

Glossary of Terms used in the Stormwater Industry

Term	Code	Definition
Macrograzer	Eco	An organism that feeds on relatively large particles.
Macroinvertebrates	Eco	Small but non-microscopic fauna without backbones, including a number of insect species that spend at part of their lifecycle in water.
Macrophyte	Bot	A type of water plant that is not microscopic algae.
Main drain	Sto	The primary channel, pipe, or overland flow path that drains a catchment area.
Maintenance	Eng	Routine work required to maintain existing works and systems in a safe and functional condition.
Major design storm	Hyd	The rainfall event for the ARI chosen for the design of the major drainage system.
Major drainage system	Sto	The part of the overall drainage system that controls flows greater than those controlled by the minor drainage system and up to and including flows from the major design storm.
Major drainageway	Sto	A readily recognisable natural or modified channel that conveys runoff that is beyond the capacity of the minor drainage system; it includes emergency overflow facilities.
Major GPT	Sto	An open gross pollutant trap consisting of a combined sediment basin and trash rack usually located at the downstream end of a stormwater pipe network or constructed drainage channel.
Major overland flow path	Sto	An overland flow path that drains water from more than one property, has no suitable flow bypass, and has a water depth in excess of 75mm during the major design storm.
Major road	Eng	A road whose primary function is to serve through traffic, includes collector roads, sub-arterial and arterial roads.
Major storm	Hyd	The design storm with an average recurrence interval selected on the basis of satisfying requirements for flood immunity and safety and an average rainfall intensity equivalent to that adopted for the design of the major drainage system.
Major system	—	See MAJOR DRAINAGE SYSTEM.
Manhole	Eng	An opening constructed in a structure to permit human access for the purpose of construction, inspection and/or maintenance. This term is being replaced by ACCESS HOLE or ACCESS CHAMBER.
	Sto	A stormwater pipe junction pit that allows human access for construction, inspections and/or maintenance.
Manning's coefficient	—	See MANNING'S ROUGHNESS COEFFICIENT.

Manning's formula	Hyd	<p>A formula used to predict the velocity of uniform fluid (water) flow in an open channel or other conduit.</p> $V = (1/n) \cdot R^{2/3} \cdot S^{1/2} \quad (\text{Metric SI units})$ <p>where:</p> <p>V = mean velocity of flow [metres/seconds]</p> <p>R = hydraulic radius [metres]</p> <p>S = channel slope [metres/metre]</p> <p>n = Manning's roughness coefficient of the channel lining [dimensionless]</p> <p>Note the coefficient '1.0' is assumed to have units of [m^{1/3}/s] and therefore converts to 1.486 in English units, thus:</p> $V = (1.486/n) \cdot R^{2/3} \cdot S^{1/2} \quad (\text{English units})$
Manning's roughness	Hyd	The numerical representation of the hydraulic roughness of a conduit, flow path or channel as used in the Manning's formula.
Manning's roughness coefficient	Hyd	<p>A dimensionless parameter (n) used in the Manning's formula that defines channel or conduit roughness—that being a combination of both form and surface roughness.</p> <p>The coefficient is assumed to be dimensionless thus allowing the same coefficient to be used in both the SI (metric) and English unit versions of the formula.</p>
Masonry dam	Eng	A dam constructed mainly of stone, brick or concrete blocks jointed with mortar.
Mass movement	Sol	<p>The erosion process in which gravity is the primary force acting to dislodge and transport land surface materials. Mass movement depends upon the interaction of various factors including landform, lithology, soil type, rainfall intensity and duration, drainage characteristics, vegetal over, and human intervention.</p> <p>Types of mass movement include earthflows, landslides and landslips.</p>
Master Drainage Plan	Sto	<p>A plan that formulates the proposed management of urban stormwater runoff for a particular project or drainage area.</p> <p>A master drainage plan typically addresses issues such as infiltration and runoff characteristics, flow paths of major overland flow paths and concentrated flow, location and size of stormwater drainage components such as detention/retention systems and stormwater quality improvements structures.</p>
Mat (geotextile)	Eng	A geotextile made of coarse filaments joined in a tortuous shape and bonded at their intersections to form an open structure 10 to 20mm thick.
Matrix gravel	Wwy	Riverbed gravel supported by a matrix of sand or sediment.
Maximum acceptable toxicant concentration (MATC)	Eco	The concentration of a toxic substance that may be present in a receiving water without causing significant harm to its productivity or uses as determined by chronic toxicity tests.

Maximum permitted outflow	Sto	The design maximum discharge from an attenuation-control device or from a development site.
Mean annual runoff	Hyd	The average annual runoff from a catchment.
Mean High Water Neaps (MHWN)	Coa	The long-term average of the heights of two successive high tides when the range of tide is the least, at the time of the first and last quarter of the moon.
Mean High Water Spring (MHWS)	Coa	The long-term average of the heights of two successive high tides when the range of tide is greatest, at full moon and new moon.
Mean Low Water Neaps (MLWN)	Coa	The long-term average of the heights of two successive low tides when the range of tide is the least, at the time of the first and last quarter of the moon.
Mean Low Water Springs (MLWS)	Coa	The long-term average of the heights of two successive low tides when the range of tide is greatest, at full moon and new moon.
Mean Sea Level (MSL)	Coa	The average level of the sea over a long period.
Meandering channel	Wwy	A stream channel characterised by a series of alternating bends (meanders) caused by erosion.
Measured flow-through test	Eco	A toxicity test for a constant flow or continuous flow of water where the concentration of the substance in the water is measured.
Media		See FILTER MEDIA.
Median diameter	Sol	The diameter (d_{50}) corresponding to the 50 per cent finer by weight (or by volume) in the size distribution curve known as the gradation curve.
Median effective concentration (EC_{50})	Eco	The concentration of material in water to which test organisms are exposed that is estimated to be effective in producing some lethal response in 50% of the test organisms. The LC_{50} is usually expressed as a time-dependent value (e.g. 24-hour or 96-hour LC_{50}).
Median lethal concentration (LC_{50})	Eco	The concentration of material in water to which test organisms are exposed that is estimated to be lethal to 50 per cent of the test organisms. The LC_{50} is usually expressed as a time-dependent value (e.g. 24-hour or 96-hour LC_{50} ; the concentration estimated to be lethal to 50 per cent of the test organisms after 24 or 96 hours of exposure).
Median lethal dose (LD_{50})	Eco	The dose of material that is estimated to be lethal to 50 per cent of the test organisms. Appropriate for use with test animals such as rats, mice and dogs. It is rarely applicable to aquatic organisms because it indicates the quantity of a material introduced directly into the body by injection or ingestion rather than the concentration of the material in water in which aquatic organisms are exposed during toxicity tests.

Median tolerance limit (TL _m or TL ₅₀)	Eco	<p>The concentration of material in water at which 50 per cent of the test organisms survive after a specified time of exposure. The TL₅₀ (equivalent to the TL_m) is usually expressed as a time dependent value (e.g. 24-hour or 96hour TL₅₀; the estimated concentration at which 50 per cent of the test organisms survive after 24 or 96 hours of exposure).</p> <p>Unlike lethal concentration and lethal dose, the term 'tolerance limit' is applicable in designating a level of any measurable lethal condition (e.g. extremes in pH, temperature, dissolved oxygen). TL_m and TL₅₀ have been replaced by median lethal concentration (LC₅₀) and median effective concentration (EC₅₀).</p>
Medium		See Filter medium.
Mesotrophic	Eco	Relating to organisms providing a moderate amount of nutrition.
Metabolism	Eco	The sum of all chemical processes occurring in an organism or a single cell by which food is built up (anabolism) into living protoplasm and by which protoplasm is broken down (catabolism) into simpler compounds with the exchange of energy.
Metabolite	Eco	Any product of metabolism.
Metals	Sto	<p>Any class of elementary substances which are crystalline when solid, or an alloy composed of such substance.</p> <p>Metals of particular interest include copper (Cu), lead (Pb), zinc (Zn), cadmium (Cd), arsenic (As), nickel (Ni), chromium (Cr), mercury (Hg), selenium (Se), and silver (Ag).</p>
Meteorological data	Gen	Data relating to past, current or predicted weather conditions.
Meteorological tide	Coa	<p>An atmospherically driven rise in sea level caused by extreme surface winds and low atmospheric pressure associated with severe weather conditions, usually cyclones.</p> <p>Also known as a STORM SURGE.</p>
Meteorology	Gen	The science dealing with the atmosphere and its phenomena, especially weather.
Microbial processes	Eco	The processes that are undertaken by microorganisms.
Micrograzer	Eco	An organism feeding on small particles of food.
Microhabitats	Eco	Small components of the environment which are used by animals for shelter, nesting, food gathering, and so on.
Microorganisms	Eco	Microscopic fauna and flora, e.g. bacteria, fungi and algae.
Mineralise	Gen	To convert to a mineral substance, or impregnate with mineral material.
Mini wetland	Sto	<p>A small, usually ephemeral wetland, often located adjacent to stormwater outlets or in association with a landscaped area specifically constructed to provide stormwater quality benefits.</p> <p>They may or may not incorporate stormwater retention and usually do not rely on sub-surface filtration due to the typical long-term saturation of the clayey soil bed.</p>

Minimum energy loss culvert	Hyd	<p>A culvert designed to minimise hydraulic energy losses for the water passing through the culvert.</p> <p>The design of a minimum energy loss culvert is associated with the concept of constant total head. The inlet and outlet must be streamlined in such a way that significant form losses are avoided.</p>
Minimum energy structure	Hyd	<p>A hydraulic structure designed to yield critical flow at all points for a particular discharge. At discharges greater than the design discharge choking will probably occur at the throat or barrel.</p> <p>Also known as a CRITICAL ENERGY STRUCTURE or CRITICAL FLOW STRUCTURE.</p>
Minor design storm	Sto	The rainfall event for the ARI chosen for the design of the Minor Drainage System.
Minor drainage system	Sto	<p>The portion of the total drainage system that collects, stores and conveys stormwater runoff from those frequently occurring storms with a duration, volume and average intensity less than that of the designated minor design storm.</p> <p>The minor drainage system comprises most roadside drainage systems, roof water drainage systems, pipe drainage systems and those drainage systems primarily constructed for the purpose of providing pedestrian safety and convenience, and vehicle access.</p>
Minor GPT	—	See MINOR GROSS POLLUTANT TRAP.
Minor gross pollutant trap	Sto	<p>An in-ground, enclosed, combined sediment sump and trash rack usually located at the downstream end of a stormwater pipe network. Primarily designed to trap coarse pollutants such as litter, organic debris and coarse sediment.</p> <p>Also known as an ENCLOSED GPT.</p>
Minor road	Eng	A road that provides access to abutting allotments, such as residential streets.
Minor storm	Sto	A storm with both a duration and average intensity less than that of the designated minor design storm for a given stormwater system or location.
Minor system	Sto	See MINOR DRAINAGE SYSTEM.
Missouri charts	Hyd	Design charts providing pressure changes coefficients at storm drain junctions, developed by the University of Missouri.
Mitigation	Gen	The act of lessening the force, severity or risk of an event such as a flood risk.
Mitre drain	Sto	A drain constructed at an angle to its outlet channel, e.g. the drainage of a road shoulder to a disposal area from the road alignment.
Mixing zone	Sto	An area or volume of a receiving water where water released from a system mixes with the receiving waters primarily as a result of the momentum of the released water and the natural turbulence of the receiving water flow.
Mobility	Eco	The ability of small particles and substances to move, either by random motion or under the influence of fields or forces.

Model	Hyd	A numerical or physical simulation of a system, event or condition, e.g. a model of a river flood. Physical models may be larger or smaller than, or the same size as the modelled system.
Model calibration	Hyd	The process by which the independent variables of a numerical computer model are varied in order to calibrate a dependent variable against a known value.
Model verification	Hyd	The process by which a calibrated numerical computer model is tested to see if it can generate a known response from a given set of input data.
Moderate rainfall	Hyd	<p>Rainfall with:</p> <ul style="list-style-type: none"> (i) an intensity equal to, or greater than, 2mm/hr but less than 10mm/hr; or (ii) a total rainfall depth equal to, or greater than, the equivalent of the one hour duration, 1 in 1 year ARI design storm rainfall depth over a 24-hour period, but less than the equivalent of the one hour duration, 1 in 2 year ARI design storm rainfall depth over a 24-hour period. <p>For example, if the 1 hour duration, 1 in 1yr and 1 in 2yr ARI average rainfall intensity at a given location is 36mm/hr and 47mm/hr respectively, then heavy rainfall would be a rainfall depth of 36 to 47mm within any 24-hour period, or an intensity between 2 and 10mm/hr at any given time.</p>
Modified aquatic ecosystem	Eco	An aquatic ecosystem that is, or has been, subject to human interference through releases—whether direct or indirect—into a water body forming part of the ecosystem, or activities in the water's catchment area.
Modified compaction	Eng	The soil compaction (density) achieved in a modified compaction test.
Modified compaction test	Eng	A standardised soil test used to determine dry soil density achieved when a soil is compacted under controlled conditions at a given moisture content. The test consists of placing a layer of a given soil in a 101mm diameter by 152mm high cylinder and compacting by dropping a 4.54kg weight 25 times through a height of 457mm onto the soil. Four additional layers are then placed in the same way.
Modified Rational Method	Hyd	A modification to the traditional Rational Method that allows the estimation of discharge hydrographs based on a defined hydrograph shape (i.e. triangular or trapezoidal), peak discharge and some adjustment to runoff volume. (The method is more commonly used in the USA).
Modular pavement	Eng	A pavement consisting of strong structural materials with regularly interspersed void areas that are filled with pervious materials such as sand, gravel, or sod. Typically used in low-volume traffic areas e.g. the outer parts of a parking lot or in parking lots serving parks or recreational areas.
Monitor	Gen	To check, supervise, observe critically or measure the progress of an activity, action or system on a regular basis in order to identify change from the performance level required or expected.
Monomeric	Eco	A chemical compound comprising single molecules.

Mountable kerb	Eng	A kerb designed so that it can be mounted without damage to a vehicle.
Mud	Gen	Wet, soft earth or earthy matter, e.g. the ground after rain, or at the bottom of a pond.
Mulch (noun)	Esc	A natural or artificial layer of plant residue (e.g. straw) or other material (e.g. rock) used to cover the ground surfaces. Mulch is usually used to conserve soil moisture, help establish plant cover, and protect soil from raindrop impact erosion and minor surface flows.
Mulch (verb)	Esc	To cover ground surfaces with mulch.
Multi-period storm	Hyd	A storm that has more than one period of rainfall excess. The duration of each period is equal to the specified time period.
Multiple use	Gen	Relating to facilities that fulfil a range of functions.
Multiple-purpose stormwater facility	Sto	An urban stormwater facility that fulfils multiple functions (e.g. enhancement of runoff quality, erosion control, wildlife habitat, or public recreation) in addition to its primary goal of conveying or controlling runoff.
Multi-variate	Eco	A type of statistical analysis concerned with data collected on several dimensions of the same organism.
Munsell Scale	Sol	A system of reporting soil colour that is based on three established colour variables: hue, value and chroma.
Muskingum method	Hyd	A commonly used hydrologic routing method that is based upon a variable discharge–storage relationship. Storage volume within the channel is represented by a combination of wedge and prism storage. The assumed shape of the instream storage varies between the rising limb and falling limb of the flood wave.
Mutagenesis	Eco	The process of alteration of the genetic material of a cell in such a manner that the alteration is transmitted to subsequent generations of cells.