

WSUD Glossary

Activated sludge process

An activated sludge process involves using naturally occurring micro-organisms to feed on the organic material in the sewage. Activated sludge is a rich mixture of bacteria and minerals. The process is used in sewage treatment plants to break down organic matter and nitrogen compounds. (Source MW).

Advanced sedimentation systems

Advanced sedimentation systems are devices that encourage physical separation such as clarifiers and can be incorporated into water treatment processes. They are typically a combination of mechanical and physical designs enhancing sedimentation.

Afforestation

Afforestation is achieved by planting trees or their seeds that convert open land into a forest. Afforestation can be carried out for a number of reasons including the creation of new forest habitats, as commercial forestry, or to create a carbon sink for the purposes of providing carbon offsetting activity.

Aerobic treatment

Biological process by which microbes decompose complex organic compounds in the presence of oxygen and use the liberated energy for reproduction and growth.

Algae

Algae are simple photosynthetic plants that live in water or moist places. (Source MW).

Anaerobic treatment

Reduction of the net energy level and change in chemical composition of organic matter caused by micro-organisms in an oxygen-free environment.

Algal Bloom

An algal bloom is a rapid increase in the mass of one or more algae, usually caused by a change in the flow, light, temperature or nutrient levels of the water in which it lives. (Source MW).

Biofilm

A biofilm is a concentration of micro-organisms on a surface that removes dissolved organic matter from water.

Bioretention systems

These are another name for raingardens.

Biological treatment

Biological treatment involves using natural processes to breakdown high nutrient and organic loading in water. There are two types of systems – fixed and suspended. Fixed growth refers to systems where micro-organisms are attached to a surface that is exposed to water. Suspended growth systems are where micro-organisms are freely suspended in water.

Biological uptake

Biological uptake is the transfer of a substance (typically nutrients) from water or soil to a living organism such as plants or micro-organisms (a biofilm).

Biological oxygen demand

Biological oxygen demand (BOD) is the decrease in oxygen content in a sample of water that is brought about by the bacterial breakdown of organic matter in the water. It is used as a water quality indicator.

Blackwater

Blackwater is wastewater that comes from a toilet or kitchen sink which is high in BOD, solids and oils and requires significant treatment.

Blue-green algae

Blue-green algae, or cyanobacteria, is one form of algae (see separate listing). Blooms of blue-green algae have occurred in some important Australian waterways during drought or because of severe pollution. (Source MW).

Buffer strip

Buffer strips are strips of vegetation planted to provide discontinuity between impervious surfaces and the drainage system.

Catchment

An area of land which drains all run-off water to the same lowest point such as a waterway.

City as a catchment

City as a Catchment' describes a catchment based approach to urban areas. The approach aims to sustainably manage the urban water cycle to minimise mains water consumption, reduce wastewater generation and lessen the impact of stormwater discharges on receiving waters.

Chlorination

Chlorination is a disinfection method used to kill pathogens using chlorine.

Climate sensitive

Carbon sensitive is used to mean that the greenhouse gas emissions from energy use, biodegradation processes and embodied energy emissions of equipment have been measured, reduced and offset over the operation of a water saving scheme.

Hence, although not all emissions associated with the water saving scheme have been neutralised, the additional emissions from the main sources have been reduced and offset.

Demand management

Demand management is an approach to reducing the consumption of water by reducing demand for it. Demand management includes educating people about how to save water, promoting the use of household and industrial appliances that use water more economically, such as dual-flush toilets, and putting a price on water that reminds people of its true value. (Source MW).

Desalination

Removal of salts from seawater or other saline (salty) solutions.

Detention time

Detention time is the time it takes for water to flow from the inlet to the outlet. Detention time is never a constant.

Dissolved air flotation

Dissolved air flotation (DAF) is a water treatment process that clarifies water by the removal of suspended matter such as oil or solids. The removal is achieved by dissolving air in the water under pressure and then releasing the air at atmospheric pressure in a flotation tank or basin. The released air forms tiny bubbles which adhere to the suspended matter causing the suspended matter to float to the surface of the water where it may then be removed by a skimming device.

E. Coli

E. Coli is a faecal bacteria found in the digestive tract of animals, which are used to indicate presence of wastewater contamination within an environment.

Embodied energy

Embodied energy is the energy consumed by all the processes associated with the production of a product or material, from the acquisition of natural resources to product delivery.

Greenhouse gas emissions

Greenhouse gas emissions are gases emitted from the wastewater processes (methane) and the running of equipment that uses electricity to maintain a water project.

Hydraulic loading

Hydraulic loading is the flow of water to a treatment system. This is measured as the design flow divided by the plan area of the treatment measure and can be used to provide an indicative land requirement for a given treatment flow.

Hydrocyclone

Hydrocyclone is a device to clarify/separate or sort particles in a liquid suspension based on the specific gravity of the particles.

Greywater

Greywater is wastewater from the laundry and bathroom (but not the toilet). It usually contains soap, detergents and lint.

Gross pollutant trap

A gross pollutant trap (GPT) is a structure used to trap large pieces of debris (>5mm) transported through the stormwater system.

Life cycle assessment

Life-cycle assessments (LCAs) involve cradle-to-grave analyses of production systems or processes.

Life cycle costing

Life Cycle Costing (LCC) is a technique to establish the total cost of a project or service. It is a structured approach that addresses all the elements of this cost and can be used to produce a spend profile of the product or service over its anticipated life-span. The results of an LCC analysis can be used to assist management in the decision-making process where there is a choice of options.

Land capability assessment

A land capability assessment is a survey that assesses the capability of a site to sustainably manage the health and environmental impacts of external stressors such as recycled water use. It looks at the distribution of land, contours or slope degree and direction, vegetation, water bodies including dams, drains, creeks, drainage depressions (transient wetlands) and bores.

Macrophyte

A macrophyte is a type of vegetation such as reeds used in surface wetlands. They are plants that grow in waterlogged conditions.

Mediafiltration

Mediafiltration is a physical treatment process that typically occurs after the secondary biological process. There are two major types of filters – sand and depth. Depth filters are a variation on a sand filter where a specified media is used to filter water. Typically there are more layers in a depth system.

Membrane bioreactor

A membrane bioreactor combines the process of a biological reactor, typically activated sludge, and a membrane filter system into one process.

Membrane filtration

Membrane filtration is a physical separation process to filter pollutants using a semi-permeable media. Water is passed through a membrane under pressure, it 'squeezes' through the structure. The membrane selectively traps larger pollutants. There are four classes of filter in order of particle size (micro, ultra, nano and reverse osmosis).

MUSIC

MUSIC is the acronym used for the Model for Urban Stormwater Improvement Conceptualisation software developed by the Cooperative Research Centre for Catchment Hydrology to model urban stormwater management schemes.

Nutrients

Nutrients are organic substances such as nitrogen or phosphorous in a water.

Ozonation

Ozonation is a powerful oxidising agent created by an electrical discharge in a gas containing oxygen. It is a treatment technique used to kill micro-organisms and pathogens in wastewater.

Pond

Ponds and lakes are artificial bodies of open water usually formed by a simple dam wall with a weir outlet structure. Typically the water depth is greater than 1.5m.

Potable water

Potable water is water suitable for drinking or ingestion purposes. It is assigned as potable on the basis of water quality standards. It is provided to householders through a reticulated (piped) water distribution network.

Process energy requirement

Process Energy Requirement is the energy directly related to the manufacture of a material.

Raingarden

Raingardens are constructed vegetation systems that filter polluted stormwater through a vegetated filter media layer. Water is treated, purified and released so it can flow downstream into waterways or into storage for reuse. Raingardens can often provide a habitat for flora and fauna.

Raingardens are also referred to as bioretention systems.

Rain water

Rainwater includes roof runoff and is generally stored in a rainwater tank.

Rainwater tank

A rainwater tank is used to collect and store rainfall from household roofs for reuse to provide a resource of non-potable water. They are of varying sizes and materials.

Reclaimed water

Reclaimed water is often used to define water recycled from treated sewage.

Recycled water

Recycled water is taken from any waste (effluent) stream and treated to a level suitable for further use, where it is used safely and sustainably for beneficial purposes. This is a general term that can include reclaimed water.

Recirculating media filters

Recirculating media filters (RMF) are made of two types – recirculating textile filters and recirculating sand filters. These are biological treatment processes removing organic material from wastewater. Textile filters are available in small compact package plants suitable for decentralised treatment.

Reforestation

Reforestation involves replanting an area with forest cover.

Reverse osmosis

Reverse osmosis (RO) is the finest membrane filtration process with the smallest pore size (estimated to be around 4-8 angstroms, or about the size of a molecule). RO has a high pressure requirement and therefore a high energy requirement too. RO can remove pathogens, viruses and salts.

Risk assessment

A risk assessment is the overall process of using available information to predict how often hazards or specified events may occur (likelihood) and the magnitude of their consequences (adapted from AS/NZS 4360:1999).

Rotating biological reactor

A rotating biological reactor is a type of biological treatment system that uses rotating discs to support active micro-organism growth which removes dissolved and organic matter from water.

Sedimentation

Sedimentation is a primary treatment process that removes pollutants through gravity settling. Sedimentation occurs at reduced flow velocities and thereby causes particles to settle. Sedimentation can occur in basins, tanks, ponds and wetlands.

Sand filtration

Sand filtration is an aerobic process where water percolates through sand. The principle removal mechanism is by straining where particles larger than the sand pore space are trapped.

Sedimentation basins

Sediment basins are used to retain coarse sediments from runoff. They are typically incorporated into pond or wetland designs.

Sequencing batch reactor

A sequencing batch reactor (SBR) is an activated sludge process where all the main treatment steps occur in the same reactor, including filling with influent, reaction, settling, drawing and decanting.

Sewage

Sewage (also called 'wastewater') is the human waste material that passes through a sewerage system. Sewage is much more than what gets flushed down the toilet. It also includes everything that goes down the kitchen, laundry and bathroom sinks as well as trade waste from industrial and commercial premises.

Sewerage system

Sewerage is the system of pipes and pumps that transport wastewater.

Water mining (or sewer mining)

Water mining or sewer mining is the process of extracting sewage from a sewerage system and treating it to produce recycled water for a specific end use.

Storm water

Stormwater is rainfall runoff from all types of surfaces. Stormwater is generated predominately in urban catchments from impervious surfaces such as like roads and pavements.

Suspended solids

Suspended solids refer to small solid particles which remain in suspension in water as a colloid or due to the motion of the water. It is used as one indicator of water quality. Particles can be removed by sedimentation or filtration.

Swale

A swale is a vegetated open channel designed to intercept and convey surface stormwater runoff, promote infiltration, and intercept sediment by the vegetation. It provides a landscape feature in urban areas.

Tertiary treatment

Tertiary treatment includes treatment processes beyond secondary or biological processes which further improve effluent quality. They are usually disinfection processes, sand filtration or membrane filtration.

Treatment train

The treatment train is a series of treatment measures to provide an overall approach to the removal of pollutants from water.

Trickle filter

A trickle filter is an aerobic fixed film biological reactor where water trickles over a bed of media to which the micro-organisms are attached (a biofilm).

UV disinfection

UV disinfection uses UV light to deactivate micro-organisms in water. The short UV wavelength destroys the genetic material of cells and stops it reproducing. UV has a low capital and operating costs and is well suited to small-scale water treatment processes.

Water balance

A water balance is a mass balance accounting for water entering, accumulating and exiting a system. It includes rainwater, potable mains water, evapotranspiration and infiltration, wastewater and stormwater.

Wastewater

Wastewater is water which has been used for specific purpose and is no longer required or suitable for that purpose.

Water sensitive urban design

WSUD embraces a range of measures that are designed to avoid, or at least minimise, the environmental impacts of urbanisation. WSUD recognises all water streams in the urban water cycle as a resource. Rainwater (collected from the roof), stormwater (collected from all impervious surfaces), potable mains water (drinking water), greywater (water from the bathroom taps, shower, and laundry) and blackwater (toilet and kitchen) possess an inherent value.

Water reuse

Water reuse is the beneficial use of recycled water that has been treated for reuse on a site.

Wetland

A wetland is transitional area between land and water systems which is either permanently or periodically inundated with shallow water. Surface wetlands use enhanced sedimentation, fine filtration and biological uptake processes to remove pollutants from water. Subsurface wetlands are a complex assemblage of water, soils, microbes, plants, organic debris and invertebrates where water flows through the soil. The soil is highly permeable and contains gravel and coarse sand.