moved, the survey must go back to the last permanent point of known elevation (i.e., a bench mark).

---

two-compartment

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two-float configuration

a liquid level sensing arrangement in a simplex pumping system using two single differential float switches: one for pump operation (both activation and deactivation) and a second for high water alarm activation.

---

two-stage

Type 4X enclosure

Enclosures constructed for either indoor or outdoor use to provide a degree of protection to personnel against access to hazardous parts; to provide a degree of protection of the equipment inside the enclosure against ingress of solid foreign objects (falling dirt and windblown dust); to provide a degree of protection with respect to harmful effects on the equipment due to the ingress of water (rain, sleet, snow, splashing water, and hose-directed water); that provides an increased level of protection against corrosion; and that will be undamaged by the external formation of ice on the enclosure.

Type A

OSHA soil classification that includes cohesive soils with an unconfined compressive strength of 1.5 ton per square foot (TSF) (144 kPa) or greater; examples of cohesive soils are: clay, silty clay, sandy clay, clay loam and, in some cases, silty clay loam and sandy clay loam; cemented soils such as caliche and hardpan are also considered Type A; however, no soil is Type A if: (i) the soil is fissured; or (ii) the soil is subject to vibration from heavy traffic, pile driving, or similar effects; or (iii) the soil has been previously disturbed; or (iv) the soil is part of a sloped, layered system where the layers dip into the excavation on a slope of four horizontal to one vertical (4H:1V) or greater; or (v) the material is subject to other factors that would require it to be classified as a less stable material.

Type B

OSHA soil classification that includes cohesive soil with (i) an unconfined compressive strength greater than 0.5 TSF (48 kPa) but less than 1.5 TSF (144 kPa); or (ii) granular cohesionless soils including: angular gravel (similar to crushed rock), silt, silt loam, sandy loam and, in some cases, silty clay loam and sandy clay loam. (iii) previously disturbed soils except those which would otherwise be classed as Type C soil. (iv) soil that meets the unconfined compressive strength or cementation requirements for Type A, but is fissured or subject to vibration; or (v) dry rock that is not stable; or (vi) material that is part of a sloped, layered system where the layers dip into the excavation on a slope less steep than four horizontal to one vertical (4H:1V), but only if the material would otherwise be classified as Type B.

Type C

OSHA soil classification that includes cohesive soil with (i) an unconfined compressive strength of 0.5 TSF (48 kPa) or less; or (ii) granular soils including gravel, sand, and loamy sand; or (iii) submerged soil or soil from which water is freely seeping; or (iv) Submerged rock that is not stable, or (v) material in a sloped, layered system where the layers dip into the excavation or a slope of four horizontal to one vertical (4H:1V) or steeper.

Type III MSD

US Coast Guard approved Marine Sanitation Device that is designed to simply hold waste material for pump-out into a shore-based facility, also known as a holding tank which performs no treatment; see also holding tank.

---

ultimate biochemical oxygen demand (uBOD)

oxygen required to complete the oxidation, synthesis, and endogenous respiration in a sample of wastewater; see also five day biochemical oxygen demand.

---

ultrasonic

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ultrasonic sensor

device that measures depth to liquid level by transmitting and receiving sound waves.

---

ultraviolet (UV) light

light waves beyond the visible spectrum; used for disinfection of water and wastewater; see also disinfection

---

ultraviolet (UV) light disinfection

physical process used to inactivate microorganisms by irradiating them with ultraviolet light (254-nm germicidal wavelength) to disrupt their metabolic activity, thus rendering them incapable of reproduction; see also ultraviolet.

---

unacceptable

condition in which a component or system is not operating as intended, indicating a need to implement maintenance, upgrades, repairs, or further investigation; see also acceptable and malfunction.

---

unconfined compressive strength

load per unit area at which a soil will fail in compression; determined by laboratory testing, field estimation using a pocket penetrometer, thumb penetration tests, and other methods.

---

underdrain

perforated pipe located below the media of a media filter; designed to collect treated effluent.

uniform distribution

concept of distributing effluent evenly over the surface of a component over both time and space.

---

uniformity coefficient

description or specification of particle size distribution calculated by dividing the diameter of particle (millimeters) of which 60% by weight is smaller, by the diameter of particle (millimeters) of which 10% by weight is smaller; expressed mathematically as D60/D10; see also particle size distribution.

---

uniformly graded

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union

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unlined

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unlined evapotranspiration (ET) bed

dispersal component with an unlined bed using evaporation, transpiration, and adsorption for dispersal of effluent with an unlined bed; sometimes called an evapotranspiration/infiltration (ETI) bed.

---

unsaturated

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unsaturated flow

movement of water in a porous soil or media that is not filled to capacity with water; the water flow is along the surface of the particles, allowing air and gases to move through the interior of the larger pore space.

---

unsaturated soil

soil in which the pore spaces contain water at less than atmospheric pressure; typically, smaller pore spaces contain water because of tension and larger pore spaces contain air and other gases.

---

upflow filter

see anaerobic upflow filter.

---

upgrade

improving a system by adding a device or component (or replacing a given device or component with one of higher quality) to increase the system's effectiveness or facilitate operation and maintenance.

---

uprights

vertical members of a trench shoring system placed in contact with the earth and usually positioned so that individual members do not contact each other. uprights placed so that individual members are closely spaced, in contact with or interconnected to each other, are often called "sheeting."

---

urine

aqueous fluid containing urea and other materials generally exiting via the human urogenital pathway.

---

urine-separating device

toilet fixture designed to separate urine from other waste materials.

UV lamp

---

vacuum breaker

device used to facilitate air entry during depressurization; also called an air/vacuum release valve; see also air/vacuum release valve.

---

vacuum breaker valve

valve that serves as a type of backflow-prevention device that prevents cross-contamination by reverse flow; see also air/vacuum release valve.

---

vacuum inches

measurement of the suction produced in a vacuum system relative to ambient atmospheric pressure.

---

vacuum pump

pump that removes air from a cargo tank to create a vacuum (or partial vacuum); may also be operated in reverse mode to produce pressure.

---

vacuum relief

process of allowing air entry into a component to relieve a vacuum condition.

---

vacuum relief valve

valve that limits the vacuum level in a vacuum cargo tank (or suction line) to a preset level by allowing air to enter, thereby assuring that the operating vacuum level is not exceeded.

---

vacuum sewer

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vacuum sewer basin

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vacuum truck

motorized vehicle equipped with a vacuum system consisting of vacuum pump, cargo tank and associated equipment.

---

vadose zone

aerated, unsaturated region of soil above the zone of saturation.

---

value

one of the three variables of color, described as the degree of lightness or darkness of the color in relation to a neutral gray scale; on a neutral gray scale, value extends from pure black to pure white; see also Munsell Color System; hue; and chroma.

---

valve

mechanical device used to close off, regulate, or divert the flow of fluid.

---

valve box

housing that encloses an operating component or device and extends to the ground surface, allowing access for component inspection, operation, etc.

---

valve throttling

controlling or modulating flow through a system by manually or automatically opening or closing a valve to various degrees; in a pump system, changing the valve to various positions between full open and full closed regulates the amount of flow delivered and the operating pressure or head.

---

vault

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vault toilet

waterless toilet mounted on a vented holding tank designed to store non-water-carried human waste prior to offsite treatment.

---

vent

device that allows the active or passive entrance or exit of gases from a component.

---

vertical separation

vertical distance between the infiltrative surface and a limiting condition, such as highest groundwater level, bedrock, etc.

vertical trench

trench installed with 4 or more feet of distribution media below the lateral.

---

vibratory compactor

mechanical device such as a jumping jack that consolidates loose soil material.

---

vibratory plow

oscillating plow shank used for installing subsurface drip tubing and utility lines.

---

virus

an obligate parasite dependent on a host cell for its metabolic and reproductive needs; a constituent of concern in biological wastewater treatment systems.

---

volatile

capable of evaporating at relatively low temperatures.

---

volatile organic compound (VOC)

class of organic compounds that readily evaporates; includes liquids and solids at natural environmental temperature; examples include solvents, adhesives and fuels).

---

volatile solids

weight loss on ignition of total solids, not distinguishing between inorganic and organic matter, and including loss due to decomposition or volatilization of some mineral salts at 1,022 degrees F (550 degrees C).

---

voltage

the electric potential difference between two points, which causes the movement of electric charge.

---

volume

1. the amount of space that a liquid or solid object occupies, typically measured in cubic units; 2. the space occupied within the boundaries of an object (such as a tank, chamber or compartment) in three-dimensional space; typically measured in cubic units; also known as the capacity of the object.

---

volumetric

of or pertaining to measurement by volume.

---

volute

spiral-shaped casing which surrounds a pump, blower, or turbine impeller and collects the liquid or gas discharged by the impeller.

---

vortex pump

centrifugal pump using a recessed impeller designed to create a whirlpool within the pump casing to convey solids with minimal contact.

---

wales

horizontal members of a shoring system placed parallel to the excavation face whose sides bear against the vertical members of the shoring system or earth.

---

washed rock

clean graded media of specified size range, offering a minimum specified void space, having a hardness value of three or greater on the Moh's scale of hardness (can scratch a copper penny), prepared to be relatively free of fine materials that might otherwise impair absorption area performance; placed on the infiltrative surface.

---

wasted activated sludge

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wastewater

clear water, stormwater, industrial, sewage (domestic or commercial), or any combination thereof, carried by water.

---

wastewater reclamation

treatment or processing of wastewater to produce water of a quality appropriate for another use, including recycling or reuse; see also wastewater recycling and wastewater reuse.

---

wastewater recycling

reclamation process of collection and treatment of wastewater on-site for return and use back into the same site; for example, collection and reclamation of graywater from an establishment for subsequent toilet flushing in that same establishment; see also wastewater reuse.

---

wastewater reuse

reclamation process of collection and treatment of wastewater for the deliberate application of that treated wastewater for a beneficial purpose such as turf irrigation; see also wastewater recycling.

---

wastewater stabilization pond

constructed basin lined with either soil with very low permeability or a synthetic material, surrounded with berms and which contains at least three feet of wastewater which utilizes sunlight, wind or mechanical aeration, and natural bacteria to break down waste via physical, chemical and biological processes to stabilize wastewater; typically consists of two or more basins with operational controls allowing or facilitating flow through the basins.

---

wastewater treatment system

assembly of components for collection, treatment and dispersal of sewage or effluent.

---

wasting

process of removing biomass from activated sludge in the pretreatment process.

---

water conservation

management of water resources to eliminate waste or maximize efficiency utilizing such methods as using the same water again before it becomes wastewater, installing water-efficient plumbing, or wastewater recycling and reuse.

---

water flow

---

water level control

---

water movement

---

water packing

method of settling backfill using water.

---

water quality-based performance standard

specific, measurable, and enforceable standard that establishes limits and measurement frequency for pollutant concentrations or mass loads in treated wastewater discharged to groundwater or surface water.

---

water softener

component that removes hardness from a water source.

---

water softening

reduction in the number of and/or removal of polyvalent cations which are the principal cause of hardness in water.

---

water table

upper surface of groundwater or that level in the ground where the water is at atmospheric pressure.

water treatment discharge

by-product from a water treatment device, such as regeneration water from an ion-exchange unit, reject water from a reverse-osmosis unit, or the backwash from an iron filter.

---

water well

well constructed for the purpose of extracting potable water at a beneficial rate.

---

waterless toilet

toilet specifically designed to receive non-water-carried human waste; includes chemical, composting, pit, and vault toilets.

---

watershed

drainage basin area contained within the bounds specified by a divide and above a specified point such as a lake, wetland, or stream.

---

watertight

condition ascribed to a device that is constructed so that no water can move into or out of it except by design through inlets and outlets.

---

wedge

soil structure descriptor for soil aggregates with wedge-shaped blocks that are larger at the top and narrow at the bottom.

---

weep hole

1. drain hole to allow moisture or air to escape, such as a weep hole in a concrete tank that allows water to drain out of tanks while they are in storage; 2. drain hole in the discharge assembly that allows drainback to the tank after a dosing event.

---

weir

device designed to measure or control flow; consists of a wall or obstruction of known geometric shape placed perpendicular to the direction of flow.

---

well

shaft bored or drilled into the ground for purposes of accessing a saturated zone.

---

well screen

device with perforations that restricts entry of soil particles while facilitating free drainage of liquid into the well.

---

well-graded

material of variable size with minimum pore space; also known as poorly-sorted.

---

well-sorted

material of uniform size with maximum void space; also known as poorly-graded.

---

wet soil

soil that contains significantly more moisture than moist soil, but in such a range of values that cohesive material will slump or begin to flow when vibrated; granular material that would exhibit cohesive properties when moist will lose those cohesive properties when wet.

---

wetlands

areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions; wetlands generally include swamps, marshes, bogs, and similar areas; constructed wetlands used in wastewater treatment are purposely excluded.

---

wheeled

propulsion method using wheels, typically resulting in greater ground pressure due to limited soil contact area; see also tracked.

wick

wicking

unsaturated flow on the surface of a media or soil particles which moves liquid from a location of greater moisture content to a location with lesser moisture content.

wind action

air movement across the liquid surface of a constructed wetland, lagoon or other exposed treatment tank or over a soil treatment area.

window of acceptance

trench; conventional trench; distribution media; biomat; biozone

Wisconsin mound

see mound.

yellow water

isolated waste stream consisting of urine collected from specific fixtures and not contaminated by feces or diluted by graywater sources; see also urine separating device.

zone

portion of a component that is separately managed as a single unit.

zone of aeration

see vadose zone.

zone of dispersal

layers of soil or rock material surrounding the zone of treatment through which the effluent moves away from the final treatment and dispersal component.

zone of saturation

layer in the ground in which interstitial voids (cracks, crevices, holes, etc.) are filled with water; the level at the top of this zone is the water table.

zone of treatment

see biozone.

zone valve

valve that mechanically and sequentially diverts the flow of fluid to multiple zones within a soil treatment area.

zoogleal mass

jelly-like masses of bacteria found in both the trickling filter and activated sludge processes; masses may be formed for or function as the protection against predators and for storage of food supplies.